Application: 25-05-
(U 39 M)
Exhibit No.: (PG&E-5)
Date: May 15, 2025
Witness(es): Various

PACIFIC GAS AND ELECTRIC COMPANY

2027 GENERAL RATE CASE

EXHIBIT (PG&E-5)

ENERGY SUPPLY

WORKPAPERS SUPPORTING

PREPARED TESTIMONY CHAPTERS 1-3

VOLUME 1 OF 2

(PUBLIC)

PACIFIC GAS AND ELECTRIC COMPANY
2027 GENERAL RATE CASE
EXHIBIT (PG&E-5) ENERGY SUPPLY

WORKPAPERS SUPPORTING
CHAPTER 1, ENERGY SUPPLY POLICY AND SUMMARY OF EXHIBIT

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Expense Workpapers	
Expenses by Major Work Category (Nominal Dollars)	WP 1-1
Expenses by Major Work Category (Base Year Dollars)	WP 1-2

Table 1-1
Pacific Gas and Electric Company
2027 General Rate Case
Exhibit (PG&E-5), Chapter 1
Energy Supply Policy and Summary of Exhibit
Expenses by Major Work Category
(Thousands of Nominal Dollars)

Line No.	MWC	Description	2020 Recorded Adjusted	2021 Recorded Adjusted	2022 Recorded Adjusted	2023 Recorded Adjusted	2024 Recorded Adjusted	2025 Forecast	2026 Forecast	2027 Forecast	Reference (A)
1	AB	Misc Expense								(24,000)	
2	**Total**									**(24,000)**	

Table 1-2
Pacific Gas and Electric Company
2027 General Rate Case
Exhibit (PG&E-5), Chapter 1
Energy Supply Policy and Summary of Exhibit
Expenses by Major Work Category
(Thousands of Base Year Dollars)

Line No.	MWC	Description	2020 Recorded Adjusted	2021 Recorded Adjusted	2022 Recorded Adjusted	2023 Recorded Adjusted	2024 Recorded Adjusted	2025 Forecast	2026 Forecast	2027 Forecast
1	AB	Misc Expense								(22,572)
2	**Total**									**(22,572)**

PACIFIC GAS AND ELECTRIC COMPANY
2027 GENERAL RATE CASE
EXHIBIT (PG&E-5), ENERGY SUPPLY

WORKPAPERS SUPPORTING
CHAPTER 2, ENERGY SUPPLY RISK MANAGEMENT

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2027 GRC: Recorded and Forecast Costs and CBRs

Table No.	Risk ID	Risk Name	Risk Programs	Cost Type	Workpaper No.
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Workpaper Table 2-6	GSHUT	Extended Unplanned Shutdown of a Critical Power Generation Asset	Controls	Expense	WP 2-6
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2024 RAMP to 2027 GRC Comparison: Recorded and Forecast Costs and CBRs

Table No.	Risk ID	Risk Name	Risk Programs	Cost Type	Workpaper No.
Workpaper Table 2-9	LGUWR	Large Uncontrolled Water Release	Controls	Capital and Expense	WP 2-9
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Workpaper Table 2-1
Pacific Gas and Electric Company
2027 General Rate Case
Exhibit (PG&E-5), Chapter 2, Energy Supply Risk Management
Risk Mitigation and Control Costs - Forecast by Chapter
(Thousands of Nominal Dollars)

Column			A	B	C	D
			RISK MITIGATIONS		**RISK MITIGATIONS**	
			EXPENSE: 2027-2030 Forecast by Risk ($000s) (1)		**CAPITAL: 2027-2030 Forecast by Risk ($000s) (1)**	
Line No.	**Ch No.**	**Chapter**	Large Uncontrolled Water Release	Extended Unplanned Shutdown of a Critical Power Generation Asset	Large Uncontrolled Water Release	Extended Unplanned Shutdown of a Critical Power Generation Asset
1	**3**	Hydro Operations Costs	$ 571	$ 18,468	$ 885,320	$ 838,722
2	**4**	Natural Gas, Solar, and Energy Storage	$ -	$ 47,562	$ -	$ 84,239
3		**Total**	**$ 571**	**$ 66,029**	**$ 885,320**	**$ 922,961**

			RISK CONTROLS		**RISK CONTROLS**	
			EXPENSE: 2027-2030 Forecast by Risk ($000s) (1)		**CAPITAL: 2027-2030 Forecast by Risk ($000s) (1)**	
	Ch No.	**Chapter**	Large Uncontrolled Water Release	Extended Unplanned Shutdown of a Critical Power Generation Asset	Large Uncontrolled Water Release	Extended Unplanned Shutdown of a Critical Power Generation Asset
4	**3**	Hydro Operations Costs	$ 114,188	$ 202,821	$ 2,162	$ -
5	**4**	Natural Gas, Solar, and Energy Storage	$ -	$ 117,644	$ -	$ -
6		**Total**	**$ 114,188**	**$ 320,465**	**$ 2,162**	**$ -**

Notes:
(1) The expense and capital forecast by risk represent the amounts included in PG&E's enterprise risk models for calculating a Cost-Benefit Ratio (CBR). In certain cases, forecast costs for the same work are included in more than one risk model. Even though the forecast amounts are used more than once in the risk models, PG&E is only requesting recovery for these costs one time.

Workpaper Table 2-2
Pacific Gas and Electric Company
2027 General Rate Case
Exhibit (PG&E-5), Chapter 2, Energy Supply Risk Management
Large Uncontrolled Water Release - Recorded and Forecast Control Costs - Capital

Line No.	Risk Program ID	Risk Program Name	Chapter	MWC	NOMINAL DOLLARS 2024	2025	2026	2027	2028	2029	2030	Total (2024-2030)	Total (2027-2030)	MILLIONS OF DOLLARS (NPV) [1] Program Cost (2027-2030) [A]	Foundational Activity Cost [B]	Risk Reduction [C]	CBR [2], [3], [4] [C]/([A]+[B])
1	LGUWR-C001	C1 - Maintenance	3	2N	$ 212,328	$ 300,000	$ 341,596	$ 460,437	$ 488,464	$ 609,178	$ 603,720	$ 3,015,724	$ 2,161,799	$ 77	$ 20	$ 35	0.4
2		**Total**			**$ 212,328**	**$ 300,000**	**$ 341,596**	**$ 460,437**	**$ 488,464**	**$ 609,178**	**$ 603,720**	**$ 3,015,724**	**$ 2,161,799**				
3		Total Chapter 3			$ 212,328	$ 300,000	$ 341,596	$ 460,437	$ 488,464	$ 609,178	$ 603,720	$ 3,015,724	$ 2,161,799				
4		**Total**			**$ 212,328**	**$ 300,000**	**$ 341,596**	**$ 460,437**	**$ 488,464**	**$ 609,178**	**$ 603,720**	**$ 3,015,724**	**$ 2,161,799**				
5	Notes:																
6	(1) NPV uses a base year of 2024.																
7	(2) CBR calculations include allocated Foundational Activity program costs.																
8	(3) CBRs for mitigation or controls associated with more than one major work category (MWC) or maintenance activity type (MAT) are listed only once, the first time they appear on this schedule.																
9	(4) **Step 3 Exempt** indicates this program is exempt from Step 3 Supplemental Analysis in the GRC and does not require a CBR to be calculated. For additional information on Step 3 Supplemental Analysis, See D.22-12-027, Appendix A, p. A-17, No. 28.																

Workpaper Table 2-3
Pacific Gas and Electric Company
2027 General Rate Case
Exhibit (PG&E-5), Chapter 2, Energy Supply Risk Management
Large Uncontrolled Water Release - Recorded and Forecast Control Costs - Expense

Line No.	Risk Program ID	Risk Program Name	Chapter	MWC	NOMINAL DOLLARS 2024	2025	2026	2027	2028	2029	2030	Total (2024-2030)	Total (2027-2030)	MILLIONS OF DOLLARS (NPV) [1] Program Cost (2027-2030) [A]	Foundational Activity Cost [B]	Risk Reduction [C]	CBR [2], [3], [4] [C]/([A]+[B])
1	LGUWR-C001	C1 - Maintenance [5]	3	AX	$ 15,675,108	$ 13,782,028	$ 14,105,906	$ 25,966,228	$ 28,429,384	$ 29,216,878	$ 30,288,330	$ 157,463,862	$ 113,900,820	$ 77	$ 20	$ 35	0.4
2	LGUWR-C001	C1 - Maintenance	3	IG	$ 1,773,003	$ 2,871,826	$ 1,350,000	$ 272,427	$ 15,000	$ -	$ -	$ 6,282,256	$ 287,427				
3		**Total**			**$ 17,448,111**	**$ 16,653,854**	**$ 15,455,906**	**$ 26,238,655**	**$ 28,444,384**	**$ 29,216,878**	**$ 30,288,330**	**$ 163,746,118**	**$ 114,188,247**				
4		Total Chapter 3			$ 17,448,111	$ 16,653,854	$ 15,455,906	$ 26,238,655	$ 28,444,384	$ 29,216,878	$ 30,288,330	$ 163,746,118	$ 114,188,247				
5		**Total**			**$ 17,448,111**	**$ 16,653,854**	**$ 15,455,906**	**$ 26,238,655**	**$ 28,444,384**	**$ 29,216,878**	**$ 30,288,330**	**$ 163,746,118**	**$ 114,188,247**				

6 Notes:
7 (1) NPV uses a base year of 2024.
8 (2) CBR calculations include allocated Foundational Activity program costs.
9 (3) CBRs for mitigation or controls associated with more than one major work category (MWC) or maintenance activity type (MAT) are listed only once, the first time they appear on this schedule.
10 (4) **Step 3 Exempt** indicates this program is exempt from Step 3 Supplemental Analysis in the GRC and does not require a CBR to be calculated. For additional information on Step 3 Supplemental Analysis, See D.22-12-027, Appendix A, p. A-17, No. 28.
11 (5) There are minor inconsistencies between the cost forecast shown here and the cost forecast used to compute the Cost-Benefit Ratio (CBR). These inconsistencies will be corrected in an errata filing.

Workpaper Table 2-4
Pacific Gas and Electric Company
2027 General Rate Case
Exhibit (PG&E-5), Chapter 2, Energy Supply Risk Management
Large Uncontrolled Water Release - Recorded and Forecast Mitigation Costs - Capital

Line No.	Risk Program ID	Risk Program Name	Chapter	MWC	NOMINAL DOLLARS 2024	2025	2026	2027	2028	2029	2030	Total (2024-2030)	Total (2027-2030)	MILLIONS OF DOLLARS (NPV) [1] Program Cost (2027-2030) [A]	Foundational Activity Cost [B]	Risk Reduction [C]	CBR [2], [3], [4] [C]/([A]+[B])
1	LGUWR-M001	M1 - Internal Erosion Mitigation	3	2L	$ 41,176,302	$ 49,134,857	$ 32,342,076	$ 23,140,439	$ 26,152,170	$ 11,109,989	$ -	$ 183,055,833	$ 60,402,598	$ 110	$ 25	$ 41	0.3
2	LGUWR-M001	M1 - Internal Erosion Mitigation	3	2N	$ 8,903,979	$ 3,432,332	$ 3,701,083	$ 4,684,158	$ 18,438,444	$ 20,339,639	$ 19,370,051	$ 78,869,685	$ 62,832,292				
3	LGUWR-M002	M2 - Spillway Remediation	3	2L	$ 43,994	$ 321,193	$ 1,879,790	$ 4,440,724	$ 16,536,334	$ 20,652,784	$ 17,038,386	$ 60,913,205	$ 58,668,228	$ 703	$ 120	$ 890	1.1
4	LGUWR-M002	M2 - Spillway Remediation	3	2M	$ 21,312	$ -	$ 873,778	$ 1,812,258	$ 2,752,428	$ 4,680,861	$ -	$ 10,140,637	$ 9,245,547				
5	LGUWR-M002	M2 - Spillway Remediation	3	2N	$ 13,751,577	$ 29,016,912	$ 23,280,020	$ 7,515,112	$ 10,777,308	$ 7,552,493	$ 6,691,304	$ 98,584,726	$ 32,536,217				
6	LGUWR-M002	M2 - Spillway Remediation	3	3H	$ 21,494,587	$ 28,639,433	$ 37,667,170	$ 64,835,805	$ 151,564,213	$ 146,686,074	$ 136,719,940	$ 587,607,222	$ 499,806,032				
7	LGUWR-M003	M3 - Seismic Retrofit	3	2L	$ 431,633	$ 363,929	$ 1,248,772	$ 5,549,834	$ 14,699	$ -	$ -	$ 7,608,867	$ 5,564,533	$ 30	$ 5	$ 15	0.4
8	LGUWR-M003	M3 - Seismic Retrofit	3	2M	$ -	$ -	$ -	$ -	$ 458,738	$ 780,144	$ 1,405,736	$ 2,644,618	$ 2,644,618				
9	LGUWR-M003	M3 - Seismic Retrofit	3	2N	$ 356,433	$ -	$ 184,035	$ 4,224,660	$ 605,728	$ 1,872,344	$ 9,371,574	$ 16,614,774	$ 16,074,306				
10	LGUWR-M003	M3 - Seismic Retrofit	3	2P	$ -	$ -	$ -	$ -	$ -	$ 104,019	$ 234,289	$ 338,308	$ 338,308				
11	LGUWR-M004	M4 - LLO Refurbishment	3	2L	$ 229,800	$ 560,482	$ 1,686,495	$ 5,650,943	$ -	$ -	$ -	$ 8,127,720	$ 5,650,943	$ 79	$ 15	$ 312	3.3
12	LGUWR-M004	M4 - LLO Refurbishment	3	2M	$ 34,953	$ -	$ 689,441	$ 70,223	$ -	$ -	$ -	$ 794,617	$ 70,223				
13	LGUWR-M004	M4 - LLO Refurbishment	3	2N	$ 24,710,096	$ 23,001,631	$ 16,913,022	$ 21,727,930	$ 24,776,324	$ 18,789,590	$ 3,556,775	$ 133,475,368	$ 68,850,618				
14	LGUWR-M005	M5 - Physical Security	3	2L	$ 13,524	$ -	$ 543,400	$ -	$ -	$ -	$ -	$ 556,923	$ -	$ 57	$ 5	$ 0	0.002
15	LGUWR-M005	M5 - Physical Security [5]	3	2P	$ -	$ -	$ -	$ -	$ -	$ 1,560,287	$ 1,405,736	$ 2,966,023	$ 2,966,023				
16	LGUWR-M005	M5 - Physical Security	3	3H	$ 4,564,812	$ 4,906,683	$ 6,944,396	$ 15,727,841	$ 18,723,258	$ 15,533,142	$ 9,685,178	$ 76,085,311	$ 59,669,420				
17		**Total**			**$ 115,733,002**	**$ 139,377,453**	**$ 127,953,478**	**$ 159,379,924**	**$ 270,799,645**	**$ 249,661,366**	**$ 205,478,969**	**$ 1,268,383,837**	**$ 885,319,905**				
18		Total Chapter 3			$ 115,733,002	$ 139,377,453	$ 127,953,478	$ 159,379,924	$ 270,799,645	$ 249,661,366	$ 205,478,969	$ 1,268,383,837	$ 885,319,905				
19		**Total**			**$ 115,733,002**	**$ 139,377,453**	**$ 127,953,478**	**$ 159,379,924**	**$ 270,799,645**	**$ 249,661,366**	**$ 205,478,969**	**$ 1,268,383,837**	**$ 885,319,905**				

20 Notes:
21 (1) NPV uses a base year of 2024.
22 (2) CBR calculations include allocated Foundational Activity program costs.
23 (3) CBRs for mitigation or controls associated with more than one major work category (MWC) or maintenance activity type (MAT) are listed only once, the first time they appear on this schedule.
24 (4) **Step 3 Exempt** indicates this program is exempt from Step 3 Supplemental Analysis in the GRC and does not require a CBR to be calculated. For additional information on Step 3 Supplemental Analysis, See D.22-12-027, Appendix A, p. A-17, No. 28.
25 (5) There are minor inconsistencies between the cost forecast shown here and the cost forecast used to compute the Cost-Benefit Ratio (CBR). These inconsistencies will be corrected in an errata filing.

Workpaper Table 2-5
Pacific Gas and Electric Company
2027 General Rate Case
Exhibit (PG&E-5), Chapter 2, Energy Supply Risk Management
Large Uncontrolled Water Release - Recorded and Forecast Mitigation Costs - Expense

					NOMINAL DOLLARS								MILLIONS OF DOLLARS (NPV) [1]			
Line No.	Risk Program ID	Risk Program Name	Chapter	MWC	2024	2025	2026	2027	2028	2029	2030	Total (2024-2030)	Total (2027-2030)	Program Cost (2027-2030) [A]	Foundational Activity Cost [B]	Risk Reduction [C]	CBR [2], [3], [4] [C]/([A]+[B])
1	LGUWR-M002	M2 - Spillway Remediation [5]	3	AX	$ -	$ -	$ -	$ 156,000	$ 415,000	$ -	$ -	$ 571,000	$ 571,000	$ 703	$ 120	$ 890	1.1
2		**Total**			**$ -**	**$ -**	**$ -**	**$ 156,000**	**$ 415,000**	**$ -**	**$ -**	**$ 571,000**	**$ 571,000**				
3		Total Chapter 3			$ -	$ -	$ -	$ 156,000	$ 415,000	$ -	$ -	$ 571,000	$ 571,000				
4		**Total**			**$ -**	**$ -**	**$ -**	**$ 156,000**	**$ 415,000**	**$ -**	**$ -**	**$ 571,000**	**$ 571,000**				
5	Notes:																
6	(1) NPV uses a base year of 2024.																
7	(2) CBR calculations include allocated Foundational Activity program costs.																
8	(3) CBRs for mitigation or controls associated with more than one major work category (MWC) or maintenance activity type (MAT) are listed only once, the first time they appear on this schedule.																
9	(4) **Step 3 Exempt** indicates this program is exempt from Step 3 Supplemental Analysis in the GRC and does not require a CBR to be calculated. For additional information on Step 3 Supplemental Analysis, See D.22-12-027, Appendix A, p. A-17, No. 28.																
10	(5) There are minor inconsistencies between the cost forecast shown here and the cost forecast used to compute the Cost-Benefit Ratio (CBR). These inconsistencies will be corrected in an errata filing.																

Workpaper Table 2-6
Pacific Gas and Electric Company
2027 General Rate Case
Exhibit (PG&E-5), Chapter 2, Energy Supply Risk Management
Extended Unplanned Shutdown of a Critical Power Generation Asset - Recorded and Forecast Control Costs - Expense

Line No.	Risk Program ID	Risk Program Name	Chapter	MWC	NOMINAL DOLLARS 2024	2025	2026	2027	2028	2029	2030	Total (2024-2030)	Total (2027-2030)	MILLIONS OF DOLLARS (NPV) [1] Program Cost (2027-2030) [A]	Foundational Activity Cost [B]	Risk Reduction [C]	CBR [2], [3], [4] [C]/([A]+[B])
1	GSHUT-C001	C1 - Administrative Controls	3	AB	$ 271,191	$ 159,999	$ 163,760	$ 167,608	$ 172,234	$ 177,005	$ 181,961	$ 1,293,760	$ 698,809				N/A
2	GSHUT-C001	C1 - Administrative Controls	3	KG	$ 1,357,293	$ 720,000	$ 736,920	$ 1,032,966	$ 1,107,682	$ 1,138,365	$ 1,170,239	$ 7,263,465	$ 4,449,252				
3	GSHUT-C001	C1 - Administrative Controls	3	KH	$ 496,454	$ 504,050	$ 515,895	$ 530,000	$ 334,438	$ 343,702	$ 353,326	$ 3,077,865	$ 1,561,465				
4	GSHUT-C002	C2 - Ancillary Support to Operate & Maintain Plants	3	KG	$ 2,210,222	$ 2,244,038	$ 2,296,773	$ 2,361,000	$ 2,080,476	$ 2,138,105	$ 2,197,972	$ 15,528,584	$ 8,777,552				N/A
5	GSHUT-C002	C2 - Ancillary Support to Operate & Maintain Plants	3	KI	$ 2,566,309	$ 2,605,574	$ 2,666,805	$ 2,741,000	$ 3,217,680	$ 3,306,809	$ 3,399,400	$ 20,503,576	$ 12,664,889				
6	GSHUT-C004	C4 - Controls related to External Events	3	AX	$ 317,746	$ 322,607	$ 330,188	$ 376,100	$ 411,272	$ 422,664	$ 434,499	$ 2,615,076	$ 1,644,535				N/A
7	GSHUT-C004	C4 - Controls related to External Events	3	IG	$ 2,534,513	$ 1,565,001	$ 2,124,000	$ 3,000,000	$ 2,602,911	$ 2,675,011	$ 2,749,912	$ 17,251,348	$ 11,027,834				
8	GSHUT-C004	C4 - Controls related to External Events	3	KG	$ 380,598	$ 400,000	$ 410,000	$ -	$ -	$ -	$ -	$ 1,190,598	$ -				
9	GSHUT-C005	C5 - Maintaining the Systems	3	AK	$ 383,703	$ 389,574	$ 398,729	$ 410,000	$ 507,465	$ 521,522	$ 536,124	$ 3,147,116	$ 1,975,111				N/A
10	GSHUT-C005	C5 - Maintaining the Systems	3	AX	$ 1,217,624	$ 1,236,254	$ 1,265,306	$ 1,301,000	$ 1,575,830	$ 1,619,481	$ 1,664,826	$ 9,880,320	$ 6,161,136				
11	GSHUT-C005	C5 - Maintaining the Systems	3	KH	$ 18,243,465	$ 18,306,344	$ 18,736,543	$ 26,999,000	$ 26,850,026	$ 27,593,772	$ 28,366,397	$ 165,095,546	$ 109,809,195				
12	GSHUT-C005	C5 - Maintaining the Systems	3	KI	$ 1,061,641	$ 1,077,888	$ 1,103,219	$ 1,134,000	$ 1,251,295	$ 1,285,956	$ 1,321,963	$ 8,235,962	$ 4,993,214				
13	GSHUT-C005	C5 - Maintaining the Systems	4	KL	$ 14,392,966	$ 14,540,791	$ 14,808,342	$ 15,147,000	$ 15,070,551	$ 15,438,272	$ 15,822,685	$ 105,220,607	$ 61,478,508				
14	GSHUT-C005	C5 - Maintaining the Systems	4	KM	$ 2,905,035	$ 2,934,376	$ 2,988,369	$ 3,057,000	$ 3,956,435	$ 4,052,973	$ 4,153,892	$ 24,048,080	$ 15,220,299				
15	GSHUT-C005	C5 - Maintaining the Systems	4	KR	$ 5,219,618	$ 5,272,336	$ 5,369,347	$ 5,492,000	$ 5,467,253	$ 5,600,654	$ 5,740,110	$ 38,161,317	$ 22,300,016				
16	GSHUT-C005	C5 - Maintaining the Systems	4	KS	$ 37,032	$ 37,406	$ 38,094	$ 39,000	$ 86,207	$ 88,310	$ 90,509	$ 416,559	$ 304,026				
17	GSHUT-C006	C6 - Operating the Facility Within Requirements	3	AB	$ 242,237	$ 65,000	$ -	$ -	$ -	$ -	$ -	$ 307,237	$ -				N/A
18	GSHUT-C006	C6 - Operating the Facility Within Requirements	3	AK	$ 561,275	$ 569,862	$ 583,254	$ 599,000	$ 790,191	$ 812,080	$ 834,818	$ 4,750,480	$ 3,036,089				
19	GSHUT-C006	C6 - Operating the Facility Within Requirements	4	AK	$ 1,758,864	$ 1,776,629	$ 1,809,319	$ 1,851,000	$ 3,140,520	$ 3,217,149	$ 3,297,256	$ 16,850,736	$ 11,505,924				
20	GSHUT-C006	C6 - Operating the Facility Within Requirements	3	KG	$ 4,502,596	$ 4,621,061	$ 4,729,655	$ 6,524,000	$ 10,548,709	$ 10,840,908	$ 11,144,453	$ 52,911,382	$ 39,058,070				
21	GSHUT-C006	C6 - Operating the Facility Within Requirements	4	KQ	$ 2,166,691	$ 879,559	$ 900,225	$ 916,252	$ 937,784	$ 960,666	$ 984,586	$ 7,745,762	$ 3,799,287				
22		**Total**			**$ 62,827,072**	**$ 60,228,349**	**$ 61,974,742**	**$ 73,677,926**	**$ 80,108,958**	**$ 82,233,402**	**$ 84,444,927**	**$ 505,495,375**	**$ 320,465,213**				
23		Total Chapter 3			$ 35,785,591	$ 34,217,389	$ 35,477,792	$ 46,576,674	$ 50,660,017	$ 52,063,300	$ 53,521,072	$ 308,301,835	$ 202,821,063				
		Total Chapter 4			$ 27,041,481	$ 26,010,960	$ 26,496,950	$ 27,101,252	$ 29,448,940	$ 30,170,102	$ 30,923,855	$ 197,193,540	$ 117,644,150				
24		**Total**			**$ 62,827,072**	**$ 60,228,349**	**$ 61,974,742**	**$ 73,677,926**	**$ 80,108,958**	**$ 82,233,402**	**$ 84,444,927**	**$ 505,495,375**	**$ 320,465,213**				

25 Notes:
26 (1) NPV uses a base year of 2024.
27 (2) CBR calculations include allocated Foundational Activity program costs.
28 (3) CBRs for mitigation or controls associated with more than one major work category (MWC) or maintenance activity type (MAT) are listed only once, the first time they appear on this schedule.
29 (4) **Step 3 Exempt** indicates this program is exempt from Step 3 Supplemental Analysis in the GRC and does not require a CBR to be calculated. For additional information on Step 3 Supplemental Analysis, See D.22-12-027, Appendix A, p. A-17, No. 28.

Workpaper Table 2-7
Pacific Gas and Electric Company
2027 General Rate Case
Exhibit (PG&E-5), Chapter 2, Energy Supply Risk Management
Extended Unplanned Shutdown of a Critical Power Generation Asset - Recorded and Forecast Mitigation Costs - Capital

					NOMINAL DOLLARS								MILLIONS OF DOLLARS (NPV) [1]			
Line No.	Risk Program ID	Risk Program Name	Chapter	MWC	2024	2025	2026	2027	2028	2029	2030	Total (2024-2030)	Total (2027-2030)	Program Cost (2027-2030) [A]	Foundational Activity Cost [B]	Risk Reduction [C]	CBR [2], [3], [4] [C]/([A]+[B])
1	GSHUT-M001	M1 - Component Replacement or Repair Civil	3	2L	$ 10,458,628	$ 9,216,281	$ -	$ -	$ 1,484,476	$ 3,120,574	$ 262,404	$ 24,542,363	$ 4,867,454				N/A
2	GSHUT-M001	M1 - Component Replacement or Repair Civil	3	2M	$ 750,370	$ 2,030,750	$ 7,776,541	$ 14,580,644	$ 14,623,126	$ 8,797,600	$ 24,828,086	$ 73,387,117	$ 62,829,456				
3	GSHUT-M001	M1 - Component Replacement or Repair Civil	3	2N	$ 9,596,573	$ 5,861,294	$ 2,093,779	$ 4,249,905	$ 1,537,936	$ 3,736,367	$ 2,788,980	$ 29,864,835	$ 12,313,189				
4	GSHUT-M001	M1 - Component Replacement or Repair Civil	3	2P	$ 7,659,269	$ 4,960,555	$ 9,845,918	$ 9,938,203	$ 3,377,831	$ 6,218,955	$ 2,575,146	$ 44,575,876	$ 22,110,135				
5	GSHUT-M002	M2 - Component Replacement or Repair Electrical	3	2L	$ 1,131,494	$ 232,195	$ 4,102,168	$ 4,379,786	$ 1,508,891	$ 1,367,851	$ 502,316	$ 13,224,702	$ 7,758,845				N/A
6	GSHUT-M002	M2 - Component Replacement or Repair Electrical	3	2M	$ 47,943,674	$ 47,395,900	$ 49,718,371	$ 83,204,942	$ 51,517,160	$ 69,130,525	$ 112,024,874	$ 460,935,445	$ 315,877,500				
7	GSHUT-M002	M2 - Component Replacement or Repair Electrical	3	2N	$ 2,445,322	$ 197,149	$ 426,995	$ 841,915	$ 688,107	$ 26,005	$ -	$ 4,625,494	$ 1,556,027				
8	GSHUT-M002	M2 - Component Replacement or Repair Electrical	3	2P	$ 2,791,278	$ 5,469,929	$ 6,930,421	$ 11,918,763	$ 11,347,684	$ 3,278,107	$ 1,499,452	$ 43,235,636	$ 28,044,007				
9	GSHUT-M002	M2 - Component Replacement or Repair Electrical	4	2S	$ 1,060,718	$ 6,100,779	$ 1,451,784	$ 1,783,538	$ 1,100,971	$ -	$ -	$ 11,497,790	$ 2,884,509				
10	GSHUT-M002	M2 - Component Replacement or Repair Electrical	4	2T	$ 246,392	$ 153,000	$ 121,111	$ 152,211	$ 149,549	$ 174,752	$ 163,065	$ 1,160,080	$ 639,577				
11	GSHUT-M002	M2 - Component Replacement or Repair Electrical	3	3H	$ 3,317,107	$ 6,057,807	$ 7,270,452	$ 14,713,311	$ 17,628,894	$ 7,264,028	$ 8,722,637	$ 64,974,237	$ 48,328,870				
12	GSHUT-M003	M3 - Component Replacement or Repair Mechanical	3	05	$ 1,581,555	$ 950,000	$ 768,592	$ 1,035,983	$ 1,099,045	$ 1,370,650	$ 1,358,371	$ 8,164,195	$ 4,864,049				N/A
13	GSHUT-M003	M3 - Component Replacement or Repair Mechanical	4	05	$ 489,393	$ 404,846	$ 320,905	$ 401,482	$ 395,332	$ 462,775	$ 430,487	$ 2,905,219	$ 1,690,076				
14	GSHUT-M003	M3 - Component Replacement or Repair Mechanical	3	2L	$ 4,229,073	$ 3,103,486	$ 1,061,569	$ 6,710,837	$ 2,362,285	$ 10,695,645	$ 1,376,730	$ 29,539,626	$ 21,145,498				
15	GSHUT-M003	M3 - Component Replacement or Repair Mechanical	3	2M	$ 56,947,559	$ 64,899,102	$ 47,034,578	$ 78,678,749	$ 87,727,318	$ 57,324,533	$ 69,128,122	$ 461,739,962	$ 292,858,723				
16	GSHUT-M003	M3 - Component Replacement or Repair Mechanical	3	2N	$ 201,206	$ -	$ 138,919	$ 1,774,959	$ 469,348	$ 676,124	$ 562,294	$ 3,822,851	$ 3,482,726				
17	GSHUT-M003	M3 - Component Replacement or Repair Mechanical	3	2P	$ 254,065	$ 1,386,823	$ 374,685	$ 1,132,720	$ 321,117	$ 520,096	$ 562,294	$ 4,551,800	$ 2,536,227				
18	GSHUT-M003	M3 - Component Replacement or Repair Mechanical	4	2S	$ 7,636,061	$ 11,710,454	$ 13,080,859	$ 18,089,692	$ 16,814,260	$ 22,098,022	$ 22,023,047	$ 111,452,393	$ 79,025,020				
19	GSHUT-M004	M4 - External Event Mitigation	3	2L	$ 193,648	$ -	$ 390,935	$ 199,040	$ 3,285,654	$ 3,557,552	$ 3,106,885	$ 10,733,715	$ 10,149,132				N/A
20	GSHUT-M004	M4 - External Event Mitigation	3	2M	$ 1,614,431	$ 382,858	$ 421,206	$ -	$ -	$ -	$ -	$ 2,418,494	$ -				
21		**Total**			**$ 160,547,818**	**$ 170,513,207**	**$ 153,329,787**	**$ 253,786,681**	**$ 217,438,983**	**$ 199,820,162**	**$ 251,915,192**	**$ 1,407,351,830**	**$ 922,961,018**				
22		Total Chapter 3			$ 151,115,254	$ 152,144,128	$ 138,355,129	$ 233,359,759	$ 198,978,872	$ 177,084,613	$ 229,298,593	$ 1,280,336,348	$ 838,721,837				
23		Total Chapter 4			$ 9,432,564	$ 18,369,079	$ 14,974,658	$ 20,426,922	$ 18,460,111	$ 22,735,549	$ 22,616,599	$ 127,015,482	$ 84,239,181				
24		**Total**			**$ 160,547,818**	**$ 170,513,207**	**$ 153,329,787**	**$ 253,786,681**	**$ 217,438,983**	**$ 199,820,162**	**$ 251,915,192**	**$ 1,407,351,830**	**$ 922,961,018**				

25 Notes:
26 (1) NPV uses a base year of 2024.
27 (2) CBR calculations include allocated Foundational Activity program costs.
28 (3) CBRs for mitigation or controls associated with more than one major work category (MWC) or maintenance activity type (MAT) are listed only once, the first time they appear on this schedule.
29 (4) **Step 3 Exempt** indicates this program is exempt from Step 3 Supplemental Analysis in the GRC and does not require a CBR to be calculated. For additional information on Step 3 Supplemental Analysis, See D.22-12-027, Appendix A, p. A-17, No. 28.

Workpaper Table 2-8
Pacific Gas and Electric Company
2027 General Rate Case
Exhibit (PG&E-5), Chapter 2, Energy Supply Risk Management
Extended Unplanned Shutdown of a Critical Power Generation Asset - Recorded and Forecast Mitigation Costs - Expense

Line No.	Risk Program ID	Risk Program Name	Chapter	MAT	NOMINAL DOLLARS 2024	2025	2026	2027	2028	2029	2030	Total (2024-2030)	Total (2027-2030)	MILLIONS OF DOLLARS (NPV) [1] Program Cost (2027-2030) [A]	Foundational Activity Cost [B]	Risk Reduction [C]	CBR [2], [3], [4] [C]/([A]+[B])
1	GSHUT-M001	M1 - Component Replacement or Repair Civil	3	AX	$ 78,995	$ -	$ -	$ -	$ 250,000	$ -	$ -	$ 328,995	$ 250,000				N/A
2	GSHUT-M001	M1 - Component Replacement or Repair Civil	3	KI	$ -	$ -	$ -	$ 100,000	$ -	$ -	$ -	$ 100,000	$ 100,000				
3	GSHUT-M002	M2 - Component Replacement or Repair Electrical	3	IG	$ 108,148	$ 1,700,000	$ 550,000	$ -	$ -	$ -	$ -	$ 2,358,148	$ -				N/A
4	GSHUT-M003	M3 - Component Replacement or Repair Mechanical	3	AX	$ 189,917	$ -	$ -	$ -	$ 800,000	$ -	$ -	$ 989,917	$ 800,000				N/A
5	GSHUT-M003	M3 - Component Replacement or Repair Mechanical	3	KH	$ -	$ 800,000	$ -	$ 2,600,000	$ 1,541,400	$ 2,459,097	$ 1,628,451	$ 9,028,948	$ 8,228,948				
6	GSHUT-M003	M3 - Component Replacement or Repair Mechanical	3	KI	$ 5,279	$ -	$ -	$ -	$ 250,000	$ -	$ -	$ 255,279	$ 250,000				
7	GSHUT-M003	M3 - Component Replacement or Repair Mechanical	4	KL	$ 7,879,060	$ 10,275,000	$ 10,517,226	$ 11,470,129	$ 11,739,677	$ 12,026,125	$ 12,325,576	$ 76,232,793	$ 47,561,507				
8	GSHUT-M004	M4 - External Event Mitigation	3	AX	$ -	$ 1,000,000	$ 1,000,000	$ 3,000,000	$ 1,893,475	$ 1,945,735	$ 1,999,632	$ 10,838,842	$ 8,838,842				N/A
9		**Total**			**$ 8,261,399**	**$ 13,775,000**	**$ 12,067,226**	**$ 17,170,129**	**$ 16,474,552**	**$ 16,430,957**	**$ 15,953,659**	**$ 100,132,922**	**$ 66,029,297**				
10																	
11		Total Chapter 3			$ 382,339	$ 3,500,000	$ 1,550,000	$ 5,700,000	$ 4,734,875	$ 4,404,832	$ 3,628,083	$ 23,900,129	$ 18,467,790				
12		Total Chapter 4			$ 7,879,060	$ 10,275,000	$ 10,517,226	$ 11,470,129	$ 11,739,677	$ 12,026,125	$ 12,325,576	$ 76,232,793	$ 47,561,507				
13		**Total**			**$ 8,261,399**	**$ 13,775,000**	**$ 12,067,226**	**$ 17,170,129**	**$ 16,474,552**	**$ 16,430,957**	**$ 15,953,659**	**$ 100,132,922**	**$ 66,029,297**				

14 Notes:
15 (1) NPV uses a base year of 2024.
16 (2) CBR calculations include allocated Foundational Activity program costs.
17 (3) CBRs for mitigation or controls associated with more than one major work category (MWC) or maintenance activity type (MAT) are listed only once, the first time they appear on this schedule.
18 (4) **Step 3 Exempt** indicates this program is exempt from Step 3 Supplemental Analysis in the GRC and does not require a CBR to be calculated. For additional information on Step 3 Supplemental Analysis, See D.22-12-027, Appendix A, p. A-17, No. 28.

Workpaper Table 2-9
Pacific Gas and Electric Company
2027 General Rate Case
Exhibit (PG&E-5), Chapter 2, Energy Supply Risk Management
Estimated Costs from PG&E's 2024 RAMP Report Compared to 2027 GRC Forecast Costs - Large Uncontrolled Water Release

	2024 RAMP				2027 GRC				
Line No.	Program ID	Program Name	Exh. 5, Chapter	MWC	Program ID	Program Name	Exh. 5, Chapter	MWC	Cost Type
1					LGUWR-C001	C1 - Maintenance	3	2N	Capital
2	LGUWR-C001	Maintenance	1	AX	LGUWR-C001	C1 - Maintenance [5]	3	AX	Expense
3					LGUWR-C001	C1 - Maintenance	3	IG	Expense
4						**Subtotal: C1 - Maintenance**			
5							**TOTAL CONTROLS - Capital**		
6							**TOTAL CONTROLS - Expense**		

As Presented in 2024 RAMP

	THOUSANDS OF NOMINAL DOLLARS								MILLIONS OF DOLLARS (NPV)[1]			
Line No.	2024	2025	2026	2027	2028	2029	2030	Total (2024-2030)	Program Cost (2027-2030) [A]	Foundational Activity Cost [B]	Risk Reduction [C]	CBR [2,3] [C]/([A]+[B])
1									$ 18.8	$ 2.1	$ 26.2	1.4
2	$ 3,959	$ 4,045	$ 4,398	$ 6,440	$ 6,781	$ 6,927	$ 7,078	$ 39,628				
3												
4	**$ 3,959**	**$ 4,045**	**$ 4,398**	**$ 6,440**	**$ 6,781**	**$ 6,927**	**$ 7,078**	**$ 39,628**				
5	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**				
6	**$ 3,959**	**$ 4,045**	**$ 4,398**	**$ 6,440**	**$ 6,781**	**$ 6,927**	**$ 7,078**	**$ 39,628**				

As Presented in 2027 GRC

	THOUSANDS OF NOMINAL DOLLARS								MILLIONS OF DOLLARS (NPV)[1]				THOUSANDS OF NOMINAL DOLLARS		
Line No.	2024	2025	2026	2027	2028	2029	2030	Total (2024-2030)	Program Cost (2027-2030) [A]	Foundational Activity Cost [B]	Risk Reduction [C]	CBR [2,3,4] [C]/([A]+[B])	RAMP 2024-2030	GRC 2024-2030	Difference (GRC - RAMP)
1	$ 212	$ 300	$ 342	$ 460	$ 488	$ 609	$ 604	$ 3,016	$ 76.6	$ 19.9	$ 34.7	0.4			
2	$ 15,675	$ 13,782	$ 14,106	$ 25,966	$ 28,429	$ 29,217	$ 30,288	$ 157,464							
3	$ 1,773	$ 2,872	$ 1,350	$ 272	$ 15	$ -	$ -	$ 6,282							
4	**$ 17,660**	**$ 16,954**	**$ 15,798**	**$ 26,699**	**$ 28,933**	**$ 29,826**	**$ 30,892**	**$ 166,762**					**$ 39,628**	**$ 166,762**	**$ 127,134**
5	**$ 212**	**$ 300**	**$ 342**	**$ 460**	**$ 488**	**$ 609**	**$ 604**	**$ 3,016**					**$ -**	**$ 3.016**	**$ 3.016**
6	**$ 17,448**	**$ 16,654**	**$ 15,456**	**$ 26,239**	**$ 28,444**	**$ 29,217**	**$ 30,288**	**$ 163,746**					**$ 39.628**	**$ 163.746**	**$ 124.118**

7

8 Notes:
9 (1) NPV uses a base year of 2024.
10 (2) CBR calculations include allocated Foundational Activity program costs.
11 (3) CBRs for mitigation or controls associated with more than one major work category (MWC) or maintenance activity type (MAT) are listed only once, the first time they appear on this schedule.
12 (4) **Step 3 Exempt** indicates this program is exempt from Step 3 Supplemental Analysis in the GRC and does not require a CBR to be calculated. For additional information on Step 3 Supplemental Analysis. See D.22-12-027, Appendix A, p. A-17, No. 28.
13 (5) There are minor inconsistencies between the cost forecast shown here and the cost forecast used to compute the Cost-Benefit Ratio (CBR). These inconsistencies will be corrected in an errata filing.

Internal

Workpaper Table 2-10
Pacific Gas and Electric Company
2027 General Rate Case
Exhibit (PG&E-5), Chapter 2, Energy Supply Risk Management
Estimated Costs from PG&E's 2024 RAMP Report Compared to 2027 GRC Forecast Costs - Large Uncontrolled Water Release

Line No.	2024 RAMP Program ID	2024 RAMP Program Name	2024 RAMP Exh. 5, Chapter	2024 RAMP MWC	2027 GRC Program ID	2027 GRC Program Name	2027 GRC Exh. 5, Chapter	2027 GRC MWC	Cost Type
1	LGUWR-M001	Internal Erosion	1	AX	LGUWR-M001	M1 - Internal Erosion Mitigation		AX	Expense
2	LGUWR-M001	Internal Erosion	1	2L, 2N	LGUWR-M001	M1 - Internal Erosion Mitigation	3	2L	Capital
3					LGUWR-M001	M1 - Internal Erosion Mitigation	3	2N	Capital
4						**Subtotal: M1 - Internal Erosion Mitigation**			
5	LGUWR-M002	Spillway	1	2L, 2M, 2N, 3H	LGUWR-M002	M2 - Spillway Remediation	3	2L	Capital
6					LGUWR-M002	M2 - Spillway Remediation	3	2M	Capital
7					LGUWR-M002	M2 - Spillway Remediation	3	2N	Capital
8					LGUWR-M002	M2 - Spillway Remediation	3	3H	Capital
9	LGUWR-M002	Spillway	1	AX, KJ, NA	LGUWR-M002	M2 - Spillway Remediation (5)	3	AX	Expense
10						**Subtotal: M2 - Spillway Remediation**			
11	LGUWR-M003	Seismic retrofit	1	2L, 2N	LGUWR-M003	M3 - Seismic Retrofit	3	2L	Capital
12					LGUWR-M003	M3 - Seismic Retrofit	3	2M	Capital
13					LGUWR-M003	M3 - Seismic Retrofit	3	2N	Capital
14					LGUWR-M003	M3 - Seismic Retrofit	3	2P	Capital
15						**Subtotal: M3 - Seismic Retrofit**			
16	LGUWR-M004	LLO	1	2L, 2M, 2N	LGUWR-M004	M4 - LLO Refurbishment	3	2L	Capital
17					LGUWR-M004	M4 - LLO Refurbishment	3	2M	Capital
18					LGUWR-M004	M4 - LLO Refurbishment	3	2N	Capital
19	LGUWR-M004	LLO	1	AX	LGUWR-M004	M4 - LLO Refurbishment	3	AX	Expense
20						**Subtotal: M4 - LLO Refurbishment**			
21	LGUWR-M005	Physical Security	1	2L, 2P, 3H	LGUWR-M005	M5 - Physical Security	3	2L	Capital
22					LGUWR-M005	M5 - Physical Security (6)	3	2P	Capital
23					LGUWR-M005	M5 - Physical Security	3	3H	Capital
24	LGUWR-M005	Physical Security	1	AX	LGUWR-M005	M5 - Physical Security	3	AX	Expense
25						**Subtotal: M5 - Physical Security (6)**			
26									**TOTAL MITIGATIONS - Capital**
27									**TOTAL MITIGATIONS - Expense**

As Presented in 2024 RAMP

Line No.	THOUSANDS OF NOMINAL DOLLARS 2024	2025	2026	2027	2028	2029	2030	Total (2024-2030)	MILLIONS OF DOLLARS (NPV) [1] Program Cost (2027-2030) [A]	Foundational Activity Cost [B]	Risk Reduction [C]	CBR [2,3] [C]/([A]+[B])
1	$ 530	$ 467	$ 100	$ -	$ -	$ -	$ -	$ 1,096	$ 136.7	$ 11.0	$ 58.3	0.4
2	$ 54,441	$ 74,386	$ 91,599	$ 24,748	$ 24,838	$ 50,874	$ 50,443	$ 371,328				
3												
4	**$ 54,971**	**$ 74,852**	**$ 91,699**	**$ 24,748**	**$ 24,838**	**$ 50,874**	**$ 50,443**	**$ 372,425**				
5	$ 57,706	$ 89,945	$ 57,494	$ 175,071	$ 169,572	$ 180,083	$ 208,314	$ 938,184	$ 694.4	$ 20.5	$ 650.6	0.5
6												
7												
8												
9	$ 4,003	$ 1,728	$ 3,100	$ 7,050	$ 6,300	$ 6,300	$ 6,300	$ 34,781				
10	**$ 61,709**	**$ 91,672**	**$ 60,594**	**$ 182,121**	**$ 175,872**	**$ 186,383**	**$ 214,614**	**$ 972,964**				
11	$ 990	$ 1,985	$ 5,186	$ 12,160	$ 12,190	$ 30,000	$ 30,000	$ 92,511	$ 76.0	$ 7.1	$ 37.7	0.5
12												
13												
14												
15	**$ 990**	**$ 1,985**	**$ 5,186**	**$ 12,160**	**$ 12,190**	**$ 30,000**	**$ 30,000**	**$ 92,511**				
16	$ 18,274	$ 31,393	$ 24,790	$ 23,647	$ 22,801	$ 25,997	$ 30,000	$ 176,902	$ 94.3	$ 7.9	$ 123.1	1.3
17												
18												
19	$ 500	$ 1,000	$ 3,000	$ -	$ -	$ -	$ -					
20	**$ 18,774**	**$ 32,393**	**$ 27,790**	**$ 23,647**	**$ 22,801**	**$ 25,997**	**$ 30,000**	**$ 181,402**				
21	$ 10,373	$ 14,382	$ 15,201	$ 14,661	$ 10,680	$ 14,321	$ 8,080	$ 87,698	$ 44.8	$ 5.4	$ 0.2	0.003
22												
23												
24	$ 822	$ 405	$ -	$ -	$ -	$ -	$ -					
25	**$ 11,195**	**$ 14,787**	**$ 15,201**	**$ 14,661**	**$ 10,680**	**$ 14,321**	**$ 8,080**	**$ 88,925**				
26	**$ 141,784**	**$ 212,090**	**$ 194,270**	**$ 250,286**	**$ 240,081**	**$ 301,275**	**$ 326,837**	**$ 1,666,623**				
27	**$ 5,855**	**$ 3,599**	**$ 6,200**	**$ 7,050**	**$ 6,300**	**$ 6,300**	**$ 6,300**	**$ 41,604**				

As Presented in 2027 GRC

Line No.	THOUSANDS OF NOMINAL DOLLARS 2024	2025	2026	2027	2028	2029	2030	Total (2024-2030)	MILLIONS OF DOLLARS (NPV) [1] Program Cost (2027-2030) [A]	Foundational Activity Cost [B]	Risk Reduction [C]	CBR [2,3,4] [C]/([A]+[B])
1	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 109.9	$ 24.6	$ 41.1	0.3
2	$ 41,176	$ 49,135	$ 32,342	$ 23,140	$ 26,152	$ 11,110	$ -	$ 183,056				
3	$ 8,904	$ 3,432	$ 3,701	$ 4,684	$ 18,438	$ 20,340	$ 19,370	$ 78,870				
4	**$ 50,080**	**$ 52,567**	**$ 36,043**	**$ 27,825**	**$ 44,591**	**$ 31,450**	**$ 19,370**	**$ 261,926**				
5	$ 44	$ 321	$ 1,880	$ 4,441	$ 16,536	$ 20,653	$ 17,038	$ 60,913	$ 702.5	$ 119.8	$ 890.4	1.1
6	$ 21	$ -	$ 874	$ 1,812	$ 2,752	$ 4,681	$ -	$ 10,141				
7	$ 13,752	$ 29,017	$ 23,280	$ 7,515	$ 10,777	$ 7,552	$ 6,691	$ 98,585				
8	$ 21,495	$ 28,639	$ 37,667	$ 64,836	$ 151,564	$ 146,686	$ 136,720	$ 587,607				
9	$ -	$ -	$ -	$ 156	$ 415	$ -	$ -	$ 571				
10	**$ 35,311**	**$ 57,978**	**$ 63,701**	**$ 78,760**	**$ 182,045**	**$ 179,572**	**$ 160,450**	**$ 757,817**				
11	$ 432	$ 364	$ 1,249	$ 5,550	$ 15	$ -	$ -	$ 7,609	$ 30.2	$ 4.9	$ 14.7	0.4
12	$ -	$ -	$ -	$ -	$ 459	$ 780	$ 1,406	$ 2,645				
13	$ 356	$ -	$ 184	$ 4,225	$ 606	$ 1,872	$ 9,372	$ 16,615				
14	$ -	$ -	$ -	$ -	$ -	$ 104	$ 234	$ 338				
15	**$ 788**	**$ 364**	**$ 1,433**	**$ 9,774**	**$ 1,079**	**$ 2,757**	**$ 11,012**	**$ 27,207**				
16	$ 230	$ 560	$ 1,686	$ 5,651	$ -	$ -	$ -	$ 8,128	$ 78.5	$ 14.9	$ 311.9	3.3
17	$ 35	$ -	$ 689	$ 70	$ -	$ -	$ -	$ 795				
18	$ 24,710	$ 23,002	$ 16,913	$ 21,728	$ 24,776	$ 18,790	$ 3,557	$ 133,475				
19	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -				
20	**$ 24,975**	**$ 23,562**	**$ 19,289**	**$ 27,449**	**$ 24,776**	**$ 18,790**	**$ 3,557**	**$ 142,398**				
21	$ 14	$ -	$ 543	$ -	$ -	$ -	$ -	$ 557	$ 56.6	$ 5.4	$ 0.1	0.002
22	$ -	$ -	$ -	$ -	$ -	$ 1,560	$ 1,406	$ 2,966				
23	$ 4,565	$ 4,907	$ 6,944	$ 15,728	$ 18,723	$ 15,533	$ 9,685	$ 76,085				
24	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -				
25	**$ 4,578**	**$ 4,907**	**$ 7,488**	**$ 15,728**	**$ 18,723**	**$ 17,093**	**$ 11,091**	**$ 79,608**				
26	**$ 115,733**	**$ 139,377**	**$ 127,953**	**$ 159,380**	**$ 270,800**	**$ 249,661**	**$ 205,479**	**$ 1,268,384**				
27	**$ -**	**$ -**	**$ -**	**$ 156**	**$ 415**	**$ -**	**$ -**	**$ 571**				

Line No.	THOUSANDS OF NOMINAL DOLLARS RAMP 2024-2030	GRC 2024-2030	Difference (GRC - RAMP)
4	**$ 372,425**	**$ 261,926**	**$ (110,499)**
10	**$ 972,964**	**$ 757,817**	**$ (215,148)**
15	**$ 92,511**	**$ 27,207**	**$ (65,304)**
20	**$ 181,402**	**$ 142,398**	**$ (39,004)**
25	**$ 88,925**	**$ 79,608**	**$ (9,317)**
26	**$ 1,666,623**	**$ 1,268,384**	**$ (398,239)**
27	**$ 41,604**	**$ 571**	**$ (41,033)**

28
29 Notes:
30 (1) NPV uses a base year of 2024.
31 (2) CBR calculations include allocated Foundational Activity program costs.
32 (3) CBRs for mitigation or controls associated with more than one major work category (MWC) or maintenance activity type (MAT) are listed only once, the first time they appear on this schedule.
33 (4) **Step 3 Exempt** indicates this program is exempt from Step 3 Supplemental Analysis in the GRC and does not require a CBR to be calculated. For additional information on Step 3 Supplemental Analysis, See D.22-12-027, Appendix A, p. A-17, No. 28
34 (5), (6) There are minor inconsistencies between the cost forecast shown here and the cost forecast used to compute the Cost-Benefit Ratio (CBR). These inconsistencies will be corrected in an errata filing.

Workpaper Table 2-11
Pacific Gas and Electric Company
2027 General Rate Case
Exhibit (PG&E-5), Chapter 2, Energy Supply Risk Management
Foundational Activities - Recorded and Forecast Costs - Capital and Expense

NOMINAL DOLLARS

Line No.	Risk Program ID	Risk Program Name	Chapter	MWC	2024	2025	2026	2027	2028	2029	2030	Total (2024-2030)	Total (2027-2030)
1	LGUWR-F001	F1 - Dam Safety Program	3	2L	$ 105,352	$ -	$ 645,498	$ 140,055	$ -	$ -	$ -	$ 890,904	$ 140,055
2	LGUWR-F001	F1 - Dam Safety Program	3	2N	$ 941,554	$ 1,656,901	$ 936,979	$ 3,304,621	$ 27,740	$ -	$ 1,640,026	$ 8,507,821	$ 4,972,387
3	LGUWR-F001	F1 - Dam Safety Program	3	AX	$ 994,016	$ 966,359	$ 879,669	$ 2,841,000	$ 3,558,951	$ 3,554,764	$ 3,654,298	$ 16,449,058	$ 13,609,014
4	LGUWR-F001	F1 - Dam Safety Program	3	IG	$ 4,289,426	$ 1,700,000	$ 2,671,150	$ 3,000,000	$ 3,773,853	$ 3,860,383	$ 3,953,949	$ 23,248,761	$ 14,588,185
5	LGUWR-F001	F1 - Dam Safety Program	3	KJ	$ 10,544,769	$ 13,725,285	$ 13,546,118	$ 23,142,000	$ 21,006,800	$ 21,729,201	$ 26,047,286	$ 129,741,460	$ 91,925,287
6	LGUWR-F002	F2 - FERC Security Plan [LGUWR]	3	KG	$ 20,021	$ 337,500	$ 345,431	$ 1,620,000	$ 1,611,841	$ 1,656,489	$ 1,702,871	$ 7,294,153	$ 6,591,200
7	GSHUT-F001	AM Inspection Programs	3	AX	$ 9,956,430	$ 9,259,079	$ 3,642,717	$ 8,181,000	$ 6,842,606	$ 7,032,063	$ 7,228,705	$ 52,142,599	$ 29,284,373
8	GSHUT-F001	AM Inspection Programs	3	IG	$ 2,246,689	$ 2,100,000	$ 1,651,000	$ -	$ -	$ -	$ -	$ 5,997,689	$ -
9	GSHUT-F001	AM Inspection Programs	3	KG	$ 270,627	$ 274,768	$ 281,225	$ 415,857	$ 248,658	$ 255,546	$ 262,701	$ 2,009,382	$ 1,182,763
10	GSHUT-F001	AM Inspection Programs	3	KH	$ 802,326	$ 814,602	$ 833,745	$ 1,038,685	$ 1,422,611	$ 1,461,985	$ 1,502,821	$ 7,876,776	$ 5,426,103
11	GSHUT-F001	AM Inspection Programs	3	KI	$ 511,150	$ 818,971	$ 531,167	$ 2,046,000	$ 2,121,643	$ 2,180,413	$ 2,241,464	$ 10,450,808	$ 8,589,520
12	GSHUT-F002	Plant Specific Equipment Monitoring/Inpsection	3	2M	$ 9,363	$ -	$ 306,272	$ 552,934	$ 1,756,636	$ 498,023	$ 468,579	$ 3,591,807	$ 3,276,171
13	GSHUT-F002	Plant Specific Equipment Monitoring/Inpsection	3	KH	$ -	$ 150,000	$ 200,000	$ 200,000	$ 75,000	$ -	$ -	$ 625,000	$ 275,000
14	GSHUT-F003	FERC Security Plan [GSHUT]	3	KG	$ 2,225	$ 37,500	$ 38,381	$ 180,000	$ 179,093	$ 184,054	$ 189,208	$ 810,461	$ 732,356
15	GSHUT-F004	AM Buildout and Framework	3	AX	$ 427,468	$ -	$ -	$ 1,200,000	$ 1,003,096	$ 1,030,881	$ 1,059,746	$ 4,721,190	$ 4,293,723
16		**Total**			**$ 31,121,417**	**$ 31,840,965**	**$ 26,509,352**	**$ 47,862,152**	**$ 43,628,529**	**$ 43,443,803**	**$ 49,951,653**	**$ 274,357,872**	**$ 184,886,137**

PACIFIC GAS AND ELECTRIC COMPANY
2027 GENERAL RATE CASE
EXHIBIT (PG&E-5) ENERGY SUPPLY

WORKPAPERS SUPPORTING
CHAPTER 3, HYDRO OPERATIONS COSTS

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PACIFIC GAS AND ELECTRIC COMPANY
2027 GENERAL RATE CASE
EXHIBIT (PG&E-5) ENERGY SUPPLY

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Table 3-1
Pacific Gas and Electric Company
2027 General Rate Case
Exhibit (PG&E-5), Chapter 3
Hydro Operations Costs
Expenses by Major Work Category
(Thousands of Nominal Dollars)

Line No.	MWC	Description	2020 Recorded Adjusted	2021 Recorded Adjusted	2022 Recorded Adjusted	2023 Recorded Adjusted	2024 Recorded Adjusted	2025 Forecast	2026 Forecast	2027 Forecast	Reference
1	AB	Misc Expense	7,212	7,105	5,754	4,909	5,080	2,926	2,588	4,354	WP 3-4, Line 39
2	AK	Manage Environmental Oper	1,046	963	966	839	981	994	1,017	1,045	WP 3-4, Line 50
3	AX	Maint Resv,Dams&Waterways	27,996	29,791	21,948	29,895	35,932	31,109	25,782	51,002	WP 3-10, Line 223
4	AY	Habitat and Species Protection	112	77	101	145	175	178	182	187	WP 3-10, Line 225
5	BC	Perf Reimburs Wk for Oth	(115)	(129)	(643)	353	(175)				WP 3-10, Line 235
6	EP	Manage Property & Bldgs	1,461	1,287	1,887	1,940	1,926	1,956	2,002	2,058	WP 3-10, Line 244
7	IG	Manage Var Bal Acct Processes	18,812	22,995	32,728	27,117	34,850	31,111	28,301	55,000	WP 3-15, Line 388
8	KG	Operate Hydro Generation	44,462	43,123	38,864	39,546	40,707	42,522	43,214	56,053	WP 3-19, Line 506
9	KH	Maint Hydro Generating Equip	23,094	20,781	21,408	24,439	24,427	25,019	24,835	42,136	WP 3-22, Line 619
10	KI	Maint Hydro Bldg,Grnd,Infrast	9,080	10,399	9,864	13,587	12,418	12,364	12,347	18,254	WP 3-25, Line 687
11	KJ	License Compliance Hydro Gen	22,115	23,006	22,229	24,420	26,110	29,003	28,919	40,613	WP 3-27, Line 761
12	OM	Operational Management	2,794	3,090	2,360	2,323	2,386	2,180	2,262	2,347	WP 3-28, Line 777
13	OS	Operational Support	2,836	1,675	8,030	10,318	14,241	10,861	11,268	11,690	WP 3-28, Line 787
14	**Total**		**160,906**	**164,163**	**165,497**	**179,830**	**199,057**	**190,223**	**182,717**	**284,740**	Sum Lines 1-13

Table 3-1
Pacific Gas and Electric Company
2027 General Rate Case
Exhibit (PG&E-5), Chapter 3
Hydro Operations Costs
Expenses by Major Work Category
(Thousands of Nominal Dollars)

Line No.	MWC	Description	2020 Recorded Adjusted	2021 Recorded Adjusted	2022 Recorded Adjusted	2023 Recorded Adjusted	2024 Recorded Adjusted	2025 Forecast	2026 Forecast	2027 Forecast
1	AB	Misc Expense	8,962	8,325	6,067	4,961	5,080	2,888	2,499	4,095
2	AK	Manage Environmental Oper	1,242	1,097	1,032	866	981	981	983	983
3	AX	Maint Resv,Dams&Waterways	34,663	34,461	23,300	30,447	35,932	30,705	24,897	47,967
4	AY	Habitat and Species Protection	133	87	107	148	175	176	176	176
5	BC	Perf Reimburs Wk for Oth	1,686	2	(588)	381	(175)			
6	EP	Manage Property & Bldgs	1,717	1,443	2,018	1,994	1,926	1,931	1,933	1,936
7	IG	Manage Var Bal Acct Processes	24,148	27,393	34,477	27,395	34,850	30,733	27,359	51,838
8	KG	Operate Hydro Generation	52,998	48,988	41,514	40,703	40,707	41,970	41,730	52,717
9	KH	Maint Hydro Generating Equip	27,694	23,822	22,814	25,096	24,427	24,694	23,982	39,628
10	KI	Maint Hydro Bldg,Grnd,Infrast	11,149	12,069	10,452	13,850	12,418	12,203	11,924	17,168
11	KJ	License Compliance Hydro Gen	27,478	26,836	23,486	24,767	26,110	28,626	27,930	38,203
12	OM	Operational Management	3,229	3,460	2,532	2,404	2,386	2,152	2,184	2,207
13	OS	Operational Support	3,329	1,918	8,607	10,678	14,241	10,719	10,881	10,995
14	**Total**		**198,428**	**189,900**	**175,818**	**183,689**	**199,057**	**187,777**	**176,478**	**267,912**

Pacific Gas and Electric Company
2027 General Rate Case
Exhibit (PG&E-5), Chapter 3
Hydro Generation Operations
Expenses by Planning Order
(Thousands of Nominal Dollars)

Line No.	MWC	Planning Order	Description	2020 Recorded Adjusted	2021 Recorded Adjusted	2022 Recorded Adjusted	2023 Recorded Adjusted	2024 Recorded Adjusted	2025 Forecast	2026 Forecast	2027 Forecast	WP Reference
1	AB	5031867	PCC-12679-Elec-PGEN-Hydro Balch Lodgi	33	147	39	83	56	-	-	-	
2	AB	5031868	PCC-13548-Elec - PGen-Hydro Helms	834	484	(12)	-	-	-	-	-	
3	AB	5034770	Asset Strategy Dir - Contract & Consult	10	-	-	-	-	-	-	-	
4	AB	5034771	Business Ops - Contract & Consulting	88	-	-	-	-	-	-	-	
5	AB	5034772	Engineering - Contract & Consulting	318	14	107	37	67	68	69	71	
6	AB	5034773	Project Execution - Contract & Consult	34	14	45	9	138	140	143	147	
7	AB	5034789	PG VP - Contract & Consult	207	10	92	82	66	-	-	78	
8	AB	5034909	PG Portion of Annual EEI Dues	107	113	105	118	116	118	120	124	
9	AB	5035350	Engineering & Projects - Facility Costs	128	228	203	238	211	215	220	226	
10	AB	5037623	Cost Model Adjustment-AB	-	-	-	-	1	-	-	-	
11	AB	5038369	PCC 15860 - Portfolio Strategy - Hydro	851	981	804	633	1	-	-	-	
12	AB	5051869	Indirect Labor OH Var - Power Gen	(0)	0	348	304	(0)	-	-	-	
13	AB	5059529	Outage & PrjMgt Dir -Contract&Consulting	-	49	-	18	14	15	15	15	
14	AB	5068000	PG VP - Fixed Wing Flight Services	-	-	-	-	2	2	2	2	
15	AB	5069992	Construction - Fleet Rentals	-	-	-	-	136	-	-	-	
16	AB	5069993	Outage/Project Mgmt - Fleet Rentals	-	-	-	-	13	-	-	-	
17	AB	5069994	Eng/Tech Services - Fleet Rentals	-	-	-	-	20	-	-	-	
18	AB	5069995	Hydro Water Mgmt - Fleet Rentals	-	-	-	-	20	-	-	-	
19	AB	5069996	Asset Mgmt/Maint Planning - Fleet Rental	-	-	-	-	9	-	-	-	
20	AB	5069997	O&M Support - Fleet Rentals	-	-	-	-	2	-	-	-	
21	AB	5251412	Hydro PH Disposition Support	527	736	854	(112)	50	250	256	263	
22	AB	5255065	Proj. Mgmt. - Systems / Tools	4	38	24	-	5	5	5	5	
23	AB	5261153	Decommissioning Study Program	174	48	19	-	1	50	51	53	
24	AB	5265077	FSP: Dam Safety 2.0 Implementation	904	141	-	-	-	-	-	-	
25	AB	5265792	AM: Applications and Tools	41	90	2	4	69	-	-	-	
26	AB	5268973	Spillway Contracts and Consulting SAIP	230	16	-	-	-	-	-	-	
27	AB	5269273	ISO 55000 Certification	360	1,513	844	584	271	160	164	168	
28	AB	5271874	New Gen Studies	5	1	96	230	178	-	-	-	
29	AB	5272412	AM: Data Governance	-	47	88	427	415	50	51	52	
30	AB	5276133	Atmospheric River 10/24/21 Hydr non-MEB	-	26	-	-	-	-	-	-	
31	AB	5279254	PowerApp Premium License	349	437	309	15	15	-	-	-	
32	AB	5281612	Crane Valley Cultural Resources	-	-	-	145	177	350	-	-	
33	AB	5285467	Team Building	-	-	-	-	1	-	-	-	

Pacific Gas and Electric Company
2027 General Rate Case
Exhibit (PG&E-5), Chapter 3
Hydro Generation Operations
Expenses by Planning Order
(Thousands of Nominal Dollars)

Line No.	MWC	Planning Order	Description	2020 Recorded Adjusted	2021 Recorded Adjusted	2022 Recorded Adjusted	2023 Recorded Adjusted	2024 Recorded Adjusted	2025 Forecast	2026 Forecast	2027 Forecast	WP Reference
34	AB	5285612	Lands Conservation Support	2,008	1,970	1,788	1,460	1,192	300	307	650	WP 3-309
35	AB	5280092	Power Generation Compliance Maturity	-	-	-	635	242	65	-	-	
36	AB	5280128	PGEN Training Crafting Proficiency	-	-	-	-	753	1,140	1,185	2,500	WP 3-515
37	AB	5282961	PG Planning & Budget Process/LTP Support	-	-	-	-	794	-	-	-	
38	AB	5285692	Upper Centerv Canal Water Del - SHF ATL	-	-	-	-	45	-	-	-	
39	**AB**	**AB Total**		**7,212**	**7,105**	**5,754**	**4,909**	**5,080**	**2,926**	**2,588**	**4,354**	Sum of Lines 1-38
40	**AB**											
41	AK	5000493	Shasta Manage Environmental Opns	258	183	189	169	163	166	170	174	
42	AK	5000494	DeSabla Manage Environmental Opns	249	157	219	245	278	282	289	297	
43	AK	5000495	Drum Manage Environmental Ops	115	127	132	76	106	107	110	113	
44	AK	5000496	ML Manage Environmental Ops	156	115	119	100	93	94	96	99	
45	AK	5000497	KCV Manage Environmental Opns	133	177	157	168	193	196	200	206	
46	AK	5000498	Helms Manage Environmental	51	42	72	45	113	114	117	120	
47	AK	5009059	Potter Valley Manage Environmental Op.	-	-	-	-	0	-	-	-	
48	AK	5011570	AM: Powerhouse SPCC Plan Program	85	118	84	38	34	35	35	36	
49	AK	5053409	Potter Valley Manage Enviro Projects	-	44	(6)	0	2	-	-	-	
50	**AK**	**AK Total**		**1,046**	**963**	**966**	**839**	**981**	**994**	**1,017**	**1,045**	Sum of Lines 41-49
51	**AK**											
52	AX	5280074	PG Spillway Vegetation Management	-	-	-	1,610	454	-	-	3,231	WP 3-515
53	AX	5247934	HC: Weather/Seismic/Wildfire Emergent W	-	-	-	-	-	1,000	1,000	3,000	WP 3-274
54	AX	5287183	Dredging Program (Maintenance)	-	-	-	-	-	-	-	1,800	WP 3-441
55	AX	5284352	PG Dam Rodent Abatement	-	-	-	-	-	-	-	1,571	WP 3-515
56	AX	5286986	Hydro Veg Prgrm Development - GIS	-	-	-	-	-	-	-	1,100	WP 3-515
57	AX	5287455	Dams Concrete Maintenance/Repairs	-	-	-	-	-	-	-	1,000	WP 3-449
58	AX	5287160	AM: Insp & Surv Prog - Penstocks & Sipho	-	-	-	-	-	-	-	950	
59	AX	5287169	AM: Insp & Surv Program - Canals & Flume	-	-	-	-	-	-	-	950	
60	AX	5287170	AM: Insp & Surv Program - Dam Face US&D	-	-	-	-	-	-	-	950	WP 3-463
61	AX	5287174	AM: Maintenance Design	-	-	-	-	-	-	-	950	
62	AX	5287454	Dams Concrete Drain Cleaning and Inspec	-	-	-	-	-	-	-	800	WP 3-449
63	AX	5000528	Shasta Maint Reservoirs/Dams/Waterways	1,280	1,532	2,345	2,163	2,674	1,040	1,065	1,693	WP 3-449
64	AX	5287002	Dam Safety Camera (HAWC Cameras) - Ma	-	-	-	-	-	-	-	500	

Pacific Gas and Electric Company
2027 General Rate Case
Exhibit (PG&E-5), Chapter 3
Hydro Generation Operations
Expenses by Planning Order
(Thousands of Nominal Dollars)

Line No.	MWC	Planning Order	Description	2020 Recorded Adjusted	2021 Recorded Adjusted	2022 Recorded Adjusted	2023 Recorded Adjusted	2024 Recorded Adjusted	2025 Forecast	2026 Forecast	2027 Forecast	WP Reference
65	AX	5287171	AM: Inspection Coordination Work	-	-	-	-	-	-	-	500	
66	AX	5287172	AM: L1RA portfolio risk	-	-	-	-	-	-	-	500	WP 3-463
67	AX	5287184	H&H Eng & GIS analyst Inundation Map	-	-	-	-	-	-	-	500	
68	AX	5000529	DeSabla Maint Reservoirs/Dams/Waterway	472	530	744	470	861	874	895	1,401	WP 3-449
69	AX	5015289	Camp One Maint Reservoirs/Dams/Waterw	589	1,113	838	693	1,014	1,029	1,053	1,564	
70	AX	5287214	PV Upper WS Pnstk Debris Removal	-	-	-	-	-	-	77	500	
71	AX	5284269	Asset Excellence Program Manager	-	-	-	-	427	-	-	400	
72	AX	5286997	AM: Dam Asset Risk Analysis	-	-	-	-	-	-	-	400	WP 3-463
73	AX	5286984	AM:PH Civil AF Prog Dvlp Cond Assmt	-	-	-	-	-	100	102	500	WP 3-515
74	AX	5014629	Drum Vegetation Management	1,230	927	1,018	1,121	1,215	1,234	1,263	1,665	WP 3-449
75	AX	5000531	ML Maint Reservoirs/Dams/Waterways	1,816	2,186	2,299	2,496	3,605	3,660	3,746	4,205	WP 3-449
76	AX	5000532	KCV Maint Reservoirs/Dams/Waterways	826	1,289	755	1,072	1,642	1,669	1,709	2,111	WP 3-449
77	AX	5000530	Drum Maint Reservoirs/Dams/Waterways	2,339	2,751	2,341	2,438	2,722	2,764	2,829	3,262	WP 3-449
78	AX	5020449	DeSabla NFFR Vegetation Mgmt	232	302	462	328	317	322	329	652	WP 3-449
79	AX	5245743	Hamilton Br Repair Clear Cr Undermine	-	0	-	-	-	-	-	300	
80	AX	5271438	Shasta Dam Infrastructure Mantenance	-	-	-	-	-	-	-	300	
81	AX	5286998	AM: LLO Prog Development - Cond Assess	-	-	-	-	-	-	-	300	
82	AX	5287000	AM: PI Asset Framework Maint & Expan	-	-	-	-	-	-	-	300	
83	AX	5287173	AM: Low Hazard dams STIDs	-	-	-	-	-	-	-	300	
84	AX	5000533	Helms Maint Reservoirs/Dams/Waterways	44	45	138	130	62	63	65	344	WP 3-449
85	AX	5254425	Cresta Tunnel Clean Surge Chamber	-	-	-	-	-	-	-	200	
86	AX	5286985	DSP: Specialized Inspections: Concr	-	-	-	-	-	100	102	300	WP 3-515
87	AX	5260129	Pit 6 Spilwy Aprn/Tailrce Remove Block 1	-	-	-	-	-	-	-	156	WP 3-381
88	AX	5286996	AM: 811 Program	-	-	-	-	-	150	154	250	
89	AX	5018429	Pit 1 Levee Maintenance	177	42	36	99	146	284	290	299	
90	AX	5008809	DeSabla Waterway Support	16	17	56	51	3	3	4	4	
91	AX	5021709	IRIS Licensing/Monitoring Fees/Support	2,574	276	610	750	459	466	477	491	WP 3-463
92	AX	5018935	KCV Vegetation Management	704	614	622	672	662	673	688	708	WP 3-449
93	AX	5062331	Upper Drum Water Conveyance Patching	-	-	-	295	608	618	632	650	
94	AX	5020615	AM: Water Conveyance Assessments Prgm	492	662	613	930	648	658	673	692	
95	AX	5063118	Mokelumne Water Conveyance Patching	-	-	-	103	609	619	633	651	

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Line No.	MWC	Planning Order	Description	2020 Recorded Adjusted	2021 Recorded Adjusted	2022 Recorded Adjusted	2023 Recorded Adjusted	2024 Recorded Adjusted	2025 Forecast	2026 Forecast	2027 Forecast	WP Reference
96	AX	5010036	Helms NonRqrd Facility Safety Prog	-	3	-	-	-	-	-	-	
97	AX	5010038	Drum NonReq Facility Safety Prog	-	1	-	-	-	-	-	-	
98	AX	5010039	ML NonReq Facility Safety Prog	11	2	0	-	3	-	-	-	
99	AX	5010041	Shasta NonReq Facility Safety	-	4	7	3	-	-	-	-	
100	AX	5022128	Potter Valley - Gravel Removal	5	3	-	5	-	-	-	-	
101	AX	5029209	Easement Management	-	-	11	-	-	-	-	-	
102	AX	5043750	SCV - 11587 - Hydro Construction -MWC A	58	3,665	(86)	1	3	-	-	-	
103	AX	5043756	SCV - 11634 - HYDRO PROJ MGMT - MWC A	(22)	(195)	203	115	117	-	-	-	
104	AX	5043759	SCV - 14054 - PG Contractors - MWC AX	(3)	231	272	284	112	(0)	-	-	
105	AX	5047495	Drum Spillways Maint SAIP	2	-	-	-	-	-	-	-	
106	AX	5047496	Motherlode Spillways Maint SAIP	-	3	2	-	-	-	-	-	
107	AX	5051988	Dam Safety Expense	543	1,045	2	-	-	-	-	-	
108	AX	5053589	AM: CO2 Removal Program	124	(5)	-	-	-	-	-	-	
109	AX	5063117	Stanislaus Water Conveyance Patching	2	-	1	1	-	-	-	-	
110	AX	5064755	SCV - 11588 - HydrConstCivl North-MWC A	-	-	-	(0)	(0)	-	-	-	
111	AX	5064757	SCV - 15344 - HydroConstShastaE&M-MW	-	-	-	(24)	83	-	-	-	
112	AX	5064758	SCV - 14131 - HydrConstDrum -MWC AX	-	-	-	13	(139)	-	-	-	
113	AX	5064759	SCV - 14132 - HydroConstSouth -MWC AX	-	-	-	(9)	66	-	-	-	
114	AX	5064760	SCV - 14134 -HydroConstMotherlode-MW	-	-	-	(10)	75	-	-	-	
115	AX	5202233	Upper Drum Conveyance Patching Annual	137	205	161	-	-	-	-	-	
116	AX	5215601	Lake valley Conveyance Patching Semi Anr	22	-	-	4	-	-	-	-	
117	AX	5215872	Almanor Dredge Prattville Intake	2	3,393	40	-	-	-	-	-	
118	AX	5236324	Cresta Repair Tailrace Erosion	36	62	412	2	-	-	-	-	
119	AX	5241206	Drum Canal undercrossing Inspection	-	6	-	-	-	-	-	-	
120	AX	5245423	Salt Springs Dam Radial Gate Repair	0	-	-	-	-	-	-	-	
121	AX	5245426	Spaulding Dam 1 Patching	811	1	-	-	-	-	-	-	
122	AX	5253553	Volta 1 Lake Grace Embankment Repairs	852	54	-	-	-	-	-	-	
123	AX	5253874	Caribou 1 Intake Repair Walkway Anchor	144	(336)	0	(0)	-	-	-	-	
124	AX	5254422	Grizzly Forebay Surface Debris Removal	1	1	1	-	-	-	-	-	
125	AX	5254424	Grizzly Frby Remove Debris Subsurface	2,166	-	-	-	-	-	-	-	
126	AX	5254494	Caribou 1 Pstk Rock Anchor Liftoff Test	1	-	-	-	-	-	-	-	

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127	AX	5254653	Mok - Lwr Blue - Repair M-3 Weir	13	(4)	-	-	-	-	-	-	
128	AX	5255894	South Yuba Conveyance Patching Annual	412	377	493	466	4	-	-	-	
129	AX	5255895	Phoenix Main Tuolumne Flume Maint 2017	12	5	-	-	-	-	-	-	
130	AX	5256094	Lower Drum Conveyance Patching Annual	293	229	240	0	-	-	-	-	
131	AX	5256632	Pit 5 PH Dredge Tailrace 2017 Storm Dmge	(3)	3	-	-	-	-	-	-	
132	AX	5257952	Volta 1 Lake Nora Embankment Repairs	553	39	-	-	-	-	-	-	
133	AX	5258066	PV Scott Dam Recoat US Slide Gates	1,069	357	-	-	-	-	-	-	
134	AX	5258852	Poe Dam Repair Toe Voids	45	55	10	-	-	-	-	-	
135	AX	5258853	DeSabla Forebay LLO Abandon AoA	19	0	-	-	-	-	-	-	
136	AX	5260054	Upper Wise Tunnel 8 Grouting	10	-	-	-	-	-	-	-	
137	AX	5260055	Lower Wise Tunnel 5 & 6 Patching	-	-	-	-	263	-	-	-	
138	AX	5260093	Wise Forebay Tree Removal/Rebuild Berm	319	87	106	534	5	-	-	-	
139	AX	5260126	Pit 7 U1 Recoat Intake Gates	-	102	1	-	-	-	-	-	
140	AX	5260128	Pit 7 Unit 2 Recoat Intake Gates	-	87	0	-	-	-	-	-	
141	AX	5260382	Helms Penstock Field Weld Reinspections	-	135	637	-	-	-	-	-	
142	AX	5260994	Fordyce Paint Radial Gates 2019	67	196	-	-	-	-	-	-	
143	AX	5261073	PV Evaluate Old Intake	19	3	-	-	-	-	-	-	
144	AX	5261876	Tiger Creek Reg Spillway Repair SAIP	50	2	-	-	-	-	-	-	
145	AX	5261877	Grizzly Cr Xing Assess and Repair Tunnel	12	83	228	60	49	-	-	-	
146	AX	5262369	Volta 1 Lake Nora Repair Spill Basin	27	-	-	-	-	-	-	-	
147	AX	5263072	Grizzly FB Dam Alt Analysis	60	473	64	21	-	-	-	-	
148	AX	5263074	Cresta Repair 24" Bypass Valve Leak	(0)	-	-	-	-	-	-	-	
149	AX	5263207	Kelly Lake (Drum) Remove Tree Stumps	5	45	(4)	7	-	-	-	-	
150	AX	5263402	RCC Dams LLO Restoration Evaluation	36	12	4	199	(66)	-	-	-	
151	AX	5263403	Caribou 2 Penstock Modify Rock Bolts	13	9	-	-	-	-	-	-	
152	AX	5263407	Bucks Creek Pnstk Erosion Mitigation	41	450	517	0	241	-	-	-	
153	AX	5263732	DeSabla 2018 Camp Fire Response	425	(40)	0	-	-	-	-	-	
154	AX	5264902	Tiger Creek AB Repair Structural Members	1,034	123	-	-	-	-	-	-	
155	AX	5265412	Drum - Canal Escape Aid Design/Eval	50	(9)	0	-	-	-	-	-	
156	AX	5266012	Cape Horn Dam Fish Screen Ladder AoA	0	-	-	-	-	-	-	-	
157	AX	5267076	Pit 3 Refurbish LLO No. 1 (expense)	31	127	-	-	-	-	-	-	

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158	AX	5267516	McCloud Dam LLO Hydraulic Leak Repair	(355)	-	-	-	-	-	-	-	
159	AX	5267522	Upper Blue Lake Dam SWPPP BMPs	-	5	41	5	0	10	-	-	
160	AX	5267538	DeSabla FB Slope Erosion Control DOE	78	35	-	-	-	-	-	-	
161	AX	5267612	DeSabla Repair Fishing Platform	62	30	-	-	-	-	-	-	
162	AX	5267614	Lovelock Tunnel Repair Liner Boards	92	153	-	-	-	-	-	-	
163	AX	5267615	Canyon Dam Evaluate Outlet Structure	35	75	34	-	-	-	-	-	
164	AX	5269295	Pit 1 Forebay Spillway DSE Support SAIP	6	-	-	-	-	-	-	-	
165	AX	5269441	Pit 6 Dam Repair Drains/Piezos	1	-	-	-	-	-	-	-	
166	AX	5269442	Pit 7 Dam Repair Drains/Piezos	242	17	-	-	-	-	-	-	
167	AX	5270152	Pit 4 Dam Steel Footbridge AoA	-	-	4	55	-	-	-	-	
168	AX	5270896	Coleman Forebay Install Seepage Monitor	-	24	-	-	-	-	-	-	
169	AX	5271254	JBB IC Dam LLO Temp Hydraulic Hose	-	213	12	-	-	-	-	-	
170	AX	5271349	Relief Dam - Maintain U/S Liner	-	45	-	-	-	-	-	-	
171	AX	5271414	Spaulding Dam Radial Gate Repair	-	18	8	28	5	-	-	-	
172	AX	5271415	Lyons Dam Radial Gate Repair	-	1	-	-	-	-	-	-	
173	AX	5271416	Wise Forebay Increase Flow Capacity	-	178	21	0	-	-	-	-	
174	AX	5271419	Tgr Crk AB Eval Radial Gates Hoists Auto	-	58	7	-	-	-	-	-	
175	AX	5271456	Helms Tunnel Scaling	-	-	-	-	79	-	-	-	
176	AX	5271458	Kerckhoff 2 Tunnel Drain	14	234	0	-	-	-	-	-	
177	AX	5271463	Courtright Dam Paprapet Manway Fill	-	45	-	-	-	-	-	-	
178	AX	5271464	Wishon Dam Parapet Manway Fill	-	65	-	-	-	-	-	-	
179	AX	5273492	Hendrick Canal Repair Liner	-	54	-	-	-	-	-	-	
180	AX	5275752	Upper Peak Water Pump Rental	-	146	(0)	-	-	-	-	-	
181	AX	5278352	Balch Diversion Dam Weep Hole Cleaning	-	-	24	583	-	-	-	-	
182	AX	5279272	Bucks Dam Spillway Repair Bridge BR 18	-	-	-	47	-	-	-	-	
183	AX	5279274	RC Dam Drum Gate Chamber Sediment Rn	-	-	-	122	1	-	-	-	
184	AX	5279292	Rock Cr South Wing Aux Dam Tree Root Rm	-	-	-	4	12	-	-	-	
185	AX	5279592	Milk Ranch Crk Spawn Ch Rest & Sed Prev	-	-	-	265	7	-	-	-	
186	AX	5279599	Courtright Parapet Wall Concrete Repair	-	-	50	-	-	-	-	-	
187	AX	5281232	Helms U2 Pnstk Field Weld Reinspections	-	-	-	-	190	-	-	-	
188	AX	5281233	Helms U3 Pnstk Field Weld Reinspections	-	-	-	-	186	-	-	-	

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189	AX	5281552	Helms DTG Inspection & Weld Repairs	-	-	-	-	287	-	-	-	
190	AX	5282972	AM: Canal Blitz	-	-	-	490	6,171	3,000	-	-	WP 3-515
191	AX	5283153	Wishon Dam Recoat Radial Gates GIR	-	-	-	-	12	-	-	-	
192	AX	5283432	Cresta Dam Drum Gate Chamber Dredging	-	-	-	-	2	-	-	-	
193	AX	5283492	Courtright Parapet Wall Repair	-	-	-	77	-	-	-	-	
194	AX	5283721	Butte Canal Restoration Exp	-	-	-	3,829	876	-	-	-	
195	AX	5283812	Courtright Dam Concrete Liner Repairs	-	-	-	255	0	-	-	-	
196	AX	5284452	Spaulding LLO Repair Crack	-	-	-	-	0	-	-	-	
197	AX	5286154	Rodent Abatement Program	-	-	-	-	46	-	-	-	
198	AX	5286293	Exponent Butte Canal RCE	-	-	-	-	398	-	-	-	
199	AX	5286335	PV Repair Upr & Lwr Wood Stave Pnstk	-	-	-	-	4	-	-	-	
200	AX	5286572	PG Level of Effort	-	-	-	-	1,743	-	-	-	WP 3-515
201	AX	5265772	M12 Bridge Install Gate Support	-	-	-	-	16	-	-	-	
202	AX	5270899	Pit 1 PH40/Fall River Weir Repr Spalling	-	-	-	-	14	-	-	-	
203	AX	5274753	Volta 1 Lake Grace Seepage Mitigation	-	-	-	-	1	-	-	-	
204	AX	5279273	Bucks Storage Dam Rpr Upstream Spalling	-	-	-	43	67	-	-	-	
205	AX	5279281	PV Scott Dam Inspect Spillway Toe Drains	-	-	-	31	89	-	-	-	
206	AX	5280712	South PH Repair Penstock Strap	-	-	-	-	5	-	-	-	
207	AX	5284055	Helms –KI-17 Repair Erosion Undercutting	-	-	-	1	19	-	-	-	
208	AX	5286173	Penstock Inspection Program	-	-	-	-	417	1,100	-	-	WP 3-515
209	AX	5286176	Water Conveyance Inspections	-	-	-	-	109	900	-	-	WP 3-515
210	AX	5286987	Soil Moisture	-	-	-	-	-	350	-	-	
211	AX	5286988	PGen Road Program Insp	-	-	-	-	-	700	-	-	
212	AX	5021849	Helms Vegetation Management	183	313	220	187	217	221	226	232	WP 3-449
213	AX	5020617	AM: Penstock Program	2,135	1,042	1,555	2,021	2,354	2,390	2,446	2,514	
214	AX	5015292	Manton Main Reservoirs/Dams/Waterways	525	721	900	934	471	2,016	2,064	2,121	
215	AX	5009055	Potter Valley Maintain Dams & Reservoirs	606	382	537	499	479	486	497	511	WP 3-449
216	AX	5020624	AM: Pressure Boundaries Program	299	371	345	312	258	262	268	275	
217	AX	5020450	Camp One Vegetation Mgmt	609	54	493	694	357	362	371	381	
218	AX	5014630	ML Vegetation Management	977	938	957	993	1,083	1,099	1,125	1,156	WP 3-449
219	AX	5020623	AM: Cableways Program	98	144	104	92	88	89	91	93	

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220	AX	5062332	Lower Drum Water Conveyance Patching	-	-	-	296	393	399	408	419	
221	AX	5209122	DeSabla Repair Butte Canal	-	-	-	-	-	-	200	200	
222	AX	5004009	Non Req Facility Safety Program	96	1,055	442	938	535	400	300	200	WP 3-463
223	**AX**	**AX Total**		**27,996**	**29,791**	**21,948**	**29,895**	**35,932**	**31,109**	**25,782**	**51,002**	Sum of Lines 52-222
224	AX											
225	AY	5047952	HL: Zebra Quagga Prevention Program	112	77	101	145	175	178	182	187	
226	**AY**	**AY Total**		**112**	**77**	**101**	**145**	**175**	**178**	**182**	**187**	Sum of Lines 225-225
227	**AY**											
228	BC	5000586	NID YB Perform Reimbursable Work	-	-	(656)	-	-	-	-	-	
229	BC	5001764	PCWA Perform Reimburs Work-Irrig Distr	(8)	(1)	-	-	-	-	-	-	
230	BC	5004951	SID Perform Reimbusable Work	(5)	0	7	41	(36)	(0)	-	-	
231	BC	5012600	Grizzly Powerhouse O&M	35	(255)	3	233	(57)	-	-	-	
232	BC	5030729	Grizzly (Reimbursable Capital Work)	(123)	123	1	80	(82)	-	-	-	
233	BC	5243037	CalTrans Bridge Replacement Support	(13)	(2)	-	-	-	-	-	-	
234	BC	5271444	Chili Bar AT&T Line - Reimbursable	-	5	2	-	-	-	-	-	
235	**BC**	**BC Total**		**(115)**	**(129)**	**(643)**	**353**	**(175)**	**(0)**	**-**	**-**	Sum of Lines 228-234
236	**BC**											
237	EP	5001136	DeSabla Manage Land Rights	640	407	890	947	777	789	807	830	
238	EP	5001493	KCV Land Right Management Services	309	394	286	318	400	407	416	428	
239	EP	5001497	Drum Manage Land Rights	199	151	180	179	193	196	200	206	
240	EP	5008821	Shasta Land Rights Support	220	219	344	312	350	355	363	374	
241	EP	5009930	ML Manage Land Rights	76	65	92	120	111	113	115	118	
242	EP	5009931	Potter Valley Land Rights	17	51	95	64	96	97	100	102	
243	EP	5010249	Helms Manage Land Rights	0	0	0	0	-	-	-	-	
244	**EP**	**EP Total**		**1,461**	**1,287**	**1,887**	**1,940**	**1,926**	**1,956**	**2,002**	**2,058**	Sum of Lines 237-243
245	**EP**											
246	IG	5018815	Des Cent Pre/Post License Withdrawal	17	19	-	-	-	-	-	-	
247	IG	5020069	Chili Bar LC Execute L&EM - FERC 2155	54	(8)	-	-	-	-	-	-	

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248	IG	5021931	UNFFR LC-Land Stand	-	-	-	-	-	-	-	1,468	
249	IG	5044150	PoeLC-Implement Land Dept Plans	2	18	24	10	-	-	-	-	
250	IG	5044152	PoeLC-Implement Plans for Bio Measures	362	582	752	636	1,083	500	500	-	
251	IG	5046449	Poe LC - New License Conditions	43	49	26	77	30	5	5	-	
252	IG	5046516	PoeLC-Implement Historic Properties Plan	-	-	-	1	39	18	19	-	
253	IG	5056356	ML DSOD Fees	488	429	524	564	588	597	614	637	
254	IG	5056357	Shasta DSOD Fees	380	319	394	424	442	449	450	463	
255	IG	5056358	Drum DSOD Fees	430	311	392	413	431	437	435	466	
256	IG	5056359	DeSabla DSOD Fees	331	295	345	371	387	393	409	428	
257	IG	5056360	KCV DSOD Fees	146	142	176	189	198	201	205	231	
258	IG	5056361	Helms DSOD Fees	185	157	193	208	217	220	205	235	
259	IG	5056362	Potter Valley DSOD Fees	18	51	62	67	70	71	72	72	
260	IG	5056363	DeSabla FERC Fees	1,872	2,211	2,403	2,519	2,914	2,959	2,456	2,321	
261	IG	5056364	Helms FERC Fees	1,850	1,960	2,311	2,672	2,940	2,985	2,763	2,710	
262	IG	5056365	KCV FERC Fees	1,604	1,775	1,780	2,092	2,239	2,273	2,252	2,162	
263	IG	5056366	Shasta FERC Fees	2,051	2,417	2,531	2,726	3,071	3,118	2,763	2,631	
264	IG	5056367	ML FERC Fees	959	980	1,029	1,206	1,337	1,358	1,331	1,276	
265	IG	5056368	Drum FERC Fees	605	445	640	670	717	728	921	865	
266	IG	5056409	Potter Vly FERC Fees	83	65	72	75	78	79	102	109	
267	IG	5064249	BucksCreek LC O&M	-	-	-	1	-	-	-	-	
268	IG	5064250	BucksCreek Biological LC	-	-	0	570	562	-	-	-	
269	IG	5064251	BucksCreek LC Land Management	-	-	2	1,555	1,428	-	-	-	
270	IG	5215606	Drum-Spauld License Conditions	-	-	-	-	-	-	-	399	
271	IG	5215765	PoeLC-Develop Plans for Bio Measures	56	0	-	-	-	-	-	-	
272	IG	5215768	McCloud- Pit License Condit	-	-	-	-	-	-	-	166	
273	IG	5215854	PoeLC-New Lic Plans, Drawing updates	70	19	-	-	-	-	-	-	
274	IG	5232293	Des Cent LC - Implementation Expense	0	-	-	-	-	-	-	-	
275	IG	5236355	PoeLC-Prepare Land Dept Plans	46	(0)	-	-	-	-	-	-	
276	IG	5236356	PoeLC-License Management	159	39	22	0	-	-	-	-	
277	IG	5236367	UNFFR LC-Bio Mon Spec	-	-	-	-	-	-	-	1,200	WP 3-422
278	IG	5236368	UNFFR LC-Bio Mon Stand	-	-	-	-	-	-	-	1,291	WP 3-422

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279	IG	5236369	UNFFR LC-Land Spec	-	-	-	-	-	-	-	450	
280	IG	5261975	Poe LC- Prepare Historic Properties Plan	49	54	6	0	-	-	-	-	
281	IG	5264542	Potter Valley PM Closeout	4	2	1	-	-	-	-	-	
282	IG	5267525	Powerhouse Decommissioning Studies	(0)	-	-	-	-	-	-	-	
283	IG	5272032	Drum Spillways FSP Engr SAIP	565	955	84	26	487	50	50	-	WP 3-381
284	IG	5272053	DeSabla Spillways FSP Engr SAIP	344	1,337	283	0	-	767	100	-	WP 3-381
285	IG	5272054	Motherlode Spillways FSP Engr SAIP	123	164	181	107	100	50	50	-	WP 3-381
286	IG	5272055	Relief Spillway Repair SAIP	29	2	-	-	-	-	-	-	
287	IG	5272056	Lake Almanor Spillway Repairs SAIP	99	59	56	170	-	-	-	-	
288	IG	5272057	Cape Horn Dam Spillway Repair SAIP	103	5	2	-	-	-	-	-	
289	IG	5272058	Philbrook Spillway Repairs SAIP	37	147	15	1	-	-	-	-	
290	IG	5272060	Round Valley Spillway Repairs SAIP	80	12	-	-	-	-	-	-	
291	IG	5272061	Shasta Spillways FSP Engr SAIP	747	689	519	198	11	50	50	-	WP 3-381
292	IG	5272062	Kings Crane Spillways FSP Engr SAIP	32	315	3	226	345	50	-	-	WP 3-381
293	IG	5272063	Salt Springs Spillway Repair SAIP	119	168	180	(409)	(48)	-	-	-	
294	IG	5272064	North Battle Creek Spillway Repairs SAIP	32	65	202	7	-	-	-	-	
295	IG	5272066	Pit 1 Forebay Spillway Repairs SAIP	53	146	177	181	12	-	-	-	
296	IG	5272068	Pit 5 Spillway Repair Open Conduit SAIP	-	-	206	795	248	-	-	-	
297	IG	5272069	Macumber Dam Spillway Repair SAIP	32	61	245	5	-	-	-	-	
298	IG	5272071	Drum Forebay Spillway Repair SAIP	82	1	-	-	-	-	-	-	
299	IG	5272075	Upper Peak Lake Spillway Repair SAIP	60	7	-	-	-	-	-	-	
300	IG	5272076	PV Scott Dam Spillway Repairs SAIP	20	59	771	14	-	-	-	-	
301	IG	5272077	Inundation Maps	588	59	8	53	57	500	500	3,000	WP 3-210
302	IG	5272092	Helms Spillways FSP Engr SAIP	101	212	17	-	-	-	-	-	
303	IG	5272592	Belden Forebay Spillway Repairs SAIP	1,007	110	-	-	-	-	-	-	
304	IG	5272593	Bucks Storage Spillway Repairs SAIP	9	0	-	-	-	-	-	-	
305	IG	5272594	Butt Valley Spillway Repairs SAIP	10	0	-	-	-	-	-	-	
306	IG	5272595	Halsey Afterbay Spillway Repair SAIP	90	55	30	0	0	-	-	-	
307	IG	5272596	McCloud Spillway Slide Evaluation SAIP	59	24	-	-	-	-	-	-	
308	IG	5272652	Power Gen Tree Mortality (VMBA)	1,461	866	1,195	1,765	2,443	1,400	1,000	3,000	WP 3-425
309	IG	5277572	MCPIT-LC LIC Proj Mgt & Dev Plans	-	-	-	-	-	-	-	546	

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310	IG	5277573	MCPIT-LC Dev SA Land Plans	-	-	-	-	-	-	-	39	
311	IG	5277574	MCPIT-LC LEM Proj Mgt & Dev Plans	-	-	-	-	-	-	-	260	
312	IG	5277575	MCPIT-LC Impl SA & LC Road Plans	-	-	-	-	-	-	-	799	
313	IG	5277576	MCPIT-LC Impl Rec Plans	-	-	-	-	-	-	-	500	
314	IG	5277577	MCPIT-LC Impl Bio Plans & ESA Ann Rpt	-	-	-	-	-	-	-	2,693	
315	IG	5277582	MCPIT-LC Impl Coarse Sediment Mgt Pln	-	-	-	-	-	-	-	653	
316	IG	5277583	MCPIT-LC Impl Historic Prop Mgt Pln	-	-	-	-	-	-	-	633	
317	IG	5278873	Wise Forebay Flow Capacity SAIP	-	-	10	55	78	-	-	-	
318	IG	5278874	BucksCreek LC TMP Culvert Unplugging NE	-	-	-	19	27	-	207	-	
319	IG	5278972	60kV Deer Creek Trans Line Mgmt Plan	-	-	22	358	222	-	-	-	
320	IG	5279263	BucksCreek LC Land Management	-	-	-	-	-	1,400	481	-	WP 3-190
321	IG	5279264	BucksCreek Biological LC	-	-	-	-	-	400	295	-	
322	IG	5279265	BucksCreek LC Biological Specific	-	-	1	26	235	300	408	-	WP 3-190
323	IG	5279266	BucksCreek LC O&M	-	-	-	-	-	300	366	-	
324	IG	5279267	BucksCreek LC Land	-	-	1	90	287	30	34	-	
325	IG	5279268	BucksCreek LC Admin Specific	-	-	1,857	198	68	35	35	-	
326	IG	5279332	Potter Valley License Surrender	-	-	5,982	913	2,436	1,311	1,500	2,000	WP 3-374
327	IG	5279912	Battle Creek License Surrender	-	-	10	91	331	500	500	1,000	WP 3-181
328	IG	5279992	FERC Security Improvements - NEE	-	-	3	89	297	1,000	1,000	-	WP 3-452
329	IG	5280313	Kilarc Cow Decommissioning	-	-	-	-	-	-	-	16,971	WP 3-299
330	IG	5280345	BucksCreek LC MRC Div Safe&Aesth Repai	-	-	-	34	41	-	-	-	
331	IG	5280552	FERC Security Improv - Desabla - Exp	-	-	-	25	150	250	-	-	WP 3-452
332	IG	5280553	FERC Security Improv - ML - Exp	-	-	-	54	96	100	-	-	WP 3-452
333	IG	5280554	FERC Security Improv - Drum - Exp	-	-	-	102	282	100	-	-	WP 3-452
334	IG	5280555	FERC Security Improv - Southern- Exp	-	-	-	6	33	100	-	-	WP 3-452
335	IG	5280556	FERC Security Improv - Shasta - Exp	-	-	-	21	59	100	-	-	WP 3-452
336	IG	5281832	DSP: Seismic Risk Studies	-	-	-	-	632	450	461	-	WP 3-463
337	IG	5281833	DSP: Flood Risk Studies	-	-	-	147	569	150	150	-	WP 3-463
338	IG	5281834	DSP: Life Loss Risk Studies	-	-	-	31	482	150	150	-	WP 3-463
339	IG	5281872	Butt Valley Spillway Repairs (Exp) SAIP	-	-	-	46	221	-	-	-	
340	IG	5282772	Relief Spillway Patching SAIP	-	-	-	88	11	-	-	-	

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341	IG	5283436	Phoenix Relicensing- Expense LC	-	-	-	-	-	200	400	448	WP 3-322
342	IG	5283938	Crane Valley Dam Repairs - SAIP	-	-	-	1	5	-	-	-	
343	IG	5285452	DSP: Seismic Risk Program	-	-	-	-	210	-	-	-	WP 3-463
344	IG	5285453	DSP: Life Loss Risk Program	-	-	-	-	145	-	-	-	WP 3-463
345	IG	5285454	DSP: Flood Risk Program	-	-	-	-	19	-	-	-	
346	IG	5285752	BucksCreek LC TMP Gravel Augmentation	-	-	-	-	-	260	30	-	
347	IG	5286332	Bucks Storage Repair Spillway Joints & C	-	-	-	-	3	220	50	-	WP 3-381
348	IG	5287006	Wishon Spillway Repair SAIP	-	-	-	-	-	50	50	-	WP 3-381
349	IG	5287008	Drum Forebay Repr Spillway Joints SAIP	-	-	-	-	-	150	100	272	WP 3-381
350	IG	5287009	Inskip Dam Post Removal Monitor Veg	-	-	-	-	-	2	132	105	
351	IG	5287168	Kerckhoff 1 &2 Relicensing - Expense LC	-	-	-	-	-	-	-	2,000	WP 3-295
352	IG	5287534	DSP: Comprehensive Assessments	-	-	-	-	1,206	-	950	-	WP 3-463
353	IG	5287552	Centerville Dvlpmt/Butte Canal Surrender	-	-	-	-	-	-	-	500	
354	IG	5054651	WF OII Credit Reserve - Generation	393	-	-	-	-	-	-	-	
355	IG	5265052	EH Drum Common WSIP/CWIP	0	-	-	-	-	-	-	-	
356	IG	5265053	EH KingsCrane Common WSIP/CWIP	4	-	-	-	-	-	-	-	
357	IG	5265054	EH Feather Common WSIP/CWIP	(10)	-	-	-	-	-	-	-	
358	IG	5265058	EH Mokelumne Common WSIP/CWIP	5	-	-	-	-	-	-	-	
359	IG	5270132	DeSabla Butte County Fire Ords (FRMMA)	676	99	151	269	240	170	200	-	
360	IG	5273103	PG 2021 Enhanced Switchyard Insp (FRMM	-	858	(3)	-	-	-	-	-	
361	IG	5273153	PG 2021 En Switchyrd Insp Repair (FRMMA	-	623	326	1,108	-	-	-	-	
362	IG	5273352	PG 2021 HFTD Enhance Ins/Rep PMO (FRM	-	313	497	259	(3)	-	-	-	
363	IG	5273466	PG 2021 Switchyard Defensible Sp. WMPM	-	2,054	41	0	-	-	-	-	
364	IG	5273736	PG 2021 Post Mar En Swtyrd Insp (WMPMA	-	535	-	-	-	-	-	-	
365	IG	5273816	PG 2021 Post-March En Insp Repair WMPM	-	178	96	2	-	-	-	-	
366	IG	5273934	PG 2021 Def Space Anml Abtmnt Insp WMF	-	-	24	-	-	-	-	-	
367	IG	5274173	Drum Area County Ords Fire Prev (FRMMA)	-	469	295	221	251	325	325	-	
368	IG	5274292	PG Switchyard Wildfire Tools/Box (FRMMA)	-	15	-	-	-	-	-	-	
369	IG	5275012	PG 2022 Enhanced Swtyrd Insp (WMPMA)	-	-	886	-	-	-	-	-	
370	IG	5275013	PG 2022 Enhanced Insp Repair WMPMA	-	-	1,088	441	1	-	-	-	
371	IG	5275014	PG 2022 Switchyard Defensible Sp. WMPM	-	-	1,344	(17)	4	-	-	-	

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372	IG	5275015	PG 2022 HFTD Enhance Ins/Rep PMO WMP	-	-	29	-	-	-	-	-	
373	IG	5275017	PG 2023 Enhanced Swtyrd Insp (WMPMA)	-	-	-	646	-	-	-	-	
374	IG	5275018	PG 2024 Enhanced Swtyrd Insp (WMPMA)	-	-	-	27	2,247	-	1,651	-	WP 3-429
375	IG	5275021	PG 2023 Enhanced Insp Repair WMPMA	-	-	-	352	250	-	-	-	
376	IG	5275022	PG 2024 Enhanced Insp Repair WMPMA	-	-	-	-	108	200	250	-	
377	IG	5275074	PG 2023 Switchyard Defensible Sp. WMPM	-	-	-	1,252	41	-	-	-	
378	IG	5275075	PG 2024 Switchyard Defensible Sp. WMPM	-	-	-	-	1,134	-	-	-	
379	IG	5275076	PG 2025 Switchyard Defensible Sp. WMPM	-	-	-	-	-	1,100	-	-	WP 3-429
380	IG	5275077	PG 2026 Switchyard Defensible Sp. WMPM	-	-	-	-	-	-	1,024	-	WP 3-429
381	IG	5277058	PG 2022 - Tags from 2019 WSIP Insp WMPI	0	2	53	7	-	-	-	-	
382	IG	5277152	PG 2022 Animal Abatement Assess. (WMPI	-	-	231	2	4	-	-	-	
383	IG	5277512	PG Recl Pre-2022 WSIP Base Exp to WMPM	-	-	1,925	(32)	-	-	-	-	
384	IG	5287003	PG 2025 Enhanced Insp Repair WMPMA	-	-	-	-	-	250	150	-	
385	IG	5287004	PG 2025 Enhanced Swtyrd Insp (WMPMA)	-	-	-	-	-	2,100	-	-	WP 3-429
386	IG	5287005	PG 2025 HFTD Enhance Ins/Rep PMO WMP	-	-	-	-	-	150	-	-	
387	IG	5287158	PG 2026 HFTD Enhance Ins/Rep PMO WMP	-	-	-	-	-	-	150	-	
388	**IG**	**IG Total**		**18,812**	**22,995**	**32,728**	**27,117**	**34,850**	**31,111**	**28,301**	**55,000**	Sum of Lines 246-387
389	**IG**											
390	KG	5000485	Helms Manage Fire Protection Equipment	-	-	1	-	-	-	-	-	
391	KG	5000512	Shasta Operate Generation Facilities	4,982	5,036	5,398	6,132	6,125	6,046	6,188	8,274	
392	KG	5000513	DeSabla Operate Generation Facilities	6,172	6,004	6,676	6,874	6,666	6,526	6,679	8,952	
393	KG	5000514	Drum Operate Generation Facilities	5,979	5,617	5,748	6,418	6,696	6,799	6,958	8,718	
394	KG	5000515	ML Operate Generation Facilities	2,924	2,848	2,854	2,646	2,461	2,499	2,557	3,672	
395	KG	5000516	KCV Operate Generation Facilities	1,244	1,198	1,312	1,481	1,409	1,405	1,438	2,696	
396	KG	5000517	Helms Operate Generation Facilities	2,005	1,970	2,075	2,685	1,999	1,992	2,039	2,617	
397	KG	5000610	Helms Operate Network Sys	-	-	2	-	-	-	-	-	
398	KG	5000640	DeSabla Manage Waste Disposal/Transpor	26	8	12	13	-	-	-	-	
399	KG	5000643	KCV Manage Haz Waste Disp/Transp	0	-	-	0	-	-	-	-	
400	KG	5000644	Helms Manage Haz Waste Disp/Transp	3	2	2	1	1	1	1	1	
401	KG	5001614	Water Mgmt. Contracts	1,253	420	245	488	740	752	769	791	
402	KG	5001623	HC: Manage Partnership Opns	(87)	1	3	-	-	-	-	-	

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403	KG	5001636	Power Gen Safety Committee	32	55	1	93	515	523	535	550	
404	KG	5001777	Manage Technical Services	892	908	791	736	920	934	956	983	
405	KG	5008269	Helms Manage Safety	40	36	35	121	97	137	140	144	
406	KG	5008270	KCV Manage Safety	62	1,222	21	10	46	47	48	49	
407	KG	5008810	ML Manage Safety	23	146	377	370	922	936	958	985	
408	KG	5008811	Shasta Manage Safety	8	5	2	83	53	226	232	238	
409	KG	5008812	DeSabla Manage Safety	88	40	23	74	16	74	75	77	
410	KG	5009209	KCV Water Mgmt	194	41	6	-	-	-	-	-	
411	KG	5011009	KCV Helicopter Charges	285	261	302	424	431	438	448	460	
412	KG	5011013	DeSabla Helicopter Charges	4	0	2	-	-	178	182	187	
413	KG	5012590	Potter Valley Operate PH	635	823	751	922	858	871	892	916	
414	KG	5012613	Crane Valley Operate Gen Fac	1	-	13	-	-	-	-	-	
415	KG	5013155	Shasta Hydrographic Operations	249	95	2	-	-	-	-	-	
416	KG	5013156	DeSabla Oper Res/Dams/Waterways	12	33	78	7	10	16	17	17	
417	KG	5013162	KCV FOC Switching Center Support	717	927	969	1,272	1,290	1,310	1,341	1,378	
418	KG	5015790	ML Moke Cloud Seeding-Weather Mod	103	206	265	158	215	218	223	229	
419	KG	5018937	Training and Quals	900	689	46	-	-	-	-	-	
420	KG	5018938	Corrective Action Program	158	-	-	-	-	-	-	-	
421	KG	5020613	AM: Arc Flash Hazard Assessment Progran	53	65	59	109	195	198	202	208	
422	KG	5020618	AM: Grounding Program	54	102	10	106	219	222	227	234	
423	KG	5024830	AM: HV Breaker Program	18	0	1	0	-	-	-	27	
424	KG	5024831	AM: Exciter Program	-	-	-	8	-	-	-	100	
425	KG	5025709	Electric Safety Program	214	204	190	244	276	280	287	295	
426	KG	5028049	DeSabla Hydrographer Support	32	2	-	-	-	-	-	-	
427	KG	5028370	DeSabla Crane Annual Certification	21	-	7	6	-	-	-	-	
428	KG	5032509	Power Gen Eletric Meter Charges	271	111	2	2	2	-	-	-	
429	KG	5036012	Project Execution - ATS Support	-	95	31	7	49	49	51	52	
430	KG	5037149	HC Hazardous Waste-Matl Mgmt	439	316	448	516	588	597	611	628	
431	KG	5043751	SCV - 11591 - Shasta Hydro O&M - MWC KC	299	495	171	(53)	60	-	-	-	
432	KG	5043752	SCV - 11597 - DeSabla Hydro O&M - MWC I	655	448	78	(278)	(56)	-	-	-	
433	KG	5043753	SCV - 11605 - Central Hydro O&M - MWC K	(687)	7	1	1	-	-	-	-	

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434	KG	5043754	SCV - 11616 - KCV Hydro O&M - MWC KG	472	392	405	(115)	52	-	-	-	
435	KG	5043755	SCV - 11623 - Helms Hydro O&M - MWC KG	344	287	337	(127)	66	-	-	-	
436	KG	5043757	SCV - 11636 - Hydro Tech Svcs - MWC KG	148	(5)	(17)	2	(28)	-	-	-	
437	KG	5045397	SCV - 11581 - PG Compliance - MWC KG	(169)	(103)	(80)	25	(52)	-	-	-	
438	KG	5047178	FERC Security Plan	478	252	196	85	22	375	384	1,800	WP 3-452
439	KG	5051013	EH FERC 2661 Com Defensible Space	7	-	-	-	-	-	-	-	
440	KG	5051014	EH FERC 233 Com Defensible Space	58	-	-	-	-	-	-	-	
441	KG	5051017	EH Shasta Common Defensible Space	39	(1)	-	-	-	-	-	-	
442	KG	5051019	EH Drum Common Defensible Space	75	10	-	-	-	-	-	-	
443	KG	5051022	EH Kings Crane Common Defensible Space	60	2	-	-	-	-	-	-	
444	KG	5051025	EH Feather Common Defensible Space	35	7	-	-	-	-	-	-	
445	KG	5051028	EH Butte Common Defensible Space	20	(1)	1	-	-	-	-	-	
446	KG	5051049	EH Manton HQ Common Defensible Space	18	-	-	-	-	-	-	-	
447	KG	5051050	EH Stanislaus Common Defensible Space	16	-	-	-	-	-	-	-	
448	KG	5051051	EH Mokelumne Common Defensible Space	30	1	-	-	-	-	-	-	
449	KG	5052002	DeSabla Area 3rd Party Support	57	68	152	158	143	145	148	152	
450	KG	5052293	SCV - 15988 - Drum Hydro O&M - MWC KG	845	276	238	(20)	100	-	-	-	
451	KG	5052294	SCV - 15989 - ML Hydro O&M - MWC KG	568	211	393	(87)	(239)	-	-	-	
452	KG	5052296	PCC 15990 - PGen CAP/GSS/OR	432	781	-	-	-	-	-	-	
453	KG	5053105	PCC 18010 - PGEN Quality Verification	321	784	880	421	901	915	937	963	
454	KG	5053217	PCC 15990 - PGEN Compliance	251	250	-	-	-	-	-	-	
455	KG	5054509	PG CAP/PI Consulting Costs	8	-	-	-	-	-	-	-	
456	KG	5057916	PCC 14211 - Hydro Water Mgmt. Allocation	-	2,095	2,523	2,384	1,475	1,497	1,533	1,771	
457	KG	5059029	Drum Water Management	318	75	14	-	-	-	-	-	
458	KG	5059030	ML Water Mgmt	397	200	11	-	-	-	-	-	
459	KG	5059272	PCC 14225 - MaintPlng Alloc to Operate	-	228	-	-	-	-	-	-	
460	KG	5060451	PCC 15992 - PG Training	-	265	726	201	435	442	452	1,838	
461	KG	5061489	SCV - 13548 - Helms Lodging - MWC KG	-	45	(86)	(133)	(494)	-	-	-	
462	KG	5061490	SCV - 12679 - Balch Lodging - MWC KG	-	28	(74)	(130)	(31)	-	-	-	
463	KG	5062950	Shasta O&M - Fleet Rentals	-	-	185	123	237	241	246	253	
464	KG	5062951	DeSabla O&M - Fleet Rentals	-	-	238	202	357	362	371	381	

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465	KG	5062952	KCV O&M - Fleet Rentals	-	-	200	50	119	121	124	128	
466	KG	5062953	Helms O&M - Fleet Rentals	-	-	111	73	101	103	105	108	
467	KG	5062954	Drum O&M - Fleet Rentals	-	-	248	197	295	300	307	315	
468	KG	5062955	Motherlode O&M - Fleet Rentals	-	-	434	394	532	541	553	569	
469	KG	5234638	PG Learning Contract Costs	142	216	263	2	117	35	36	37	
470	KG	5236336	Records Management Initiative - exp	1,215	610	190	430	754	250	256	539	
471	KG	5236339	Hydro Waterwy Public Safety Exp	-	-	3	105	116	117	119	209	
472	KG	5236344	Kings River Ground Grid repair	-	-	-	-	0	-	-	-	
473	KG	5236349	NERC Compliance Matrix Dvlpmt & Prc Imp	88	3	1	2	1	1	1	1	
474	KG	5243452	PG Driving Safety Initiatives	2	-	-	-	-	150	154	157	
475	KG	5245332	Pit 3 PH Ground Grid Modifications	111	1	-	-	-	-	-	-	
476	KG	5248552	Drum- Rock Creek Res Siphon	-	-	-	0	-	-	-	-	
477	KG	5251693	Drum - NID Condemnation Support	1	-	-	3	0	-	-	-	
478	KG	5253320	Coleman Ground Grid Mitigation	4	-	-	-	-	-	-	-	
479	KG	5255038	NERC Relay Settings Evaluation	0	-	-	1	0	-	-	-	
480	KG	5258826	Relay and Battery Test	397	181	139	46	76	77	79	81	
481	KG	5260075	Spring Gap Ground Grid Mitigation	16	-	-	-	-	-	-	-	
482	KG	5263273	NERC Regulations & Guidance	100	147	156	90	50	100	102	198	
483	KG	5266134	Integrated Seismic Risk Mgmt Prog- Hydro	136	139	97	213	321	-	-	-	
484	KG	5267072	Pit 5 PH Mitigate Ground Grid	41	-	-	-	-	-	-	-	
485	KG	5267073	Pit 4 PH Ground Grid Mitigation	69	1	-	-	-	-	-	-	
486	KG	5267544	Guidance Documents	869	607	474	723	604	470	481	494	
487	KG	5268482	Public Safety Plan Exp	14	-	-	-	-	109	111	114	
488	KG	5269333	HC Dropped Objects Mitigation Program	2,977	1,064	-	-	-	-	-	-	
489	KG	5269338	PG CMM - Gap Closer Plan	2,161	2,148	(7)	-	-	-	-	-	
490	KG	5270032	Pub Sfty - Public Outreach RAMP	-	253	234	188	1	300	307	314	
491	KG	5270033	Pub Sfty- Emergency Action Plans RAMP	1,015	807	739	569	653	800	819	838	
492	KG	5271425	Alta PH Bypass Water Alternatives	-	12	-	-	-	-	-	-	
493	KG	5271512	Spaulding 2 Replace 3X3 Section of Apron	-	76	5	-	-	-	-	-	
494	KG	5271513	Spaulding 2 TSV and DC Motor Testing	-	-	3	29	-	-	-	-	
495	KG	5271514	Butt Valley Ground Grid Mitigation	-	11	49	4	-	-	-	-	

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496	KG	5273675	Hydro Falling ROCK EOC	-	30	1	-	-	-	-	-	
497	KG	5273935	CAISOTelemetry Points Phase 2	-	235	475	28	24	-	-	-	
498	KG	5279280	Belden PH Modify Manual Sync Check Rela	-	-	-	5	0	-	-	-	
499	KG	5279913	Insight Maintenance Planners	-	-	-	965	80	-	-	-	
500	KG	5280713	Shasta Region PH Grating Loads Rating	-	-	-	-	-	-	-	50	
501	KG	5281081	PGen Academy Training Support	-	-	-	389	643	700	716	838	
502	KG	5284285	PG 2023 GRC Request - Defensible Space	-	-	-	373	381	400	410	-	WP 3-429
503	KG	5286989	CCC In-House Course	-	-	-	-	-	200	205	218	
504	KG	5287096	IMT Training	-	-	-	-	-	200	205	210	
505	KG	5286413	Records Management Initiative	-	-	-	-	92	300	-	-	
506	**KG**	**KG Total**		**44,462**	**43,123**	**38,864**	**39,546**	**40,707**	**42,522**	**43,214**	**56,053**	Sum of Lines 390-505
507	**KG**											
508	KH	5287186	Civil Infrastructure Maintenance Program	-	-	-	-	-	-	-	4,000	WP 3-199
509	KH	5287177	Turbine Runner Maintenance/Welding	-	-	-	-	-	-	-	1,500	WP 3-420
510	KH	5000562	Helms Maint Generators	4,648	2,491	4,440	3,039	2,939	2,984	3,054	4,520	
511	KH	5000558	DeSabla Maint Generators	1,514	1,770	1,458	1,946	2,608	2,632	2,694	4,137	
512	KH	5000559	Drum Maint Generators	710	548	755	944	739	750	768	1,962	
513	KH	5000561	KCV Maint Generators	1,815	2,275	1,623	2,829	3,828	3,927	4,019	5,108	
514	KH	5287188	I&C (Instru and Controls) Asset Family	-	-	-	-	-	-	-	1,000	
515	KH	5000557	Shasta Maint Generators	2,189	3,338	2,519	3,853	3,682	3,513	3,596	4,908	
516	KH	5222375	Helms - Outage Expense Work	-	-	-	-	-	800	-	850	WP 3-242
517	KH	5000560	ML Maint Generators	1,090	1,200	1,179	1,853	1,752	1,779	1,821	2,685	
518	KH	5287187	Critical Instr calibration & OP settings	-	-	-	-	-	-	-	800	
519	KH	5000452	ML Maint TCom/Comput/Network	764	625	561	704	625	635	650	995	
520	KH	5000449	Shasta Maint TCom/Comput/Network	489	562	532	401	764	776	794	1,143	
521	KH	5043763	SCV - 15065 -DESIGN DRAFT DRAW - MWC	167	275	101	(36)	(258)	-	-	-	
522	KH	5285294	Pit 6 PH Draft Tubes Welding Repairs	-	-	-	-	-	-	-	250	
523	KH	5260284	Helms 10-Yr Sump Cleaning	-	-	-	-	-	-	-	200	
524	KH	5271377	Hamilton Branch Ground Grid Mitigation	-	-	-	-	-	-	-	200	
525	KH	5285772	Helms Test 230kV Cable Oil Filled	-	-	-	-	-	150	200	200	

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Line No.	MWC	Planning Order	Description	2020 Recorded Adjusted	2021 Recorded Adjusted	2022 Recorded Adjusted	2023 Recorded Adjusted	2024 Recorded Adjusted	2025 Forecast	2026 Forecast	2027 Forecast	WP Reference
526	KH	5022294	AM: Bearing Program	523	300	143	18	32	33	34	216	
527	KH	5000618	Shasta Maint Other Plant	865	852	193	282	350	535	547	562	
528	KH	5000451	Drum Maint TCom/Comput/Network	564	775	551	858	537	545	558	737	
529	KH	5056570	SCV - 14170 -Test, Com, & Start - MWC KH	-	(1,489)	305	(53)	(133)	-	-	-	
530	KH	5067249	Shasta Maintain Switchyard Equipment	7	122	63	58	117	165	168	173	
531	KH	5282995	Stanislaus Runner Repair	-	-	-	284	(23)	-	-	-	
532	KH	5000619	DeSabla Maint Other Plant	722	585	1,013	850	734	761	779	800	
533	KH	5056571	SCV - 11556 Inspect & CntrSfty - MWC KH	-	(2,356)	(144)	(17)	(15)	-	-	-	
534	KH	5000450	DeSabla Maint TCom/Comput/Network	164	194	390	387	500	507	519	534	
535	KH	5053629	Motherlode- Fire Protection ITM Contract	7	10	9	4	13	13	13	14	
536	KH	5022297	AM: Turbine Program	297	246	167	164	337	342	350	360	
537	KH	5265134	Helms SPOF Study	8	7	5	6	3	3	3	3	
538	KH	5009056	Potter Valley Maintain Other Equip	52	30	55	86	131	133	136	140	
539	KH	5020616	AM: Governor Program	388	362	393	343	342	348	356	366	
540	KH	5020619	AM: High Voltage Transformer Program	140	63	41	107	30	30	31	32	
541	KH	5020621	AM: Generator Assessment Program	71	63	17	46	61	62	63	65	
542	KH	5001568	ML LOE	134	289	42	3	-	-	-	-	
543	KH	5010551	Drum LOE	121	145	41	2	-	-	-	-	
544	KH	5015389	DeSabla Engineering LOE	190	194	141	95	-	-	-	-	
545	KH	5015390	Shasta Engineering LOE	119	175	37	10	-	-	-	-	
546	KH	5027192	Drum - Fire Protection ITM Contract	14	4	5	1	-	-	-	-	
547	KH	5059273	PCC 14225 - MaintPlng Alloc to Maintain	-	271	-	-	-	-	-	-	
548	KH	5063209	PGEN Risk Management	-	-	119	1	-	-	-	-	
549	KH	5232333	Belden Repair Lower Draft Tube	1	-	-	-	-	-	-	-	
550	KH	5235599	Helms - U1 Stator Restoration/Investig	-	-	3	-	-	-	-	-	
551	KH	5241355	PE: Electrical One Lines and P&IDs	0	-	-	-	-	-	-	-	
552	KH	5245774	Spaulding 2 Runner Repair and Rebalance	1	0	-	-	-	-	-	-	
553	KH	5260383	Kerckhoff 2 - Runner Welding	-	153	-	388	-	-	-	-	
554	KH	5260415	Pit 6 Draft Tube Structural Retrofit	116	(1)	-	-	-	-	-	-	
555	KH	5262015	Poe PH Repair U1 Generator	166	-	-	-	-	-	-	-	
556	KH	5263392	Helms Cycling Study	4	1	-	-	-	-	-	-	

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557	KH	5263393	Helms Rotor Field Warranty Inspection	21	-	-	-	-	-	-	-	
558	KH	5263405	DeSabla - BTH Rigging Equipment	2	82	-	-	-	-	-	-	
559	KH	5265765	DeSabla Area WSIP Equipment Repairs	38	8	(247)	-	-	-	-	-	
560	KH	5266213	AM: Engineering Effort	(3)	-	-	-	-	-	-	-	
561	KH	5266252	SCADA Documentation/File Review/Creati	44	-	-	-	-	-	-	-	
562	KH	5266792	Helms - U2 Draft Tube Repair/Slab Leak	140	(3)	-	-	-	-	-	-	
563	KH	5267052	Helms - Rplc CB270/CB280 Interrupters	10	-	-	-	-	-	-	-	
564	KH	5267613	Belden PH Rebuild WG Upthrust Assembly	85	(111)	-	-	-	-	-	-	
565	KH	5268352	SCADA Lab Equipment	-	0	-	-	-	-	-	-	
566	KH	5269345	Helms U1 Draft Tube Door Seal Repair	422	140	-	-	-	-	-	-	
567	KH	5269492	Newcastle Replace Main Bank HO Bushing	49	-	-	-	-	-	-	-	
568	KH	5270914	AM: Employee Charge In	55	26	-	-	-	-	-	-	
569	KH	5271317	Helms U1 - Runner Welding	-	(0)	326	-	-	-	-	-	
570	KH	5271319	Helms U3 - Runner Welding	-	(0)	484	-	-	-	-	-	
571	KH	5271376	Rock Creek PH Redesign Auto Sync 52G	-	7	1	5	-	-	-		
572	KH	5271457	Haas Deferred Maint Crane Repairs	43	427	1	-	-	-	-	-	
573	KH	5271459	Helms # U1 Replace Main Tub Oil	-	39	319	-	-	-	-	-	
574	KH	5271460	Helms # U3 Replace Main Tub Oil	-	33	237	(0)	-	-	-	-	
575	KH	5272953	Stan Cooling Coil Thrust Repair	-	851	-	-	-	-	-	-	
576	KH	5273452	Helms - Uprate Study	-	124	1	-	-	-	-	-	
577	KH	5274692	Hat Creek 2 PH Repair Runner	-	-	-	235	-	-	-	-	
578	KH	5276872	Pit 3 PH Repair GSU Transformer	-	-	347	-	-	-	-	-	
579	KH	5277377	Helms – Courtright I/D Gate Oil Release	-	-	10	-	-	-	-	-	
580	KH	5278983	JBB U2 Repair Main Bank Transformer	-	-	8	79	-	-	-	-	
581	KH	5280557	Helms House 8539 Abatement	-	-	16	9	-	-	-	-	
582	KH	5282812	Salt Springs 2 Runner Repairs	-	-	-	414	-	-	-	-	
583	KH	5283012	Business Planning Software	-	-	-	1	-	-	-	-	
584	KH	5036009	Hydro Ops Sr Dir - Contract & Consulting	-	-	69	76	107	108	111	114	
585	KH	5027191	Kings Crane-Fire Protection ITM Contr	39	40	36	64	51	51	53	54	
586	KH	5000621	ML Maint Other Plant	1,137	870	480	1,252	1,164	1,182	1,209	1,243	
587	KH	5036013	PG O&M South Dir - ATS Support	11	9	21	23	0	-	-	-	

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588	KH	5000623	Helms Maint Other Plant	308	547	481	545	612	621	636	653	
589	KH	5015231	SCADA-Operatnl Issues,Stndrds & Plng	473	280	239	251	496	504	516	530	
590	KH	5037618	Cost Model Adjustment-KH	-	-	-	-	0	-	-	-	
591	KH	5282672	Helms U1 Pnstk Field Weld Coating	-	-	-	-	0	-	-	-	
592	KH	5000454	Helms Maint TCom/Computer/Network Sy	185	80	117	169	153	155	159	163	
593	KH	5000620	Drum Maint Other Plant	52	370	(43)	349	333	338	346	355	
594	KH	5009053	Potter Valley Maint Turbine & Governors	277	453	162	95	31	32	33	33	
595	KH	5000622	KCV Maint Other Plant	615	613	619	540	397	403	413	424	
596	KH	5283112	Helms Eval Cooling Water Pipe Corrosion	-	-	-	-	1	-	-	-	
597	KH	5261092	Helms - U1 Alignment/Bearing Adjustment	-	-	-	-	1	-	-	-	
598	KH	5260131	Pit 3 U2 TSV Motor Replace/Refurbish	-	-	-	-	1	-	-	-	
599	KH	5271461	Haas U1 Runner Welding	-	-	-	-	-	50	51	-	
600	KH	5271653	Haas U2 Runner Welding	-	-	-	-	-	50	51	-	
601	KH	5279276	Rock Creek Repair Ground Grid	-	-	-	2	4	-	-	-	
602	KH	5279217	Dutch Flat PSV Trunnion Pck Follower Bsh	-	-	-	20	4	-	-	-	
603	KH	5287076	Portable & Standby Generator	-	-	-	-	6	-	-	-	
604	KH	5062251	SCV - 11579 - GC RESOURCE PLN - MWC K	-	-	43	27	6	-	-	-	
605	KH	5004592	KCV Engineering Support	75	98	55	39	7	-	-	-	
606	KH	5001567	Helms Engineering Support	79	108	117	2	11	-	-	-	
607	KH	5000453	KCV Maint TCom/Computer/Network Sys	134	78	100	241	116	102	105	107	
608	KH	5260374	Balch 2 U3 Runner Welding	-	-	-	-	18	-	-	-	
609	KH	5260373	Balch 2 U2 Runner Welding	-	-	-	-	23	-	-	-	
610	KH	5279278	Butt Valley - Thrust Brg Heat Xchng Eval	-	-	-	5	27	-	-	-	
611	KH	5279277	Belden PH - Thrust Brg Heat Xchng Eval	-	-	-	5	33	-	-	-	
612	KH	5271318	Helms U2 - Runner Welding	-	-	-	-	41	-	-	-	
613	KH	5045396	SCV - 14411 - Proj Engineering - MWC KH	112	158	139	(17)	124	-	-	-	
614	KH	5001645	PG Design, Drafting & Drawing Mgmt. LOE	630	18	19	124	126	-	-	-	
615	KH	5284339	Helms U2 DTG Fairing Plate Weld Repairs	-	-	-	2	139	-	-	-	
616	KH	5285466	Belden PH Repair Draft Tube Cavitation	-	-	-	-	176	-	-	-	
617	KH	5273575	Miocene Canal Engineering - SHF ATL	-	1,360	498	424	197	-	-	-	
618	KH	5286612	Helms U3 Runner Welding	-	-	-	-	328	-	-	-	

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619	**KH**	**KH Total**		**23,094**	**20,781**	**21,408**	**24,439**	**24,427**	**25,019**	**24,835**	**42,136**	Sum of Lines 508-618
620	**KH**											
621	KI	5000541	Shasta Maint Infrastructure	1,074	855	936	1,579	1,334	988	1,011	1,233	
622	KI	5000542	DeSabla Maint Infrastructure	337	702	592	894	581	590	604	717	
623	KI	5000543	Drum Maint Infrastructure	158	181	53	52	222	226	231	431	
624	KI	5000544	ML Maint Infrastructure	386	692	250	738	334	340	348	551	
625	KI	5000545	KCV Maint Infrastructure	185	402	479	287	440	445	455	662	
626	KI	5000546	Helms Maint Infrastructure	45	24	24	38	24	24	25	219	
627	KI	5000658	Shasta Maint Generation Fac Structure	200	186	46	161	238	371	380	390	
628	KI	5000659	DeSabla Maint Generation Fac Structure	620	557	762	903	1,062	1,078	1,103	1,134	
629	KI	5000660	Drum Maint Generation Fac Structure	625	521	602	663	735	746	764	785	
630	KI	5000661	ML Maint Generation Fac Structure	770	865	658	730	868	881	902	927	
631	KI	5000662	KCV Maint Generation Fac Structure	814	919	1,252	1,312	1,389	1,410	1,444	1,484	
632	KI	5000663	Helms Maint Generation Fac Structure	533	534	627	745	852	865	885	910	
633	KI	5009052	Potter Valley Maint Structures	19	13	12	5	43	65	67	68	
634	KI	5009058	Potter Valley Maint Infrastructure	77	93	19	26	23	2	2	2	
635	KI	5009210	Helms Snow Removal	1,290	1,299	1,659	2,080	2,566	2,606	2,667	2,741	
636	KI	5015290	Camp One Maint Infrastructure	188	67	390	767	83	84	86	186	
637	KI	5015291	Camp One Operate Generation Facilities	137	339	667	621	571	580	593	610	
638	KI	5015293	Manton Maint Infrastructure	143	313	79	126	-	106	109	112	
639	KI	5015294	Manton Maint Gen Structures	11	2	0	44	8	139	142	146	
640	KI	5015791	AM: Hydro Bridge Program	246	279	261	293	286	291	298	306	
641	KI	5025891	AM: Roads Program	-	496	465	289	225	228	234	240	
642	KI	5056565	AM: Substation Inspection Program	-	-	-	-	-	-	-	1,500	
643	KI	5215721	Caribou Camp - Repair Camp Buildings	2	10	-	-	-	-	-	-	
644	KI	5223752	Spaulding Tram Timber Repairs Annual	75	40	32	49	2	-	-	50	
645	KI	5238789	Rock Creek VH - Concrete Ceiling Repairs	25	-	-	-	-	-	-	-	
646	KI	5241972	Helms - Support Fac Leachfield Study	-	1	0	-	-	-	-	-	
647	KI	5243872	Pit 3 Tailrace Bridge Expense Upgrade	346	28	-	-	-	-	-	-	
648	KI	5253514	CV - Lakeshore Park Lot Sale Reimburse	-	-	(26)	-	-	-	-	-	
649	KI	5253812	Pit 1 PH Repair Gutters & Down Spouts	-	10	-	-	-	-	-	-	

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650	KI	5259936	Drum 1 & 2 - Ground Grid Mitigation	(0)	-	-	-	-	-	-	-	
651	KI	5260436	Bear River Suspension Bridge M20 Repairs	10	-	-	-	-	-	-	-	
652	KI	5265763	DeSabla Area WSIP Infrastructure Repairs	10	1	(34)	-	-	-	-	-	
653	KI	5267114	DeSabla Area NERC Security Repairs	244	-	-	-	-	-	-	-	
654	KI	5267521	Phoenix Ground Grid Mitigation	32	95	31	-	-	-	-	-	
655	KI	5267617	Belden Adit 1 Bridge Repair Footing	-	-	-	12	1	-	-	-	
656	KI	5269358	Pit 6 PH Repair Roof Joint Seals	-	-	-	-	-	-	-	100	
657	KI	5269754	Pillsbury Pines Erosion Repairs	133	197	-	-	-	-	-	-	
658	KI	5271172	Dutch Flat Roof Installl Snow Guards	32	410	-	-	-	-	-	-	
659	KI	5271320	Helms - Paint Employee Housing	249	-	-	-	-	-	-	200	
660	KI	5271339	West Point Valve House Pave Access Road	65	-	-	-	-	-	-	-	
661	KI	5271418	Drum Canal Tahoe Spill Clean Road Cross	-	33	-	-	-	-	-	-	
662	KI	5271422	Alta PH Drainage Improvements	-	33	-	-	-	-	-	-	
663	KI	5271437	Shasta Road Maintenance	-	-	-	-	-	-	-	300	
664	KI	5272009	Pit 3 Rock Creek Bridge Repair Footing	-	31	1	-	-	-	-	-	
665	KI	5273512	PG 2021 Enhanced Inventory Trans Dist	-	122	-	-	-	-	-	-	
666	KI	5273815	Drum 1 PH Sump Pit Rpr	-	43	-	-	-	-	-	-	
667	KI	5273972	Pit 3 Tailrace Bridge Repair Pier Voids	-	1	-	-	-	-	-	-	
668	KI	5275613	Rock Creek VH Repairs	-	-	-	538	-	-	-	-	
669	KI	5276435	ML Waste Water System Insp/Repair	-	7	24	272	9	-	-	-	
670	KI	5276555	Pit 5 VH Hillside Install Liner	-	-	2	-	-	-	-	-	
671	KI	5277234	Fordyce LLO Valve House Strc Repair	-	-	1	-	-	-	-	-	
672	KI	5277692	Pit 3 PH Repair Upper Roof	-	-	-	137	-	-	-	-	
673	KI	5278353	Helms Turbine Deck Pressure Relief Weir	-	-	-	0	8	-	-	-	
674	KI	5279293	Drum Septic Systems Compliance Inspecti	-	-	-	124	(21)	-	-	-	
675	KI	5280933	Drum PH Road Safety Improvements	-	-	-	-	81	-	-	-	
676	KI	5280934	Camp 9 Road Safety Improvements	-	-	-	103	60	-	-	-	
677	KI	5282693	Helms U1,2&3 Repr TSV Cracked Bolt Caps	-	-	-	-	5	-	-	-	
678	KI	5283132	Balch PH Road Rockfall Hazard	-	-	-	-	1	-	-	-	
679	KI	5283352	Helms Septic Compliance Insp	-	-	-	-	27	-	-	-	
680	KI	5283353	KCV Septic Compliance Ins	-	-	-	-	32	-	-	-	

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Line No.	MWC	Planning Order	Description	2020 Recorded Adjusted	2021 Recorded Adjusted	2022 Recorded Adjusted	2023 Recorded Adjusted	2024 Recorded Adjusted	2025 Forecast	2026 Forecast	2027 Forecast	WP Reference
681	KI	5283923	DeSabla Septic Compliance Insp	-	-	-	-	157	-	-	-	
682	KI	5284052	Shasta Septic Compliance Insp	-	-	-	-	34	-	-	-	
683	KI	5286092	Helms 40th Anniversary	-	-	-	-	127	-	-	-	
684	KI	5287180	Veg. Management PH defensible Space	-	-	-	-	-	-	-	2,250	WP 3-429
685	KI	5283434	Butt Valley Repair Penstock Drainage	-	-	-	-	10	-	-	-	
686	KI	5286175	Bridge Repair Risk Reduction	-	-	-	-	-	300	-	-	
687	**KI**	**KI Total**		**9,080**	**10,399**	**9,864**	**13,587**	**12,418**	**12,364**	**12,347**	**18,254**	Sum of Lines 621-686
688	**KI**											
689	KJ	5000406	ML Comply with Hydro Licenses	221	587	658	449	1,446	799	817	840	
690	KJ	5010031	ML Required Facility Safety Prog	947	1,104	1,965	709	1,412	1,125	1,668	5,112	WP 3-463
691	KJ	5042369	Des Cent LC - FERC 803 - L&EM	23	27	24	63	187	20	20	21	
692	KJ	5010035	DeSabla Reqrd Facility Safety Prog	1,200	980	1,057	1,488	3,022	2,900	1,718	1,224	WP 3-463
693	KJ	5043749	SCV - 11583 - Hydro Licensing -MWC KJ	61	94	(41)	20	139	-	-	-	
694	KJ	5012433	Crane Vly LC Cultural O&M - NSO	82	65	52	24	32	-	-	-	
695	KJ	5250361	HC Powerhouse Flow Reporting- Testing	58	109	41	25	41	25	26	26	
696	KJ	5013149	Stan SGap LC TLS/ES Proj. Exp	6	14	5	3	10	-	-	-	
697	KJ	5043762	SCV - 15060 - Facilities Safety - MWC KJ	11	454	30	(12)	0	-	-	-	
698	KJ	5000407	KCV Comply with Hydro Licenses	1,287	222	268	297	317	321	329	338	
699	KJ	5012817	Pit 345 LC Rec Fac Maint - NSO	287	450	200	278	162	164	168	173	
700	KJ	5012409	Stan SGap LC ProjExp - FERC 2130 - L&EM	169	432	209	202	183	185	190	195	
701	KJ	5000408	Helms Comply with Hydro Licenses	17	22	143	86	92	94	96	98	
702	KJ	5000540	Helms Maint Fish/Wildlife Facilities	47	33	36	41	13	13	13	14	
703	KJ	5012430	Battle Cr NSO Salmon AMP Mitigate & Mon	81	107	93	137	118	120	123	126	
704	KJ	5003229	DeSabla Comply with Hydro Licenses	734	679	794	922	765	777	795	817	
705	KJ	5001765	HL: Manage Hydro Regulatory Program	607	624	633	776	718	729	746	767	
706	KJ	5000538	ML Maint Fish/Wildlife Facilities	21	27	-	-	16	16	16	17	
707	KJ	5054252	DSP: Radial Gates Investigation	1,329	509	1,627	1,536	511	518	531	545	WP 3-463
708	KJ	5012619	Potter Valley USGS Fees	35	6	21	21	22	22	22	23	
709	KJ	5013154	Shasta USGS Fees	123	122	122	124	125	127	130	134	
710	KJ	5012617	ML USGS Fees	81	81	84	88	89	90	92	95	
711	KJ	5054251	DSP: Surveillance Data Acqstn/Eval	478	475	619	394	401	408	417	429	WP 3-463

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Line No.	MWC	Planning Order	Description	2020 Recorded Adjusted	2021 Recorded Adjusted	2022 Recorded Adjusted	2023 Recorded Adjusted	2024 Recorded Adjusted	2025 Forecast	2026 Forecast	2027 Forecast	WP Reference
712	KJ	5000537	Drum Maint Fish/Wildlife Facilities	0	-	-	-	-	-	-	-	
713	KJ	5000675	Helms Manage Recreational Facilities	12	1	-	3	-	-	-	-	
714	KJ	5016109	Kern License Conditions	57	(3)	-	-	-	-	-	23	
715	KJ	5045749	Chili Bar LC - FERC 2155 (POST BA)	69	53	(0)	-	-	-	-	-	
716	KJ	5047954	HL: ADA Compliance Recreation Facilities	105	1	32	-	-	-	-	-	
717	KJ	5216964	Pit 345 Road Management Plan (Expense)	14	-	-	-	-	-	-	-	
718	KJ	5227054	Balch Camp - Cultural Resource Plan	0	-	-	-	-	-	-	-	
719	KJ	5245335	Pit 3 Britton Dam Concrete Bridge Repair	49	137	-	-	-	-	-	-	
720	KJ	5246179	Drum -FERC Patching Annual	266	185	0	-	-	-	-	-	
721	KJ	5258012	Spillway Assessments SAIP	3	-	-	-	-	-	-	-	
722	KJ	5287453	FERC Security Improvements FSI - Exp	-	-	-	-	-	-	-	1,220	WP 3-452
723	KJ	5062949	Hydro Compliance - Fleet Rentals	-	-	9	-	48	48	49	51	
724	KJ	5012815	Pit 345 LC Reveg Maint and Monitor	18	13	8	9	20	21	21	22	
725	KJ	5013158	DeSabla USGS Fees	81	81	77	85	86	87	89	91	
726	KJ	5012621	KCV USGS Fees	80	80	75	71	57	58	59	61	
727	KJ	5012429	Battle Cr NSO Salmon Mitigate & Monitor	-	-	-	5	40	41	42	43	
728	KJ	5012598	Shasta FERC 2106 Fish Planting and Tag	236	311	298	291	295	299	306	315	
729	KJ	5027339	Shasta Crayfish Fund	23	302	117	218	180	183	187	192	
730	KJ	5012618	Drum USGS Fees	121	106	107	110	111	112	115	118	
731	KJ	5011049	Pit 1 LC - FERC 2687 - L&EM	302	408	295	328	317	322	329	338	
732	KJ	5009849	Moke LC - FERC 137 - L&EM	890	1,304	465	343	356	362	370	381	
733	KJ	5000405	Drum Comply with Hydro Licenses	124	226	307	289	167	170	174	179	
734	KJ	5009050	Potter Valley Comply w/ Hydro License	58	57	37	120	76	77	79	81	
735	KJ	5015789	Haas-Kings LC Fisheries Monitoring	17	22	245	51	8	8	9	9	
736	KJ	5000403	Shasta Comply with Hydro Licenses	480	510	442	607	373	379	388	398	
737	KJ	5010033	Potter Valley Req Facility Sfty Pgm	552	309	1,028	1,083	1,009	1,024	1,048	1,078	WP 3-463
738	KJ	5001137	DeSabla Manage Recreation Facilities	909	914	1,104	1,730	1,696	1,721	1,762	1,811	
739	KJ	5015232	Bucks Cr LA 103 - FERC 619 - L&EM	63	76	62	55	75	77	78	81	
740	KJ	5012813	Pit 345 LC - FERC 233 - L&EM	746	637	1,043	669	497	505	517	531	
741	KJ	5011551	RCC-FERC 1962 License Compliance	670	684	606	728	854	867	887	912	
742	KJ	5000674	Southern Area Hydro Mnge Rec Facilities	458	426	573	593	598	607	621	639	

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Line No.	MWC	Planning Order	Description	2020 Recorded Adjusted	2021 Recorded Adjusted	2022 Recorded Adjusted	2023 Recorded Adjusted	2024 Recorded Adjusted	2025 Forecast	2026 Forecast	2027 Forecast	WP Reference
743	KJ	5011566	Hat Creek LC - FERC 2661 - L&EM	86	129	93	135	153	155	159	163	
744	KJ	5012549	Potter Valley LC - FERC 77 - L&EM	773	715	719	846	1,106	1,123	1,149	1,182	
745	KJ	5009057	Potter Valley Maintain Recreation Fac.	613	502	669	591	636	645	660	679	
746	KJ	5047951	Spring Gap-Stan PE&C Recreation Exp	307	317	51	588	327	332	340	349	
747	KJ	5012814	Pit 345 LC Operation Related	90	174	175	251	197	200	204	210	
748	KJ	5000673	ML Manage Recreational Facilities	598	569	692	547	766	778	796	819	
749	KJ	5000672	Drum Manage Recreational Facilities	539	540	561	583	672	682	698	718	
750	KJ	5000670	Shasta Manage Recreational Facilities	712	567	621	1,003	770	782	800	823	
751	KJ	5263197	Poe Dam Paint Bypass Gates	1	9	0	30	(0)	-	-	-	
752	KJ	5271423	Upper Blue Dam Sensitive Species Monitor	-	29	77	60	36	61	-	-	
753	KJ	5276877	Mokelumne PM&E Fund	-	-	73	89	388	480	491	550	
754	KJ	5286174	LLO & Radial Gate Inspections	-	-	-	-	974	1,100	-		WP 3-515
755	KJ	5001043	Required Facility Safety Program	1,054	1,403	668	668	505	725	575	2,722	WP 3-463
756	KJ	5010032	Drum Required Facility Safety Prog	1,098	1,154	562	2,050	1,049	1,325	1,458	4,601	WP 3-463
757	KJ	5012434	Crane Vly LC Ecol - FERC 1354 - L&EM	241	301	451	253	188	594	406	798	
758	KJ	5010030	KCV Required Facility Safety Prog	594	413	500	490	490	1,150	1,087	1,090	WP 3-463
759	KJ	5010029	Helms Required Facility Safety Prog	207	401	92	145	361	1,050	1,044	1,045	WP 3-463
760	KJ	5010034	Shasta Reqrd Facility Safety Prog	891	1,719	654	1,035	811	2,400	4,000	5,296	WP 3-463
761	**KJ**	**KJ Total**		**22,115**	**23,006**	**22,229**	**24,420**	**26,110**	**29,003**	**28,919**	**40,613**	Sum of Lines 689-760
762	**KJ**											
763	OM	5033719	Oper Mgmt Hydro PCC 12691	489	490	564	275	306	305	317	329	
764	OM	5033720	Oper Mgmt Hydro PCC 12692	658	290	267	299	405	1,051	1,090	1,131	
765	OM	5033721	Oper Mgmt Hydro PCC 13733	276	333	343	386	408	426	442	459	
766	OM	5033724	Oper Mgmt Hydro PCC 15042	581	602	364	440	538	1,046	1,086	1,126	
767	OM	5034342	Oper Mgmt PGEN Hydro Cap OH Cr	(952)	(689)	(1,416)	(1,392)	(2,033)	(3,165)	(3,283)	(3,407)	
768	OM	5041334	Oper Mgmt Hydro PCC 15814	104	-	-	-	-	-	-	-	
769	OM	5044310	Oper Mgmt Hydro PCC 11566	244	204	96	372	1,014	812	842	874	
770	OM	5047674	Oper Mgmt Hydro PCC 12676	220	259	476	361	367	373	387	401	
771	OM	5052295	Oper Mgmt PGEN PCC 15992	1,174	496	-	-	-	-	-	-	
772	OM	5056530	Oper Mgmt Hydro PCC 18036	-	237	262	271	278	289	299	311	
773	OM	5057912	Oper Mgmt Hydro PCC 15813	-	318	359	409	473	479	496	515	

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774	OM	5057914	Oper Mgmt Hydro PCC 14212	-	410	500	406	-	(0)	(0)	(0)	
775	OM	5059271	Oper Mgmt Hydro PCC 15814	-	140	546	496	630	565	586	608	
776	OM	5072409	Oper Support EP&S PCC 14263 – Hydro	-	-	-	-	-		-	-	
777	**OM**	**OM Total**		**2,794**	**3,090**	**2,360**	**2,323**	**2,386**	**2,180**	**2,262**	**2,347**	Sum of Lines 763-776
778	**OM**											
779	OS	5033921	Oper Suppt Hydro PCC 14005	3,010	2,160	4,924	5,550	6,552	6,605	6,852	7,109	
780	OS	5033922	Oper Suppt Hydro PCC 14703	1,711	2,535	1,550	1,830	3,644	3,903	4,049	4,201	
781	OS	5033923	Oper Suppt Hydro PCC 14705	2,516	2,197	8,514	9,412	11,398	16,245	16,855	17,487	
782	OS	5034372	Oper Suppt PGEN Hydro Cap OH Cr	(4,816)	(5,392)	(11,006)	(10,838)	(15,822)	(21,770)	(22,586)	(23,433)	
783	OS	5043945	Oper Suppt Hydro PCC 15056	416	507	228	586	1,928	1,940	2,013	2,088	
784	OS	5061491	Oper Suppt Hydro PCC 14225	-	(417)	1,434	1,665	2,606	2,495	2,588	2,685	
785	OS	5061492	Oper Suppt Hydro PCC 15990	-	86	1,989	1,782	3,599	1,023	1,061	1,101	
786	OS	5062281	Oper Suppt Hydro PCC 15064	-	-	397	330	336	420	436	452	
787	**OS**	**OS Total**		**2,836**	**1,675**	**8,030**	**10,318**	**14,241**	**10,861**	**11,268**	**11,690**	Sum of Lines 779-786
788	**OS**											
789		**Grand Total**		**160,906**	**164,163**	**165,497**	**179,830**	**199,057**	**190,223**	**182,717**	**284,740**	Sum of Lines 39,50,223,226,235,244,388,506,619,687,761,777 and 787

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Line No.	Year	Program/Activity	Amount		Detailed Description/Assumptions	Reference From
1	**2024**	**Adjusted Recorded**	**5,080**			WP 3-1, Line 1
2		Escalation	78		Includes labor and non-labor escalation	Line 1 x WP 3-44, Line 4
3		Adjustment	-910		Land Conservation Support	WP 3-3, Line 34
4		Adjustment	376		Training Crafting Proficiency	WP 3-4, Line 36
5		Adjustment	-806		PG Planning & Budget Process/LTP Support	WP 3-4, Line 37
6		Misc Adjustment	-890		Other adjustments	Remaining Adjustments
7		**Total Net Change**	**-2,154**			Sum of Lines 2-6
8						
9	**2025**	**Forecast**	**2,926**			Line 1 + Line 7 and WP 3-1, Line 1
10		Escalation	69		Includes labor and non-labor escalation	Line 9 x WP 3-44, Line 4
11		Adjustment	18		Training Crafting Proficiency	WP 3-4, Line 36
12		Misc Adjustment	-425		Other adjustments	Remaining Adjustments
13		**Total Net Change**	**-338**			Sum of Lines 10-12
14						
15	**2026**	**Forecast**	**2,588**			Line 9 + Line 13 and WP 3-1, Line 1
16		Escalation	72		Includes labor and non-labor escalation	Line 15 x WP 3-44, Line 4
17		Adjustment	334		Lands Conservation Support	WP 3-3, Line 34
18		Adjustment	1,282		Training Crafting Proficiency	WP 3-4, Line 36
19		Misc Adjustment	77		Other adjustments	Remaining Adjustments
20		**Total Net Change**	**1,766**			Sum of Lines 16-19
21						
22	**2027**	**Forecast**	**4,354**			Line 15 + Line 20 and WP 3-1, Line 1

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Line No.	Year	Program/Activity	Amount		Detailed Description/Assumptions	Reference From
1	**2024**	**Adjusted Recorded**	**981**			WP 3-1, Line 2
2		Escalation	15		Includes labor and non-labor escalation	Line 1 x WP 3-44, Line 4
3		Misc Adjustment	-2		Net adjustment for yearly cost fluctuations in managing the environmental operations of various watersheds	Remaining Adjustments
4		**Total Net Change**	**13**			Sum of Lines 2-3
5						
6	**2025**	**Forecast**	**994**			Line 1 + Line 4 and WP 3-1, Line 2
7		Escalation	23		Includes labor and non-labor escalation	Line 6 x WP 3-44, Line 4
8		**Total Net Change**	**23**			Line 7
9						
10	**2026**	**Forecast**	**1,017**			Line 6 + Line 8 and WP 3-1, Line 2
11		Escalation	28		Includes labor and non-labor escalation	Line 10 x WP 3-44, Line 4
12		Misc Adjustment	-1		Net adjustment for yearly cost fluctuations in managing the environmental operations of various watersheds	Remaining Adjustments
13		**Total Net Change**	**28**			Sum of Lines 11-12
14						
15	**2027**	**Forecast**	**1,045**			Line 10 + Line 13 and WP 3-1, Line 2

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Line No.	Year	Program/Activity	Amount		Detailed Description/Assumptions	Reference From
1	**2024**	**Adjusted Recorded**	**35,932**			WP 3-1, Line 3
2		Escalation	550		Includes labor and non-labor escalation	Line 1 x WP 3-44, Line 4
3		Adjustment	1,000		Emergent expense work	WP 3-4, Line 53
4		Adjustment	1,539		Manton Main Reservoirs/Dams/Waterways	WP 3-9, Line 214
5		Adjustment	-434		Asset Management Program Enhancement	WP 3-4 to 3-5, Lines 56, 58-61, 65, 66, 71, 72, 81-83
6		Adjustment	-3,266		Systemwide Canal Blitz	WP 3-8, Line 190
7		Adjustment	-3,063		Butte Canal Resoration and PG Level of Effort	WP 3-8 to 3-9, Lines 194, 198, 200, 221
8		Adjustment	100		Dam Safety	WP 3-4 to 3-5, Lines 55, 57, 62, 64, 67, 86
9		Misc Adjustment	-1,249		Net adjustment for yearly cost fluctuations in managing the dams and waterways of various watersheds	Remaining Adjustments
10		**Total Net Change**	**-4,823**			Sum of Lines 2-9
11						
12	**2025**	**Forecast**	**31,109**			Line 1 + Line 10 and WP 3-1, Line 3
13		Escalation	731		Includes labor and non-labor escalation	Line 12 x WP 3-44, Line 4
14		Adjustment	-1,126		Penstock Inspection Program	WP 3-9, Line 208
15		Adjustment	0		Asset Management Program Enhancement	WP 3-4 to 3-5, Lines 56, 58-61, 65, 66, 71, 72, 81-83
16		Adjustment	-3,071		Systemwide Canal Blitz	WP 3-8, Line 190
17		Adjustment	-358		Soil Moisture	WP 3-9, Line 210
18		Adjustment	-716		PGen Road Program Insp	WP 3-9, Line 211
19		Adjustment	200		Butte Canal Resoration and PG Level of Effort	WP 3-8 to 3-9, Lines 194, 198, 200, 221
20		Misc Adjustment	-987		Net adjustment for yearly cost fluctuations in managing the dams and waterways of various watersheds	Remaining Adjustments
21		**Total Net Change**	**-5,327**			Sum of Lines 13-20
22						

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Line No.	Year	Program/Activity	Amount		Detailed Description/Assumptions	Reference From
23	**2026**	**Forecast**	**25,782**			Line 12 + Line 21 and WP 3-1, Line 3
24		Escalation	719		Includes labor and non-labor escalation	Line 23 x WP 3-44, Line 4
25		Adjustment	7,600		Asset Management Program Enhancement	WP 3-4 to 3-5, Lines 56, 58-61, 65, 66, 71, 72, 81-83
26		Adjustment	2,902		Base Water Delivery & Storage Maintenance Improvements	WP 3-4 to 3-5, Lines 63, 68, 69, 75-77, 84
27		Adjustment	1,972		Emergent expense work	WP 3-4, Line 53
28		Adjustment	3,231		Spillway Vegetation Management	WP 3-4, Line 52
29		Adjustment	681		Vegetation Management Regulatory	WP 3-5, Lines 74, 78
30		Adjustment	4,566		Dam Safety	WP 3-4 to 3-5, Lines 55, 57, 62, 64, 67, 86
31		Adjustment	-6		Butte Canal Resoration and PG Level of Effort	WP 3-8 to 3-9, Lines 194, 198, 200, 221
32		Adjustment	1,800		Dredging Program	WP 3-4, Line 54
33		Adjustment	421		Potter Valley Penstock Debris Removal	WP 3-5, Line 70
34		Misc Adjustment	1,334		Net adjustment for yearly cost fluctuations in managing the dams and waterways of various watersheds	Remaining Adjustments
35		**Total Net Change**	**25,221**			Sum of Lines 24-34
36						
37	**2027**	**Forecast**	**51,002**			Line 23 + Line 35 and WP 3-1, Line 3

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Line No.	Year	Program/Activity	Amount		Detailed Description/Assumptions	Reference From
1	**2024**	**Adjusted Recorded**	**175**			WP 3-1, Line 4
2		Escalation	3		Includes labor and non-labor escalation	Line 1 x WP 3-44, Line 4
3		**Total Net Change**	**3**			Line 2
4						
5	**2025**	**Forecast**	**178**			Line 1 + Line 3 and WP 3-1, Line 4
6		Escalation	4		Includes labor and non-labor escalation	Line 5 x WP 3-44, Line 4
7		**Total Net Change**	**4**			Line 6
8						
9	**2026**	**Forecast**	**182**			Line 5 + Line 7 and WP 3-1, Line 4
10		Escalation	5		Includes labor and non-labor escalation	Line 9 x WP 3-44, Line 4
11		**Total Net Change**	**5**			Line 10
12						
13	**2027**	**Forecast**	**187**			Line 9 + Line 11 and WP 3-1, Line 4

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Line No.	Year	Program/Activity	Amount		Detailed Description/Assumptions	Reference From
1	**2024**	**Adjusted Recorded**	**-175**			WP 3-1, Line 5
2		Misc Adjustment	175		Net adjustment for yearly cost fluctuations in reimbursable work of various watersheds	Remaining Adjustments
3		**Total Net Change**	**175**			Line 2
4						
5	**2025**	**Forecast**	**0**			Line 1 + Line 3 and WP 3-1, Line 5
6		**Total Net Change**	**0**			NA
7						
8	**2026**	**Forecast**	**0**			Line 5 + Line 6 and WP 3-1, Line 5
9		**Total Net Change**	**0**			NA
10						
11	**2027**	**Forecast**	**0**			Line 8 + Line 9 and WP 3-1, Line 5

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Line No.	Year	Program/Activity	Amount		Detailed Description/Assumptions	Reference From
1	**2024**	**Adjusted Recorded**	**1,926**			WP 3-1, Line 6
2		Escalation	29		Includes labor and non-labor escalation	Line 1 x WP 3-44, Line 4
3		**Total Net Change**	**29**			Line 2
4						
5	**2025**	**Forecast**	**1,956**			Line 1 + Line 3 and WP 3-1, Line 6
6		Escalation	46		Includes labor and non-labor escalation	Line 5 x WP 3-44, Line 4
7		**Total Net Change**	**46**			Line 6
8						
9	**2026**	**Forecast**	**2,002**			Line 5 + Line 7 and WP 3-1, Line 6
10		Escalation	56		Includes labor and non-labor escalation	Line 9 x WP 3-44, Line 4
11		**Total Net Change**	**56**			Line 10
12						
13	**2027**	**Forecast**	**2,058**			Line 9 + Line 11 and WP 3-1, Line 6

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Line No.	Year	Program/Activity	Amount		Detailed Description/Assumptions	Reference From
1	**2024**	**Adjusted Recorded**	**34,850**			WP 3-1, Line 7
2		Escalation	533		Includes labor and non-labor escalation	Line 1 x WP 3-44, Line 4
3		Adjustment	-410		FERC License Conditions	WP 3-10 to 13, Lines 247-252, 267-280, 309-316, 318, 320-325, 330, 341, 346, 351
4		Adjustment	442		Inundation Maps	WP 3-11, Line 301
5		Adjustment	-998		FERC License Surrender	WP 3-12 to 13, Lines 326,327,353
6		Adjustment	-327		Spillway Facility Safety Program	WP 3-11 to 13, Lines 283-300, 302-307, 317,339,340,342,348,349
7		Adjustment	-1,080		Power Gen Tree Mortality	WP 3-12, Line 308
8		Adjustment	-97		Defensible Space (WMPMA/FRMMA)	WP 3-13 to 14, Lines 363,366,371, 377-380
9		Adjustment	58		Enhanced Switchyard Inspection (WMPMA/FRMMA)	WP 3-13 to 14, Lines 360,362,369,370, 372-376, 384-387
10		Adjustment	718		FERC Security Improvements	WP 3-12, Lines 328,331-335
11		Adjustment	-3		Vegetation Management Regulatory (FRMMA)	WP 3-13, Lines 359 and 367
12		Adjustment	-2,564		Dam Safety Program	WP 3-12 to 13, Lines 336,337,338,343,344,345,352,
13		Misc Adjustment	-12		Net adjustment for yearly cost fluctuations in spillway repair work and license condition work of various watersheds	Remaining Adjustments
14		**Total Net Change**	**-3,739**			Sum of Lines 2-13
15						
16	**2025**	**Forecast**	**31,111**			Line 1 + Line 14 and WP 3-1, Line 7
17		Escalation	731		Includes labor and non-labor escalation	Line 16 x WP 3-44, Line 4
18		Adjustment	-750		FERC License Conditions	WP 3-10 to 13, Lines 247-252, 267-280, 309-316, 318, 320-325, 330, 341, 346, 351
19		Adjustment	-12		Inundation Maps	WP 3-11, Line 301
20		Adjustment	146		FERC License Surrender	WP 3-12 to 13, Lines 326,327,353
21		Adjustment	-794		Spillway Facility Safety Program	WP 3-11 to 13, Lines 283-300, 302-307, 317,339,340,342,348,349
22		Adjustment	-433		Power Gen Tree Mortality	WP 3-12, Line 308
23		Adjustment	-102		Defensible Space (WMPMA/FRMMA)	WP 3-13 to 14, Lines 363,366,371, 377-380
24		Adjustment	-562		Enhanced Switchyard Inspection (WMPMA/FRMMA)	WP 3-13 to 14, Lines 360,362,369,370, 372-376, 384-387
25		Adjustment	-1,227		FERC Fees	WP 3-10, Line 260-266
26		Adjustment	-689		FERC Security Improvements	WP 3-12, Lines 328,331-335
27		Adjustment	18		Vegetation Management Regulatory (FRMMA)	WP 3-13, Lines 359 and 367
28		Adjustment	943		Dam Safety Program	WP 3-12 to 13, Lines 336,337,338,343,344,345,352,

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Line No.	Year	Program/Activity	Amount		Detailed Description/Assumptions	Reference From
29		Misc Adjustment	-80		Net adjustment for yearly cost fluctuations in spillway repair work and license condition work of various watersheds	Remaining Adjustments
30		**Total Net Change**	**-2,810**			Sum of Lines 17-29
31						
32	**2026**	**Forecast**	**28,301**			Line 16 + Line 30 and WP 3-1, Line 7
33		Escalation	790		Includes labor and non-labor escalation	Line 32 x WP 3-44, Line 4
34		Adjustment	10,689		FERC License Conditions	WP 3-10 to 13, Lines 247-252, 267-280, 309-316, 318, 320-325, 330, 341, 346, 351
35		Adjustment	-139		Spillway Facility Safety Program	WP 3-11 to 13, Lines 283-300, 302-307, 317,339,340,342,348,349
36		Adjustment	1,972		Power Gen Tree Mortality	WP 3-12, Line 308
37		Adjustment	1,444		FERC License Surrender	WP 3-12 to 13, Lines 326,327,353
38		Adjustment	16,971		Kilarc Cow Decommissioning	WP 3-12, Line 329
39		Adjustment	-1,053		Defensible Space (WMPMA/FRMMA)	WP 3-13 to 14, Lines 363,366,371, 377-380
40		Adjustment	-2,262		Enhanced Switchyard Inspection (WMPMA/FRMMA)	WP 3-13 to 14, Lines 360,362,369,370, 372-376, 384-387
41		Adjustment	-866		FERC Fees	WP 3-10, Line 260-266
42		Adjustment	-1,028		FERC Security Improvements	WP 3-12, Lines 328,331-335
43		Adjustment	-540		Vegetation Management Regulatory (FRMMA)	WP 3-13, Lines 359 and 367
44		Adjustment	-1,758		Dam Safety Program	WP 3-12 to 13, Lines 336,337,338,343,344,345,352,
45		Misc Adjustment	2,479		Net adjustment for yearly cost fluctuations in spillway repair work and license condition work of various watersheds	Remaining Adjustments
46		**Total Net Change**	**26,700**			Sum of Lines 33-45
47						
48	**2027**	**Forecast**	**55,000**			Line 32 + Line 46 and WP 3-1, Line 7

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Line No.	Year	Program/Activity	Amount		Detailed Description/Assumptions	Reference From
1	**2024**	**Adjusted Recorded**	**40,707**			WP 3-1, Line 8
2		Escalation	623		Includes labor and non-labor escalation	Line 1 x WP 3-44, Line 4
3		Adjustment	501		Helms Lodging	WP 3-16, Line 461
4		Adjustment	-478		Hydro Operators	WP 3-14 to 16, Lines 391-396, 456
5		Adjustment	854		Qualified Workforce Training, Safety and Compliance Program Needs	WP 3-16 to 17, Lines 460,471,474,482,487,490,501,504
6		Adjustment	352		FERC Security Plan	WP 3-16, Line 438
7		Misc Adjustment	691		Net adjustment for yearly cost fluctuations in various asset management programs, the operation of various generation facilities, and facility safety programs	Remaining Adjustments
8		**Total Net Change**	**2,544**			Sum of Lines 2-7
9						
10	**2025**	**Forecast**	**42,522**			Line 1 + Line 8 and WP 3-1, Line 8
11		Escalation	999		Includes labor and non-labor escalation	Line 10 x WP 3-44, Line 4
12		Misc Adjustment	-308		Net adjustment for yearly cost fluctuations in various asset management programs, the operation of various generation facilities, and facility safety programs	Remaining Adjustments
13		**Total Net Change**	**692**			Sum of Lines 11-12
14						
15	**2026**	**Forecast**	**43,214**			Line 10 + Line 13 and WP 3-1, Line 8
16		Escalation	1,206		Includes labor and non-labor escalation	Line 15 x WP 3-44, Line 4
17		Adjustment	8,325		Hydro Operators	WP 3-14 to 16, Lines 391-396, 456
18		Adjustment	1,651		Qualified Workforce Training, Safety and Compliance Program Needs	WP 3-16 to 17, Lines 460,471,474,482,487,490,501,504
19		Adjustment	1,405		FERC Security Plan	WP 3-16, Line 438
20		Misc Adjustment	252		Net adjustment for yearly cost fluctuations in various asset management programs, the operation of various generation facilities, and facility safety programs	Remaining Adjustments
21		**Total Net Change**	**12,839**			Sum of Lines 16-20
22						
23	**2027**	**Forecast**	**56,053**			Line 15 + Line 21 and WP 3-1, Line 8

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Line No.	Year	Program/Activity	Amount		Detailed Description/Assumptions	Reference From
1	**2024**	**Adjusted Recorded**	**24,427**			WP 3-1, Line 9
2		Escalation	374		Includes labor and non-labor escalation	Line 1 x WP 3-44, Line 4
3		Adjustment	800		Helms Outage Work	WP 3-18, Line 516
4		Adjustment	-201		Base Maintenance Improvements	WP 3-18, Lines 510,511,512, 513,515,517,519,520,528
5		Misc Adjustment	-380		Net adjustment for yearly cost fluctuations in various asset management programs, and the maintaining of various generation facilities	Remaining Adjustments
6		**Total Net Change**	**592**			Sum of Lines 2-5
7						
8	**2025**	**Forecast**	**25,019**			Line 1 + Line 6 and WP 3-1, Line 9
9		Escalation	588		Includes labor and non-labor escalation	Line 8 x WP 3-44, Line 4
10		Adjustment	-819		Helms Outage Work	WP 3-18, Line 516
11		Misc Adjustment	46		Net adjustment for yearly cost fluctuations in various asset management programs, and the maintaining of various generation facilities	Remaining Adjustments
12		**Total Net Change**	**-184**			Sum of Lines 9-11
13						
14	**2026**	**Forecast**	**24,835**			Line 8 + Line 12 and WP 3-1, Line 9
15		Escalation	693		Includes labor and non-labor escalation	Line 14 x WP 3-44, Line 4
16		Adjustment	7,538		Base Maintenance Improvements	WP 3-18, Lines 510,511,512, 513,515,517,519,520,528
17		Adjustment	1,500		Turbine Runner Maintenance/Welding	WP 3-18, Line 509
18		Adjustment	4,000		Civil Infrastructure Maintenance Program	WP 3-18, Line 508
19		Adjustment	1,800		Instruments & Controls Calibration and Maintenance	WP 3-18, Lines 514, 518
20		Adjustment	850		Helms Outage Work	WP 3-18, Line 516
21		Misc Adjustment	920		Net adjustment for yearly cost fluctuations in various asset management programs, and the maintaining of various generation facilities	Remaining Adjustments
22		**Total Net Change**	**17,301**			Sum of Lines 15-21
23						
24	**2027**	**Forecast**	**42,136**			Line 14 + Line 22 and WP 3-1, Line 9

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Line No.	Year	Program/Activity	Amount		Detailed Description/Assumptions	Reference From
1	**2024**	**Adjusted Recorded**	**12,418**			WP 3-1, Line 10
2		Escalation	190		Includes labor and non-labor escalation	Line 1 x WP 3-44, Line 4
3		Misc Adjustment	-244		Net adjustment for yearly cost fluctuations in bridge assessment and repair, and the maintaining of generation facility infrastructure	Remaining Adjustments
4		**Total Net Change**	**-54**			Sum of Lines 2-3
5						
6	**2025**	**Forecast**	**12,364**			Line 1 + Line 4 and WP 3-1, Line 10
7		Escalation	291		Includes labor and non-labor escalation	Line 6 x WP 3-44, Line 4
8		Misc Adjustment	-307		Net adjustment for yearly cost fluctuations in bridge assessment and repair, and the maintaining of generation facility infrastructure	Remaining Adjustments
9		**Total Net Change**	**-16**			Sum of Lines 7-8
10						
11	**2026**	**Forecast**	**12,347**			Line 6 + Line 9 and WP 3-1, Line 10
12		Escalation	344		Includes labor and non-labor escalation	Line 11 x WP 3-44, Line 4
13		Adjustment	1,500		Enhanced Switchyard Inspection	WP 3-22, Line 642
14		Adjustment	1,092		Base Infrastructure Maintenance Improvements	WP 3-21, Lines 621-626, 636
15		Adjustment	2,250		Defensible Space Management	WP 3-24, Line 684
16		Misc Adjustment	720		Net adjustment for yearly cost fluctuations in bridge assessment and repair, and the maintaining of generation facility infrastructure	Remaining Adjustments
17		**Total Net Change**	**5,907**			Sum of Lines 12-16
18						
19	**2027**	**Forecast**	**18,254**			Line 11 + Line 17 and WP 3-1, Line 10

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Line No.	Year	Program/Activity	Amount		Detailed Description/Assumptions	Reference From
1	**2024**	**Adjusted Recorded**	**26,110**			WP 3-1, Line 11
2		Escalation	399		Includes labor and non-labor escalation	Line 1 x WP 3-44, Line 4
3		Adjustment	2,908		Facility Safety Program	WP 3-24 to 27, Lines 690,692,755, 756,758,759,760
4		Misc Adjustment	-415		Net adjustment for yearly cost fluctuations in regulatory compliance activities such as maintaining fish and wildlife facilities, maintaining recreational facilities and facility safety programs	Remaining Adjustments
5		**Total Net Change**	**2,893**			Sum of Lines 2-4
6						
7	**2025**	**Forecast**	**29,003**			Line 1 + Line 5 and WP 3-1, Line 11
8		Escalation	682		Includes labor and non-labor escalation	Line 7 x WP 3-44, Line 4
9		Adjustment	624		Facility Safety Program	WP 3-24 to 27, Lines 690,692,755, 756,758,759,760
10		Adjustment	-1,126		LLO & Radial Gate Inspections	WP 3-27, Line 754
11		Misc Adjustment	-264		Net adjustment for yearly cost fluctuations in regulatory compliance activities such as FERC/DSOD/USGS fees, maintaining fish and wildlife facilities, maintaining recreational facilities and facility safety programs	Remaining Adjustments
12		**Total Net Change**	**-84**			Sum of Lines 8-11
13						
14	**2026**	**Forecast**	**28,919**			Line 7 + Line 12 and WP 3-1, Line 11
15		Escalation	807		Includes labor and non-labor escalation	Line 14 x WP 3-44, Line 4
16		Adjustment	9,218		Facility Safety Program	WP 3-24 to 27, Lines 690,692,755, 756,758,759,760
17		Adjustment	1,220		FERC Security Improvements	WP 3-25, Line 722
18		Misc Adjustment	450		Net adjustment for yearly cost fluctuations in regulatory compliance activities such as USGS fees, maintaining fish and wildlife facilities, maintaining recreational facilities and facility safety programs	Remaining Adjustments
19		**Total Net Change**	**11,695**			Sum of Lines 15-18
20						
21	**2027**	**Forecast**	**40,613**			Line 14 + Line 19 and WP 3-1, Line 11

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Line No.	Year	Program/Activity	Amount		Detailed Description/Assumptions	Reference From
1	**2024**	**Adjusted Recorded**	**2,386**			WP 3-1, Line 12
2		Escalation	36		Includes labor and non-labor escalation	Line 1 x WP 3-44, Line 4
3		Misc Adjustment	-242		Net adjustment for yearly cost fluctuations in operation management	Remaining Adjustments
4		**Total Net Change**	**-205**			Sum of Lines 2-3
5						
6	**2025**	**Forecast**	**2,180**			Line 1 + Line 4 and WP 3-1, Line 12
7		Escalation	51		Includes labor and non-labor escalation	Line 6 x WP 3-44, Line 4
8		Misc Adjustment	31		Net adjustment for yearly cost fluctuations in operation management	Remaining Adjustments
9		**Total Net Change**	**82**			Sum of Lines 7-8
10						
11	**2026**	**Forecast**	**2,262**			Line 6 + Line 9 and WP 3-1, Line 12
12		Escalation	63		Includes labor and non-labor escalation	Line 11 x WP 3-44, Line 4
13		Misc Adjustment	22		Net adjustment for yearly cost fluctuations in operation management	Remaining Adjustments
14		**Total Net Change**	**85**			Sum of Lines 12-13
15						
16	**2027**	**Forecast**	**2,347**			Line 11 + Line 14 and WP 3-1, Line 12

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Expense Walk by Major Work Category OS
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Line No.	Year	Program/Activity	Amount		Detailed Description/Assumptions	Reference From
1	**2024**	**Adjusted Recorded**	**14,241**			WP 3-1, Line 13
2		Escalation	218		Includes labor and non-labor escalation	Line 1 x WP 3-44, Line 4
3		Adjustment	-3,665		Additional Operations Support offset by capital credits	WP 3-28, Lines 781, 782, 785
4		Misc Adjustment	66		Other Operations Support Adjustments	Remaining Adjustments
5		**Total Net Change**	**-3,381**			Sum of Lines 2-4
6						
7	**2025**	**Forecast**	**10,861**			Line 1 + Line 5 and WP 3-1, Line 13
8		Escalation	255		Includes labor and non-labor escalation	Line 7 x WP 3-44, Line 4
9		Adjustment	-63		Additional Operations Support offset by capital credits	WP 3-28, Lines 781, 782, 785
10		Misc Adjustment	215		Other Operations Support Adjustments	Remaining Adjustments
11		**Total Net Change**	**407**			Sum of Lines 8-10
12						
13	**2026**	**Forecast**	**11,268**			Line 7 + Line 11 and WP 3-1, Line 13
14		Escalation	314		Includes labor and non-labor escalation	Line 13 x WP 3-44, Line 4
15		Misc Adjustment	108		Other Operations Support Adjustments	Remaining Adjustments
16		**Total Net Change**	**423**			Sum of Lines 14-15
17						
18	**2027**	**Forecast**	**11,690**			Line 13 + Line 16 and WP 3-1, Line 13

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Escalation Rates and Factors

Line No.		Blended Escalation Rate							Blended Escalation Factors						
1		2024	2025	2026	2027	2028	2029	2030	2024	2025	2026	2027	2028	2029	2030
2															
3	Exhibit (Energy Supply - Fossil Gen)	2.24%	1.01%	1.84%	2.29%	2.35%	2.44%	2.49%	1.000	1.010	1.029	1.052	1.077	1.103	1.131
4	Exhibit (Energy Supply - Hydro Gen)	2.29%	1.53%	2.35%	2.79%	2.76%	2.77%	2.90%	1.000	1.015	1.039	1.068	1.098	1.128	1.161
5	Exhibit (Energy Supply - Energy Procurement)	3.46%	3.15%	3.07%	3.30%	3.33%	3.33%	3.34%	1.000	1.032	1.063	1.098	1.135	1.173	1.212
6															
7															
8	Source: Exhibit 10, Chapter 15 Workpapers.														

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Line No.	Year	Program/Activity	Amount		Detailed Description/Assumptions	Reference From
1	**2024**	**Adjusted Recorded**	**199,057**			WP 3-1, Line 14
2		Escalation	12,640		Includes labor and non-labor escalation for 2025, 2026 & 2027	Escalation from WP 3-29 to WP 4-43 for years 2025, 2026 & 2027
3		Adjustment	33,584		Operate and Maintain Generation (MWC KG, KH and KI)	WP 3-1, Lines 8-10 - Year 2027 less Year 2024 less Escalation for 2025, 2026, 2027
4		Adjustment	13,070		Maintain Water Delivery and Storage (MWC AX)	WP 3-1, Line 3- Year 2027 less Year 2024 less Escalation for 2025, 2026, 2027
5		Adjustment	12,613		Compliance (MWC AK, AY, EP and KJ)	WP 3-1, Lines 2, 4, 6, 11- Year 2027 less Year 2024 less Escalation for 2025, 2026, 2027
6		Adjustment	18,097		Hydro Licensing Balancing Account (MWC IG)	WP 3-1, Line 7 - Year 2027 less Year 2024 less Escalation for 2025, 2026, 2027
7		Adjustment	-4,321		Other (MWC AB, BC, OM and OS)	WP 3-1, Lines 1, 12, 13 - Year 2027 less Year 2024 less Escalation for 2025, 2026, 2027
8	**2027**	**Forecast**	**284,740**			WP 3-1, Line 14

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Risk Register Mapping - Expense
(Thousands of Nominal Dollars)

Line No.	Planning Order	Planning Order Description	Mitigation or Control Name	MWC	2027 Forecast ($000)	Shared Project
1	**Large Uncontrolled Water Release (Dam Failure)**					
2	5000528	Shasta Maint Reservoirs/Dams/Waterways	C001 - Maintenance	AX	1,693	
3	5000529	DeSabla Maint Reservoirs/Dams/Waterways	C001 - Maintenance	AX	1,401	
4	5000530	Drum Maint Reservoirs/Dams/Waterways	C001 - Maintenance	AX	3,262	
5	5000531	ML Maint Reservoirs/Dams/Waterways	C001 - Maintenance	AX	4,205	
6	5000532	KCV Maint Reservoirs/Dams/Waterways	C001 - Maintenance	AX	2,111	
7	5000533	Helms Maint Reservoirs/Dams/Waterways	C001 - Maintenance	AX	344	
8	5001043	Required Facility Safety Program	F001 - Dam Safety Program	KJ	2,722	
9	5004009	Non Req Facility Safety Program	F001 - Dam Safety Program	AX	200	
10	5009055	Potter Valley Maintain Dams & Reservoirs	C001 - Maintenance	AX	511	
11	5010029	Helms Required Facility Safety Prog	F001 - Dam Safety Program	KJ	1,045	
12	5010030	KCV Required Facility Safety Prog	F001 - Dam Safety Program	KJ	1,090	
13	5010031	ML Required Facility Safety Prog	F001 - Dam Safety Program	KJ	5,112	
14	5010032	Drum Required Facility Safety Prog	F001 - Dam Safety Program	KJ	4,601	
15	5010033	Potter Valley Req Facility Sfty Pgm	F001 - Dam Safety Program	KJ	1,078	
16	5010034	Shasta Reqrd Facility Safety Prog	F001 - Dam Safety Program	KJ	5,296	
17	5010035	DeSabla Reqrd Facility Safety Prog	F001 - Dam Safety Program	KJ	1,224	
18	5014629	Drum Vegetation Management	C001 - Maintenance	AX	1,499	90%
19	5014630	ML Vegetation Management	C001 - Maintenance	AX	1,040	90%
20	5018935	KCV Vegetation Management	C001 - Maintenance	AX	637	90%
21	5020449	DeSabla NFFR Vegetation Mgmt	C001 - Maintenance	AX	652	
22	5021709	IRIS Licensing/Monitoring Fees/Support	F001 - Dam Safety Program	AX	491	
23	5021849	Helms Vegetation Management	C001 - Maintenance	AX	209	90%
24	5047178	FERC Security Plan	F002 - Physical Security Program	KG	1,620	90%
25	5054251	DSP: Surveillance Data Acqstn/Eval	F001 - Dam Safety Program	KJ	429	
26	5054252	DSP: Radial Gates Investigation	F001 - Dam Safety Program	KJ	545	

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Risk Register Mapping - Expense
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Line No.	Planning Order	Planning Order Description	Mitigation or Control Name	MWC	2027 Forecast ($000)	Shared Project
27	5260129	Pit 6 Spilwy Aprn/Tailrce Remove Block 1	M002 - Spillway Remediation	AX	156	
28	5280074	PG Spillway Vegetation Management	C001 - Maintenance	AX	3,231	
29	5284352	PG Dam Rodent Abatement	C001 - Maintenance	AX	1,571	
30	5286985	DSP: Specialized Inspections: Concr	F001 - Dam Safety Program	AX	300	
31	5286997	AM: Dam Asset Risk Analysis	F001 - Dam Safety Program	AX	400	
32	5287170	AM: Insp & Surv Program - Dam Face US&DS	F001 - Dam Safety Program	AX	950	
33	5287172	AM: L1RA portfolio risk	F001 - Dam Safety Program	AX	500	
34	5287183	Dredging Program (Maintenance)	C001 - Maintenance	AX	1,800	
35	5287454	Dams Concrete Drain Cleaning and Inspect	C001 - Maintenance	AX	800	
36	5287455	Dams Concrete Maintenance/Repairs	C001 - Maintenance	AX	1,000	
37	5272077	Inundation Maps	F001 - Dam Safety Program	IG	3,000	
38	5287008	Drum Forebay Repr Spillway Joints SAIP	C001 - Maintenance	IG	272	
39						
40			**Total**		**56,998**	
41						
42	**Extended Unplanned Shutdown of a Critical Power Generation Asset**					
43	5000449	Shasta Maint TCom/Comput/Network	C5 - Maintaining the Systems	KH	1,143	
44	5000450	DeSabla Maint TCom/Comput/Network	C5 - Maintaining the Systems	KH	534	
45	5000451	Drum Maint TCom/Comput/Network	C5 - Maintaining the Systems	KH	737	
46	5000452	ML Maint TCom/Comput/Network	C5 - Maintaining the Systems	KH	995	
47	5000453	KCV Maint TCom/Computer/Network Sys	C5 - Maintaining the Systems	KH	107	
48	5000454	Helms Maint TCom/Computer/Network Sys	C5 - Maintaining the Systems	KH	163	
49	5000493	Shasta Manage Environmental Opns	C6 - Operating the Facility Within Requirements	AK	174	
50	5000494	DeSabla Manage Environmental Opns	C5 - Maintaining the Systems	AK	297	
51	5000495	Drum Manage Environmental Ops	C5 - Maintaining the Systems	AK	113	
52	5000496	ML Manage Environmental Ops	C6 - Operating the Facility Within Requirements	AK	99	

Pacific Gas and Electric Company
2027 General Rate Case
Exhibit (PG&E-5), Chapter 3
Hydro Operations
Risk Register Mapping - Expense
(Thousands of Nominal Dollars)

Line No.	Planning Order	Planning Order Description	Mitigation or Control Name	MWC	2027 Forecast ($000)	Shared Project
53	5000497	KCV Manage Environmental Opns	C6 - Operating the Facility Within Requirements	AK	206	
54	5000498	Helms Manage Environmental	C6 - Operating the Facility Within Requirements	AK	120	
55	5000557	Shasta Maint Generators	C5 - Maintaining the Systems	KH	4,908	
56	5000558	DeSabla Maint Generators	C5 - Maintaining the Systems	KH	4,137	
57	5000559	Drum Maint Generators	C5 - Maintaining the Systems	KH	1,962	
58	5000560	ML Maint Generators	C5 - Maintaining the Systems	KH	2,685	
59	5000561	KCV Maint Generators	C5 - Maintaining the Systems	KH	5,108	
60	5000562	Helms Maint Generators	C5 - Maintaining the Systems	KH	4,520	
61	5000659	DeSabla Maint Generation Fac Structure	C5 - Maintaining the Systems	KI	1,134	
62	5001777	Manage Technical Services	C2 - Ancillary Support to Operate & Maintain Plants	KG	983	
63	5009210	Helms Snow Removal	C2 - Ancillary Support to Operate & Maintain Plants	KI	2,741	
64	5013162	KCV FOC Switching Center Support	C2 - Ancillary Support to Operate & Maintain Plants	KG	1,378	
65	5014629	Drum Vegetation Management	C4 - Controls related to External Events	AX	166.5	10%
66	5014630	ML Vegetation Management	C4 - Controls related to External Events	AX	115.6	10%
67	5015231	SCADA-Operatnl Issues,Stndrds & Plng	C1 - Administrative Controls	KH	530	
68	5015791	AM: Hydro Bridge Program	M1 - Component Replacement or Repair Civil	KI	306	
69	5018935	KCV Vegetation Management	C4 - Controls related to External Events	AX	71	10%
70	5020613	AM: Arc Flash Hazard Assessment Program	M2 - Component Replacement or Repair Electrical	KG	208	
71	5020615	AM: Water Conveyance Assessments Prgm	M1 - Component Replacement or Repair Civil	AX	692	
72	5020616	AM: Governor Program	M3 - Component Replacement or Repair Mechanical	KH	366	
73	5020617	AM: Penstock Program	M1 - Component Replacement or Repair Civil	AX	2,514	
74	5020619	AM: High Voltage Transformer Program	M2 - Component Replacement or Repair Electrical	KH	32	
75	5020621	AM: Generator Assessment Program	M2 - Component Replacement or Repair Electrical	KH	65	
76	5020624	AM: Pressure Boundaries Program	M1 - Component Replacement or Repair Civil	AX	275	
77	5021849	Helms Vegetation Management	C4 - Controls related to External Events	AX	23	10%
78	5022294	AM: Bearing Program	M3 - Component Replacement or Repair Mechanical	KH	216	

Pacific Gas and Electric Company
2027 General Rate Case
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Hydro Operations
Risk Register Mapping - Expense
(Thousands of Nominal Dollars)

Line No.	Planning Order	Planning Order Description	Mitigation or Control Name	MWC	2027 Forecast ($000)	Shared Project
79	5022297	AM: Turbine Program	M3 - Component Replacement or Repair Mechanical	KH	360	
80	5024830	AM: HV Breaker Program	M2 - Component Replacement or Repair Electrical	KG	27	
81	5024831	AM: Exciter Program	M2 - Component Replacement or Repair Electrical	KG	100	
82	5025891	AM: Roads Program	M1 - Component Replacement or Repair Civil	KI	240	
83	5047178	FERC Security Plan	M4 - External Event Mitigation	KG	180	10%
84	5053105	PCC 18010 - PGEN Quality Verification	C6 - Operating the Facility Within Requirements	KG	963	
85	5056565	AM: Substation Inspection Program	M2 - Component Replacement or Repair Electrical	KI	1,500	
86	5057916	PCC 14211 - Hydro Water Mgmt. Allocation	C6 - Operating the Facility Within Requirements	KG	1,771	
87	5060451	PCC 15992 - PG Training	C6 - Operating the Facility Within Requirements	KG	1,838	
88	5062331	Upper Drum Water Conveyance Patching	C5 - Maintaining the Systems	AX	650	
89	5062950	Shasta O&M - Fleet Rentals	C6 - Operating the Facility Within Requirements	KG	253	
90	5062951	DeSabla O&M - Fleet Rentals	C6 - Operating the Facility Within Requirements	KG	381	
91	5062952	KCV O&M - Fleet Rentals	C6 - Operating the Facility Within Requirements	KG	128	
92	5062953	Helms O&M - Fleet Rentals	C6 - Operating the Facility Within Requirements	KG	108	
93	5062954	Drum O&M - Fleet Rentals	C6 - Operating the Facility Within Requirements	KG	315	
94	5062955	Motherlode O&M - Fleet Rentals	C6 - Operating the Facility Within Requirements	KG	569	
95	5063118	Mokelumne Water Conveyance Patching	C5 - Maintaining the Systems	AX	651	
96	5222375	Helms - Outage Expense Work	M3 - Component Replacement or Repair Mechanical	KH	850	
97	5236336	Records Management Initiative - exp	C1 - Administrative Controls	KG	539	
98	5247934	HC: Weather/Seismic/Wildfire Emergent Wo	M4 - External Event Mitigation	AX	3,000	
99	5258826	Relay and Battery Test	M1 - Component Replacement or Repair Civil	KG	81	
100	5263273	NERC Regulations & Guidance	C6 - Operating the Facility Within Requirements	KG	198	
101	5267544	Guidance Documents	C1 - Administrative Controls	KG	494	
102	5269273	ISO 55000 Certification	C1 - Administrative Controls	AB	168	
103	5269358	Pit 6 PH Repair Roof Joint Seals	M1 - Component Replacement or Repair Civil	KI	100	
104	5284269	Asset Excellence Program Manager	All Mitigations	AX	400	

Pacific Gas and Electric Company
2027 General Rate Case
Exhibit (PG&E-5), Chapter 3
Hydro Operations
Risk Register Mapping - Expense
(Thousands of Nominal Dollars)

Line No.	Planning Order	Planning Order Description	Mitigation or Control Name	MWC	2027 Forecast ($000)	Shared Project
105	5285294	Pit 6 PH Draft Tubes Welding Repairs	M3 - Component Replacement or Repair Mechanical	KH	250	
106	5285772	Helms Test 230kV Cable Oil Filled	M2 - Component Replacement or Repair Electrical	KH	200	
107	5286984	AM:PH Civil AF Prog Dvlp Cond Assmt	M1 - Component Replacement or Repair Civil	AX	500	
108	5286986	Hydro Veg Prgrm Development - GIS	M4 - External Event Mitigation	AX	1,100	
109	5286996	AM: 811 Program	M1 - Component Replacement or Repair Civil	AX	250	
110	5287000	AM: PI Asset Framework Maint & Expan	All Mitigations	AX	300	
111	5287160	AM: Insp & Surv Prog - Penstocks & Sipho	M1 - Component Replacement or Repair Civil	AX	950	
112	5287169	AM: Insp & Surv Program - Canals & Flume	M1 - Component Replacement or Repair Civil	AX	950	
113	5287171	AM: Inspection Coordination Work	All Mitigations	AX	500	
114	5287174	AM: Maintenance Design	All Mitigations	AX	950	
115	5287177	Turbine Runner Maintenance/Welding	M3 - Component Replacement or Repair Mechanical	KH	1,500	
116	5272652	Power Gen Tree Mortality (VMBA)	C4 - Controls related to External Events	IG	3,000	
			Total		**66,137**	
					123,135	

Pacific Gas and Electric Company
2027 General Rate Case
Exhibit (PG&E-05) Chapter 3
Year-Over-Year Recorded Expense Variance Summary in Dollars
(Thousands of Nominal Dollars)

Line No.	Exhibit	Chapter	MWC	MWC Description	2020 Recorded	2021 Recorded	Variance	Variance Required Yes/No	Variance Explanation	Percentage Change
1	5	3	AB	Misc Expense	7,212	7,105	(107)	No	NA	-1%
2	5	3	AK	Manage Environmental Oper	1,046	963	(84)	Yes	Net adjustment for yearly cost fluctuations in managing the environmental operations of various watersheds	-8%
3	5	3	AX	Maint Resv,Dams&Waterways	27,996	29,791	1,796	No	NA	6%
4	5	3	AY	Habitat and Species Protection	112	77	(36)	Yes	Zebra Quagga Prevention Program	-32%
5	5	3	BC	Perf Reimburs Wk for Oth	(115)	(129)	(14)	Yes	Net adjustment for yearly cost fluctuations in reimbursable work of various watersheds	12%
6	5	3	EP	Manage Property & Bldgs	1,461	1,287	(175)	Yes	Net adjustment for yearly cost fluctuations in managing the land rights of various watersheds	-12%
7	5	3	IG	Manage Var Bal Acct Processes	18,812	22,995	4,183	Yes	Increase due to FERC fees and spillway assessment implementation program (SAIP) costs	22%
8	5	3	KG	Operate Hydro Generation	44,462	43,123	(1,339)	No	NA	-3%
9	5	3	KH	Maint Hydro Generating Equip	23,094	20,781	(2,313)	Yes	Lower standard cost variance in 2021 compared to 2020.	-10%
10	5	3	KI	Maint Hydro Bldg,Grnd,Infrast	9,080	10,399	1,319	Yes	Net adjustment for yearly cost fluctuations for maintaining facilities and infrastructure	15%
11	5	3	KJ	License Compliance Hydro Gen	22,115	23,006	891	No	NA	4%
12	5	3	OM	Operational Management	2,794	3,090	296	Yes	Net adjustment for yearly cost fluctuations in operation management	11%
13	5	3	OS	Operational Support	2,836	1,675	(1,161)	Yes	Net adjustment for yearly cost fluctuations in operation support	-41%

Pacific Gas and Electric Company
2027 General Rate Case
Exhibit (PG&E-05) Chapter 3
Year-Over-Year Recorded Expense Variance Summary in Dollars
(Thousands of Nominal Dollars)

Line No.	Exhibit	Chapter	MWC	MWC Description	2021 Recorded	2022 Recorded	Variance	Variance Required Yes/No	Variance Explanation	Percentage Change
1	5	3	AB	Misc Expense	7,105	5,754	(1,351)	Yes	Decrease in ISO 55000 certification costs and decrease in standard cost variance	-19%
2	5	3	AK	Manage Environmental Oper	963	966	4	No	NA	0%
3	5	3	AX	Maint Resv,Dams&Waterways	29,791	21,948	(7,843)	Yes	Completion of Almanor Dredge Prattville Intake project in 2021	-26%
4	5	3	AY	Habitat and Species Protection	77	101	24	Yes	Increase in Zebra Quagga Prevention Program costs in 2022	31%
5	5	3	BC	Perf Reimburs Wk for Oth	(129)	(643)	(514)	Yes	Net adjustment for yearly cost fluctuations in reimbursable work of various watersheds	399%
6	5	3	EP	Manage Property & Bldgs	1,287	1,887	600	Yes	Net adjustment for yearly cost fluctuations in managing the land rights of various watersheds	47%
7	5	3	IG	Manage Var Bal Acct Processes	22,995	32,728	9,733	Yes	Increase in Potter Valley license surrender costs and Bucks Creek license condition costs	42%
8	5	3	KG	Operate Hydro Generation	43,123	38,864	(4,259)	No	NA	-10%
9	5	3	KH	Maint Hydro Generating Equip	20,781	21,408	627	No	NA	3%
10	5	3	KI	Maint Hydro Bldg,Grnd,Infrast	10,399	9,864	(535)	Yes	Net adjustment for yearly cost fluctuations for maintaining facilities and infrastructure	-5%
11	5	3	KJ	License Compliance Hydro Gen	23,006	22,229	(777)	No	NA	-3%
12	5	3	OM	Operational Management	3,090	2,360	(730)	Yes	Net adjustment for yearly cost fluctuations in operation management	-24%
13	5	3	OS	Operational Support	1,675	8,030	6,355	Yes	Net adjustment for yearly cost fluctuations in operation support	379%

Pacific Gas and Electric Company
2027 General Rate Case
Exhibit (PG&E-05) Chapter 3
Year-Over-Year Recorded Expense Variance Summary in Dollars
(Thousands of Nominal Dollars)

Line No.	Exhibit	Chapter	MWC	MWC Description	2022 Recorded	2023 Recorded	Variance	Variance Required Yes/No	Variance Explanation	Percentage Change
1	5	3	AB	Misc Expense	5,754	4,909	(845)	Yes	Net Adjustments for yearly cost fluctuations for managing Hydro Power Generation's contracts and land conservation commitments	-15%
2	5	3	AK	Manage Environmental Oper	966	839	(127)	Yes	Net adjustment for yearly cost fluctuations in managing the environmental operations of various watersheds	-13%
3	5	3	AX	Maint Resv,Dams&Waterways	21,948	29,895	7,946	Yes	Increase in Butte Canal restoration costs and spillway vegetation management costs	36%
4	5	3	AY	Habitat and Species Protection	101	145	44	Yes	Zebra Quagga Prevention Program	44%
5	5	3	BC	Perf Reimburs Wk for Oth	(643)	353	996	Yes	Net adjustment for yearly cost fluctuations in reimbursable work of various watersheds	-155%
6	5	3	EP	Manage Property & Bldgs	1,887	1,940	52	No	NA	3%
7	5	3	IG	Manage Var Bal Acct Processes	32,728	27,117	(5,612)	Yes	Reduction in Potter Valley License Surrender costs	-17%
8	5	3	KG	Operate Hydro Generation	38,864	39,546	682	No	NA	2%
9	5	3	KH	Maint Hydro Generating Equip	21,408	24,439	3,030	Yes	Net adjustment for yearly cost fluctuations in maintaining various generation facilities	14%
10	5	3	KI	Maint Hydro Bldg,Grnd,Infrast	9,864	13,587	3,723	Yes	Net adjustment for yearly cost fluctuations for maintaining facilities and infrastructure	38%
11	5	3	KJ	License Compliance Hydro Gen	22,229	24,420	2,192	No	NA	10%
12	5	3	OM	Operational Management	2,360	2,323	(37)	No	NA	-2%
13	5	3	OS	Operational Support	8,030	10,318	2,287	Yes	Net adjustment for yearly cost fluctuations in operation support	28%

Pacific Gas and Electric Company
2027 General Rate Case
Exhibit (PG&E-05) Chapter 3
Year-Over-Year Recorded Expense Variance Summary in Dollars
(Thousands of Nominal Dollars)

Line No.	Exhibit	Chapter	MWC	MWC Description	2023 Recorded	2024 Recorded	Variance	Variance Required Yes/No	Variance Explanation	Percentage Change
1	5	3	AB	Misc Expense	4,909	5,080	170	No	NA	3%
2	5	3	AK	Manage Environmental Oper	839	981	142	Yes	Net adjustment for yearly cost fluctuations in managing the environmental operations of various watersheds	17%
3	5	3	AX	Maint Resv,Dams&Waterways	29,895	35,932	6,037	Yes	ML Maint Reservoirs/Dams/Waterways and Asset Management Canal Blitz	20%
4	5	3	AY	Habitat and Species Protection	145	175	31	Yes	Zebra Quagga Prevention Program	21%
5	5	3	BC	Perf Reimburs Wk for Oth	353	(175)	(528)	Yes	Net adjustment for yearly cost fluctuations in reimbursable work of various watersheds	-150%
6	5	3	EP	Manage Property & Bldgs	1,940	1,926	(13)	No	NA	-1%
7	5	3	IG	Manage Var Bal Acct Processes	27,117	34,850	7,733	Yes	Increase in Potter Valley License Surrender costs and dam safety program costs	29%
8	5	3	KG	Operate Hydro Generation	39,546	40,707	1,161	No	NA	3%
9	5	3	KH	Maint Hydro Generating Equip	24,439	24,427	(12)	No	NA	0%
10	5	3	KI	Maint Hydro Bldg,Grnd,Infrast	13,587	12,418	(1,170)	No	NA	-9%
11	5	3	KJ	License Compliance Hydro Gen	24,420	26,110	1,689	No	NA	7%
12	5	3	OM	Operational Management	2,323	2,386	62	No	NA	3%
13	5	3	OS	Operational Support	10,318	14,241	3,924	Yes	Net adjustment for yearly cost fluctuations in operation support	38%

Pacific Gas and Electric Company
2027 GRC
Exhibit (PG&E-5), Chapter 3
Hydro Operations Costs
Capital Expenditures by Major Work Category
(Thousands of Nominal Dollars)

			Capital Expenditures											
No.	MWC	MWC Description	2020 Recorded Adjusted	2021 Recorded Adjusted	2022 Recorded Adjusted	2023 Recorded Adjusted	2024 Recorded Adjusted	2025 Forecast	2026 Forecast	2027 Forecast	2028 Forecast	2029 Forecast	2030 Forecast	Reference
1	5	Tools & Equipment	1,898	1,991	1,494	7,184	4,338	3,234	769	1,036	1,099	1,371	1,358	WP 3-64, Line 14
2	11	Relicensing Hydro Gen	567	524	633	918	1,122	600	1,165	1,541	-	-	-	WP 3-64, Line 22
3	12	Implement Environment Projects	84	24	26	34	200	-	37	540	80	-	-	WP 3-64, Line 27
4	2L	Instl/Rpl for Hydro Safety&Reg	29,592	27,219	27,606	25,396	70,347	70,247	46,075	55,202	55,682	57,052	31,764	WP 3-68, Line 252
5	2M	Instal/Repl Hydro Gneratng Eqp	94,880	114,434	114,150	115,908	196,209	127,175	118,896	202,981	209,832	200,121	243,622	WP 3-79, Line 940
6	2N	Instal/Repl Resv,Dams&Waterway	45,193	27,576	38,066	46,960	102,324	88,716	79,164	71,234	98,012	82,959	105,377	WP 3-85, Line 1332
7	2P	Instl/Repl Hydr BldgGrndInfrst	8,015	19,557	19,272	41,827	37,023	19,363	32,599	32,533	19,369	18,585	19,453	WP 3-90, Line 1605
8	3H	Hydroelec Lic & Lic Conditions	17,708	16,696	18,648	35,347	40,795	60,956	78,507	136,118	247,462	278,598	274,772	WP 3-95, Line 1919
9		**Grand Total**	**197,937**	**208,020**	**219,894**	**273,574**	**452,358**	**370,290**	**357,210**	**501,186**	**631,536**	**638,685**	**676,346**	Sum Lines 1-8

Pacific Gas and Electric Company
2027 GRC
Exhibit (PG&E-5), Chapter 3
Hydro Operations Costs
Forecast Capital Expenditures Summary
(Thousands of Nominal Dollars)

		Capital Expenditures							
Line No.	Description	2024 CWIP	2025 Forecast	2026 Forecast	2027 Forecast	2028 Forecast	2029 Forecast	2030 Forecast	Reference
1	Projects > $3 Million*	407,066	292,523	269,434	385,469	528,554	511,231	549,000	WP 3-62, Line 232
2	Other Work	117,247	77,767	87,776	115,717	102,982	127,454	127,347	WP 3-63, Line 9
3	**Total**	**524,313**	**370,290**	**357,210**	**501,186**	**631,536**	**638,685**	**676,346**	Line 1 + Line 2

4 * Planning orders where Construction Work in Progress (CWIP) Balance as of December 31, 2024 plus six years (2025-2030) of forecast.

Pacific Gas and Electric Company
2027 GRC
Exhibit (PG&E-5), Chapter 3
Hydro Operations Costs
Recorded CWIP and Forecast Capital Expenditures Details - Projects Over $3 Million*
(Thousands of Nominal Dollars)

					CWIP	Capital Expenditures							
Line No.	Planning Order	Description	MWC	Operative Date	2024 Recorded Adjusted	2025 Forecast	2026 Forecast	2027 Forecast	2028 Forecast	2029 Forecast	2030 Forecast	Subtotal	Reference
	MWC - 11	Relicensing Hydro Gen											
1	5733458	Battle Cr Salmon/Steelhead Phase 1A&2	11	Dec-2027	5,822	600	1,165	1,541	-	-	-	9,128	WP 3-177
2	Total				5,822	600	1,165	1,541	-	-	-	9,128	
	MWC - 2L	Instl/Rpl for Hydro Safety&Reg											
3	5742783	Pit 3 PH Seismic Retrofit	2L	Dec-2025	13,061	9,216	-	-	-	-	-	22,277	WP 3-330
4	5745679	Fordyce Dam Leakage Reduction DOE	2L	Oct-2029	-	7,840	10,870	11,138	15,441	10,850	-	56,140	WP 3-458
5	5751038	Kerckhoff 2 - Replace CO2 System	2L	Oct-2027	-	-	466	6,120	-	-	-	6,586	WP 3-293
6	5771199	Pit 7 Radial Gate1 Repl Arms & Trunnions	2L	Oct-2028	131	321	966	2,829	12,320	102	-	16,669	WP 3-485
7	5771200	Pit 6 Radial Gate1 Repl Arms & Trunnions	2L	Dec-2029	274	-	215	1,148	2,305	12,962	92	16,996	WP 3-482
8	5772734	Poe PH Deck/Roof Resurface	2L	Dec-2025	3,126	-	-	-	-	-	-	3,126	WP 3-370
9	5774800	Crane Valley Dam-Intake Twr Seismic Upgr	2L	Dec-2027	2,325	364	1,249	5,550	15	-	-	9,502	WP 3-438
10	5776722	Pit 6 Radial Gate2 Repl Arms & Trunnions	2L	Nov-2032	-	-	-	-	317	1,608	2,811	4,736	WP 3-482
11	5776723	Pit 7 Radial Gate2 Repl Arms & Trunnions	2L	Nov-2030	-	-	-	274	1,182	2,600	11,917	15,973	WP 3-485
12	5779442	Helms Ventilation Upgrade	2L	Dec-2025	1,366	2,518	-	-	-	-	-	3,884	WP 3-272
13	5783541	Lower Bucks Dam Resurface DS Face	2L	Oct-2028	695	773	373	12,002	10,711	260	-	24,813	WP 3-469
14	5788250	Poe Dam Install Ped Bridge & Survey Plat	2L	Dec-2025	1,411	1,971	-	-	-	-	-	3,382	WP 3-364
15	5789325	CVD Repl Gates, Stems, Guides & Actuator	2L	Oct-2027	878	560	1,686	5,651	-	-	-	8,776	WP 3-438
16	5797722	Caribou 2 PH U5 Upgr Gen Protect Relays	2L	Apr-2025	5,833	-	-	-	-	-	-	5,833	WP 3-196
17	5800778	Balch 2 – Arc Flash Mitigation of Overst	2L	Mar-2028	191	-	181	3,605	500	-	-	4,476	WP 3-169
18	5802281	Helms – Replace Gen CO2 Fire System	2L	Dec-2025	2,562	586	-	-	-	-	-	3,148	WP 3-254
19	5804258	Pit 4 PH Install Stop Log Gate Hoists	2L	Dec-2029	8	-	-	-	873	2,104	144	3,130	WP 3-338
20	5810107	Fordyce Dam Install Plinth	2L	Dec-2025	8,279	40,522	-	-	-	-	-	48,801	WP 3-458
21	5810108	Fordyce Dam Install Carpi Liner	2L	Oct-2026	4,008	-	21,099	-	-	-	-	25,107	WP 3-458
22	5810379	San Joaquin 3 Mitigate Ground Grid	2L	Aug-2030	-	-	-	119	459	780	2,343	3,701	WP 3-400
23	5811968	Pit 5 Penstock Geotechnical Hardening	2L	Mar-2029	-	-	-	-	138	3,121	-	3,258	WP 3-351
24	5812287	Caribou 1 Intake Seismic Improvements	2L	Dec-2030	-	-	-	95	138	520	5,623	6,376	WP 3-212
25	Total				44,147	64,671	37,105	48,530	44,397	34,907	22,930	296,688	
	MWC - 2M	Instal/Repl Hydro Gneratng Eqp											
26	5500325	Shasta Inst/Repl Hydro Generating Equip	2M		-	900	769	1,036	1,099	1,371	1,358	6,533	Recurring Work/Standing Planning order
27	5500327	Drum Inst/Repl Hydro Generating Equip	2M		207	900	769	1,036	1,099	1,371	1,358	6,740	Recurring Work/Standing Planning order
28	5500328	MLode Inst/Repl Hydro Generating Equip	2M		321	900	769	1,036	1,099	1,371	1,358	6,854	Recurring Work/Standing Planning order
29	5501133	DeSabla Repl Obsol/Deteriorated Eqpt/Fac	2M		-	900	769	1,036	1,099	1,371	1,358	6,533	Recurring Work/Standing Planning order
30	5502519	KCV Replace Obsolete/Deteriorated Eqpt	2M		53	900	769	1,057	1,099	1,371	1,358	6,606	Recurring Work/Standing Planning order
31	5502521	Helms Repl Obsolete/Deteriorated Eqpt	2M		-	900	769	1,036	1,099	1,371	1,358	6,533	Recurring Work/Standing Planning order
32	5720513	Salt Springs 1 Rewind Generator	2M	Dec-2030	119	-	-	-	67	1,682	5,657	7,524	WP 3-397
33	5720657	Caribou 1 PH Rewind U2	2M	Feb-2028	3,280	-	817	9,244	459	-	-	13,799	WP 3-196
34	5720659	Caribou 2-5 Rewind	2M	Dec-2025	23,869	2,502	-	-	-	-	-	26,371	WP 3-196
35	5720716	Pit 7 U1 Replace Runner	2M	Dec-2030	-	-	-	143	275	1,248	7,685	9,351	WP 3-360
36	5720719	Pit 6 PH U1 Upgrade Turbine	2M	Dec-2030	122	-	-	659	564	4,388	7,781	13,514	WP 3-358
37	5720720	Pit 6 PH U2 Upgrade Turbine	2M	Dec-2030	126	-	179	3,793	564	4,388	7,781	16,832	WP 3-358
38	5720726	Caribou 1 U2 Repl Runners-Bearing-Shaft	2M	Dec-2028	6,022	4,234	3,865	13,329	3,874	-	-	31,324	WP 3-196
39	5720727	Caribou 1 U3 Repl Rnnr, Brng, Shft & Ndl	2M	Dec-2030	-	-	-	95	1,147	5,201	7,029	13,472	WP 3-196
40	5720747	Pit 4 U1 Rewind Generator Stator	2M	Dec-2030	-	-	-	143	1,376	5,721	5,389	12,629	WP 3-347

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					CWIP	Capital Expenditures							
Line No.	Planning Order	Description	MWC	Operative Date	2024 Recorded Adjusted	2025 Forecast	2026 Forecast	2027 Forecast	2028 Forecast	2029 Forecast	2030 Forecast	Subtotal	Reference
41	5734298	Caribou 1 PH Upg U2 Governor Controls	2M	Dec-2028	224	-	1,009	3,595	734	-	-	5,562	WP 3-196
42	5739698	Balch 1 - Replace Governor	2M	Dec-2029	676	-	347	572	2,081	683	-	4,359	WP 3-163
43	5745715	Salt Springs 2 Repl Runner,Needles,Seats	2M	Oct-2028	676	-	233	951	2,723	256	-	4,839	WP 3-397
44	5747177	Bucks Cr PH Repl U2 Turb Brg / Shaft	2M	Jan-2023	22,286	-	-	-	-	-	-	22,286	WP 3-187
45	5747208	DeSabla Rewind Generator	2M	May-2030	-	-	-	119	2,752	3,121	4,686	10,678	WP 3-216
46	5758119	Balch 2 - U2 Repl Cooling Water Piping	2M	Oct-2027	3,144	1,455	155	998	-	-	-	5,752	WP 3-173
47	5758136	Helms - Switchyard Emerg Access/Elevator	2M	Oct-2027	5,387	-	-	-	-	-	-	5,387	WP 3-266
48	5759145	Kerckhoff 2 - Kerckhoff 2 – Overhaul Wic	2M	Dec-2030	227	-	-	-	309	376	2,183	3,095	WP 3-291
49	5760011	Pit 3 Powerhouse Replace AC/DC Panel	2M	Jun-2027	675	253	2,270	1,930	-	-	-	5,129	WP 3-328
50	5760038	Bucks Creek U2 Rewind Generator	2M	Jun-2027	14,989	-	-	-	-	-	-	14,989	WP 3-187
51	5760154	Spaulding 1 TSV Refurbishment	2M	Oct-2028	136	-	449	728	3,929	204	-	5,445	WP 3-408
52	5760167	Cresta PH Replace U1 Exciter	2M	Oct-2028	204	808	1,453	2,794	306	46	-	5,611	WP 3-205
53	5760617	Balch 2 U3 Replace Cooling Water Piping	2M	Oct-2026	2,756	2,016	910	-	-	-	-	5,682	WP 3-173
54	5760650	Cresta PH Crane Upgrade	2M	Jun-2027	1,448	-	3,512	6,176	-	-	-	11,137	WP 3-208
55	5760652	Cresta PH Replace U2 Exciter	2M	Dec-2030	441	844	1,506	3,003	340	414	49	6,598	WP 3-205
56	5760669	Drum 2 U5 Rewind	2M	Oct-2027	123	-	1,165	7,703	2,294	-	-	11,284	WP 3-220
57	5760722	Salt Springs 2 Repl Accum & PSV cntrls	2M	Oct-2028	-	-	233	476	3,011	256	-	3,976	WP 3-397
58	5761119	Pit 1 U2 Upgrade Generator Relays	2M	Dec-2027	1,783	-	-	2,054	-	-	-	3,837	WP 3-324
59	5762320	Pit 5 U1 Replace Excitation System	2M	Oct-2026	1,733	820	1,073	-	-	-	-	3,626	WP 3-354
60	5762324	Pit 3 PH U2 Upgr Runner WG & Seal Rings	2M	Dec-2029	1,462	-	168	5,970	3,561	3,113	106	14,380	WP 3-328
61	5762329	Kerckhoff 2 - Generator Rewind/Restack	2M	Mar-2030	-	-	-	-	459	2,080	4,686	7,225	WP 3-284
62	5766152	Pit 4 Replace Generator Air Breakers	2M	Dec-2025	5,105	5,806	-	-	-	-	-	10,911	WP 3-344
63	5766154	JBB PH U1 Upgrade Governor Controls	2M	Oct-2026	1,853	-	6,873	71	-	-	-	8,797	WP 3-278
64	5766241	Tiger Creek U2 Exciter Replacement	2M	Mar-2026	766	2,138	422	-	-	-	-	3,326	WP 3-416
65	5767981	Caribou 1 U3 Upgrade Gov Controls	2M	Dec-2029	29	-	-	239	1,376	3,121	-	4,765	WP 3-196
66	5768002	JBB PH U2 Upgrade Governor Controls	2M	Mar-2026	765	7,625	116	-	-	-	-	8,507	WP 3-278
67	5768012	Poe Unit 2 Excitation System Replacement	2M	Dec-2025	2,390	2,048	-	-	-	-	-	4,438	WP 3-370
68	5778043	Helms - U1 Repl TSV	2M	Mar-2029	5,974	5,943	3,353	2,774	13,156	1,857	-	33,058	WP 3-237
69	5778044	Helms - U2 Repl TSV	2M	Mar-2029	6,435	3,694	5,642	2,854	13,242	1,876	-	33,743	WP 3-237
70	5778045	Helms - U3 Repl TSV	2M	Dec-2027	8,306	4,713	18,268	3,464	-	-	-	34,751	WP 3-237
71	5778054	Spring Gap PH - Generator Rewind	2M	Dec-2028	279	-	56	1,814	4,628	180	65	7,024	WP 3-410
72	5778900	Tiger Creek U2 Rewind	2M	Oct-2027	2,440	-	1,738	4,384	-	-	-	8,562	WP 3-416
73	5778976	JBB PH U2 Replace Transformer	2M	Dec-2025	2,035	8,097	233	-	-	-	-	10,365	WP 3-278
74	5779418	Balch 1 - Replace PSV	2M	Oct-2028	2,461	-	1,633	3,783	1,390	-	-	9,268	WP 3-161
75	5779423	Belden PH Refurbish TSV	2M	Dec-2025	5,416	3,643	-	-	-	-	-	9,060	WP 3-185
76	5779424	Bucks Cr PH Repl U1 Bearings and Shaft	2M	Dec-2030	-	-	-	-	138	1,560	2,343	4,041	WP 3-194
77	5779526	Poe PH Trxfmr Repl Bank 1	2M	Mar-2029	401	-	910	1,129	1,674	1,872	-	5,987	WP 3-370
78	5779527	Poe PH Refurb U2 PRV	2M	Nov-2030	-	-	-	190	459	1,040	1,593	3,282	WP 3-370
79	5780659	Balch 2 - Bank 3 Replacement	2M	Oct-2028	890	-	429	5,626	2,130	-	-	9,076	WP 3-171
80	5781045	Halsey TSV Actuator Replacement	2M	Dec-2031	13	-	-	-	-	780	3,280	4,073	WP 3-235
81	5781162	Cresta PH U2 Rewind	2M	Dec-2031	3,359	-	0	(0)	(0)	125	9,372	12,855	WP 3-205
82	5781191	JBB U2 Replace CT, PT, SA & Bus Duct	2M	Dec-2030	-	-	-	-	229	2,262	2,140	4,632	WP 3-280
83	5783073	Salt Springs 2 Repl Coils, RTDs, Bearing	2M	Nov-2028	-	-	233	476	2,569	156	-	3,434	WP 3-397
84	5783125	Helms Replace 13.8kV Breakers	2M	Mar-2027	668	757	1,873	313	-	-	-	3,611	WP 3-256
85	5788224	Helms PH to Swyd Control Wiring Rpl	2M	Mar-2027	529	-	5,218	951	-	-	-	6,699	WP 3-242

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86	5788228	Balch 2 Bank 2 Replacement	2M	Mar-2028	873	-	426	6,501	1,384	-	-	9,183	WP 3-171
87	5788247	Poe GSU Transformer Repl Bank 2	2M	Feb-2030	-	-	-	190	275	1,560	2,343	4,369	WP 3-370
88	5792369	West Point Rewind Generator	2M	Dec-2025	8,225	2,826	-	-	-	-	-	11,051	WP 3-427
89	5792938	Kings River GSU Bank Replacement	2M	Oct-2028	469	-	426	599	2,530	15	-	4,039	WP 3-306
90	5792950	Kerckhoff 2 - Mitigate Arc Flash 480v	2M	Oct-2026	451	2,663	1,357	-	-	-	-	4,471	WP 3-289
91	5793576	Stanislaus Refurbish TWD 1	2M	Dec-2029	130	357	237	712	237	1,992	51	3,716	WP 3-412
92	5793621	Stan PH Rpl Thrust Bearing Cooling Coil	2M	Dec-2031	6,264	-	-	-	-	-	-	6,264	WP 3-414
93	5798259	Belden PH Repl WG Bushings and FPs	2M	May-2032	3,155	-	238	314	325	395	382	4,808	WP 3-185
94	5798387	Kings River - ReplaceTSV	2M	Dec-2025	5,612	5,369	-	-	-	-	-	10,981	WP 3-301
95	5798518	Caribou 1 PH U2 Upgr Gen Protect Relays	2M	Mar-2028	143	-	233	3,089	367	-	-	3,832	WP 3-196
96	5799218	Pit 3 Replace GSU Transformer	2M	Oct-2026	4,011	-	451	-	-	-	-	4,462	WP 3-328
97	5800699	Bucks Creek PH U2 Replace Rotor	2M	Dec-2024	9,390	-	-	-	-	-	-	9,390	WP 3-187
98	5801758	Poe PH Automation PHA	2M	Oct-2029	5,076	-	292	384	3,887	4,443	-	14,082	WP 3-378
99	5802630	West Pt Upgr Gen Instruments SCADA RTDs	2M	Dec-2025	2,394	617	-	-	-	-	-	3,012	WP 3-427
100	5802631	West Point Replace Generator Exciter	2M	Oct-2027	14	513	399	2,575	-	-	-	3,499	WP 3-427
101	5802885	Rock Creek PH Repl GSU XFMR Bank 1ABC&SF	2M	Dec-2030	194	-	64	2,035	2,417	2,134	1,801	8,644	WP 3-388
102	5803278	Pit 6 PH U1 Repl CT, PT, SA ,& Bus Duct	2M	Jun-2030	-	-	-	122	309	2,421	2,290	5,142	WP 3-356
103	5803281	Pit 7 PH U2 Replace CT, SA, & Bus Duct	2M	Oct-2029	65	-	-	492	945	1,789	-	3,290	WP 3-362
104	5803541	Wise 1 PH Automation PHA	2M	Oct-2028	744	-	21	433	1,784	190	-	3,172	WP 3-431
105	5804208	Pit 4 Unit 2 PH Automation PHA	2M	Aug-2029	-	-	-	143	1,009	1,815	187	3,154	WP 3-378
106	5804584	Cresta Phase 2 PH Automation PHA	2M	Oct-2029	97	-	125	249	1,618	1,564	-	3,654	WP 3-378
107	5805941	Cresta PH U1 Upgrade Turbine	2M	Dec-2031	174	-	155	476	1,647	1,867	3,550	7,868	WP 3-205
108	5805969	JBB & IC LLO Install Fiber Cable	2M	Mar-2028	18	891	389	2,979	790	-	-	5,066	WP 3-276
109	5806386	Cresta PH Repl GSU XFMR Bank 1 ABC & SP	2M	Oct-2029	189	-	2,179	1,356	1,455	3,262	-	8,441	WP 3-205
110	5806397	Drum 1-4 PH Automation PHA	2M	Oct-2029	9	-	-	420	233	4,473	117	5,251	WP 3-218
111	5806540	Helms U2 Refurb Wicket Gate Servo	2M	Dec-2028	0	-	-	521	3,219	287	-	4,027	WP 3-242
112	5806541	K2 Replace Cooling Water System	2M	Dec-2030	-	-	155	190	183	208	2,999	3,736	WP 3-285
113	5806620	Helms PSP 230KV Cable Fire System Refurb	2M	Oct-2029	-	-	-	143	1,147	2,080	70	3,440	WP 3-258
114	5808344	Rock Creek PH Repl GSU XFMR Banks 2ABC	2M	Oct-2029	17	-	78	2,157	1,927	4,421	-	8,599	WP 3-388
115	5808902	AG Wishon - Replace Exciter	2M	Jul-2030	-	-	-	119	229	1,560	1,874	3,783	WP 3-157
116	5808961	Belden PH Replace Seal Rings	2M	Dec-2025	1,353	1,794	-	-	-	-	-	3,147	No Forecast - 2027-30
117	5809139	Helms U2 Gov Comp Lifecycle Rplc	2M	Mar-2028	-	-	116	1,541	1,697	-	-	3,354	WP 3-270
118	5809582	Pit 1 PH U1 & U2 Automation PHA	2M	Oct-2028	-	-	248	1,046	1,601	208	-	3,104	WP 3-378
119	5809662	Spaulding 1 Tunnel Instl Training Wall	2M	Dec-2025	1,946	4,000	-	-	-	-	-	5,946	WP 3-404
120	5809738	Helms Unit 1 Draft Tube Gate Install	2M	Dec-2029	268	1,305	2,222	5,512	8,769	5,091	50	23,218	WP 3-237
121	5809739	Helms Unit 2 Draft Tube Gate Install	2M	Dec-2031	-	-	-	-	688	1,325	24,028	26,041	WP 3-237
122	5809740	Helms Unit 3 Draft Tube Gate Install	2M	Dec-2029	493	-	1,088	1,725	4,071	20,551	217	28,144	WP 3-237
123	5809741	Helms Draft Tube Gate Tunnels	2M	Oct-2028	494	-	611	790	20,785	25	-	22,705	WP 3-237
124	5810198	Spaulding 1 PRV B Discharge Liner Rplc	2M	Dec-2025	495	23,828	-	-	-	-	-	24,322	WP 3-404
125	5810358	Helms U1-2-3 Replace kV Cables	2M	Dec-2030	-	-	-	119	229	1,560	2,343	4,251	WP 3-258
126	5810738	Helms U3 Rewind Starting Motor	2M	Dec-2030	104	-	1,150	5,132	12,935	6,491	5,623	31,436	WP 3-242
127	5811278	Helms Lifecycle Replacement – U1	2M	Dec-2029	-	911	3,890	6,563	10,310	11,921	485	34,079	WP 3-248
128	5811279	Helms Lifecycle Replacement – U2	2M	Dec-2030	-	801	3,258	4,811	6,817	10,080	335	26,102	WP 3-248
129	5811281	Helms Lifecycle Replacement – U3	2M	Dec-2031	-	911	3,890	6,563	10,310	11,921	38,406	72,000	WP 3-248
130	5812113	Salt Springs Dam Rplc 12 Gate Hoist	2M	Nov-2029	-	-	582	713	2,752	4,681	-	8,729	WP 3-490

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Line No.	Planning Order	Description	MWC	Operative Date	2024 Recorded Adjusted	2025 Forecast	2026 Forecast	2027 Forecast	2028 Forecast	2029 Forecast	2030 Forecast	Subtotal	Reference
131	5812188	Kings River Whole Unit Replacement	2M	Dec-2032	-	-	-	-	917	1,040	33,323	35,280	WP 3-306
132	5812241	SCADA 2026 RTU Life Cycle Replacement	2M	Dec-2026	-	-	3,105	-	-	-	-	3,105	WP 3-378
133	5812242	SCADA 2027 RTU Life Cycle Replacement	2M	Dec-2027	-	-	-	6,163	-	-	-	6,163	WP 3-378
134	5812243	SCADA 2028 RTU Life Cycle Replacement	2M	Dec-2028	-	-	-	-	5,255	-	-	5,255	WP 3-378
135	5812244	SCADA 2029 RTU Life Cycle Replacement	2M	Dec-2029	-	-	-	-	-	6,366	-	6,366	WP 3-378
136	5812245	SCADA 2030 RTU Life Cycle Replacement	2M	Dec-2030	-	-	-	-	-	-	5,623	5,623	WP 3-378
137	5812253	Bucks Creek PH Replace GSU XFMR Bank 1	2M	Dec-2030	-	-	-	-	183	1,040	1,874	3,098	WP 3-187
138	5812827	Hydro Modernization Program	2M	Dec-2024	-	-	4,771	10,000	10,000	11,000	11,000	46,771	WP 3-378
139	5812905	Rock Creek PH U2 Repl Gen Shaft	2M	Dec-2031	-	-	-	-	138	1,560	2,343	4,041	WP 3-388
140	Total				195,470	109,584	103,110	175,661	203,784	187,568	221,290	1,196,467	
	MWC - 2N	Instal/Repl Resv,Dams&Waterway											
141	5778440	Courtright Dam Upgrade I/D Gate Control	2N	Dec-2025	17,437	4,018	-	-	-	-	-	21,455	WP 3-435
142	5779023	Spaulding Dam 1 Install Log Booms	2N	Oct-2027	29	1,276	1,628	1,441	-	-	-	4,373	WP 3-500
143	5779209	Helms - Install Incline Tunnel Liner	2N	Dec-2025	8,814	433	-	-	-	-	-	9,248	WP 3-199
144	5779463	Poe Dam Replace Gate Chains & LS DOE	2N	Oct-2026	2,458	4,494	3,065	-	-	-	-	10,017	WP 3-366
145	5780885	Fordyce Dam Replace LLO and Guard Valves	2N	Dec-2029	1,874	-	333	773	6,619	1,080	300	10,980	WP 3-458
146	5783000	Lower Blue Seepage Reduction DOE	2N	Oct-2026	2,177	-	4,936	-	-	-	-	7,113	WP 3-312
147	5784683	Rock Creek Cresta Coffer Dam DOE	2N	Nov-2026	8,483	17,273	12,853	75	-	-	-	38,684	WP 3-494
148	5785096	Pit 3 LLO Replace No.1,2,3 Actuator	2N	Dec-2029	734	-	23	29	3,119	3,121	94	7,119	WP 3-479
149	5787970	Salt Springs Log Boom DOE	2N	Dec-2025	5,044	708	-	-	-	-	-	5,752	WP 3-497
150	5788227	Kerckchoff Replace Dam LLO Gate 1	2N	Oct-2026	539	5,575	4,602	48	-	-	-	10,765	WP 3-297
151	5788233	Salt Springs 1 Penstock Excess Flow Prot	2N	Dec-2025	3,871	47	-	-	-	-	-	3,918	WP 3-395
152	5792672	Bucks Creek Pnstk Upgr Erosion Protect	2N	Jun-2027	1,560	-	2,094	3,086	-	-	-	6,740	WP 3-192
153	5792675	Poe Dam Rpl Radial BP Gate Hoist & Cntrl	2N	Dec-2025	2,258	2,129	-	-	-	-	-	4,387	WP 3-490
154	5793557	Tiger Creek Abay Spillway Gates Automati	2N	Dec-2025	5,588	5,257	-	-	-	-	-	10,845	WP 3-509
155	5793565	BRC Relocate Ragsdale Racks	2N	Sep-2029	260	-	57	346	936	2,269	-	3,867	WP 3-183
156	5793571	Alta PH Penstock Bypass Install	2N	Oct-2026	486	983	1,657	47	-	-	-	3,172	WP 3-159
157	5797779	Pit 5 Dam Refurbish Left Wing Wall	2N	Oct-2026	773	305	4,112	24	-	-	-	5,213	WP 3-349
158	5798438	Relief Dam Resurface Upstream Liner	2N	Dec-2031	5,360	3,094	3,080	3,780	18,071	18,098	19,211	70,695	WP 3-520
159	5798454	Philadelphia Canal Road Improvements	2N	Dec-2028	55	-	122	246	3,063	-	-	3,485	WP 3-386
160	5798500	Pit 4 Dam Replace Steel Footbridge	2N	Oct-2026	353	305	3,592	-	-	-	-	4,250	WP 3-336
161	5798990	Lower Feely Crest Restoration Drum	2N	Dec-2025	1,630	1,634	-	-	-	-	-	3,265	WP 3-314
162	5800005	Poe Dam Toe Void Install Cutoff Wall DOE	2N	Oct-2027	811	200	1,166	5,162	92	-	-	7,431	WP 3-368
163	5800748	Pit 3 Dam Rest Plunge Pool & Wing Wall	2N	Oct-2028	214	-	279	407	7,106	26	-	8,032	WP 3-477
164	5801336	Hat Creek 1 Refb Canal and Embankment	2N	Dec-2025	278	3,734	-	-	-	-	-	4,012	WP 3-199
165	5802633	Sand Bar Dam Reduce Leakage	2N	Dec-2031	497	-	806	2,066	1,883	3,121	25,000	33,372	WP 3-402
166	5802821	Upper Peak Mitigate Seismic Deformation	2N	Dec-2027	307	-	102	3,749	101	-	-	4,259	WP 3-512
167	5802878	Belden Intake Structure Seismic Improve	2N	Dec-2031	38	-	82	238	275	312	4,686	5,631	WP 3-212
168	5802898	Kerckhoff Dam Inst Auto Gate Hoists 1-14	2N	Dec-2028	373	256	86	2,018	10,290	89	-	13,112	WP 3-490
169	5806780	Relief Spillway Impr Lower Training Wall	2N	Oct-2031	-	-	-	285	688	2,600	2,343	5,917	WP 3-381
170	5806840	Caribou 2 PH Intake Seismic Improvements	2N	Dec-2028	17	-	230	285	4,587	-	-	5,120	WP 3-212
171	5807220	Spaulding Dam 1 Replace LLO	2N	Dec-2029	625	16,031	14,595	20,251	14,476	11,747	539	78,265	WP 3-503
172	5809060	Courtright - Dam Concrete Liner Repairs	2N	Dec-2025	5,690	280	-	-	-	-	-	5,970	WP 3-433
173	5811074	Hendricks Canal Lining Improvements	2N	Dec-2032	-	-	-	2,054	1,835	2,080	1,874	7,844	WP 3-199

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(Thousands of Nominal Dollars)

					CWIP	Capital Expenditures							
Line No.	Planning Order	Description	MWC	Operative Date	2024 Recorded Adjusted	2025 Forecast	2026 Forecast	2027 Forecast	2028 Forecast	2029 Forecast	2030 Forecast	Subtotal	Reference
174	5812025	2029 Annual Canal Liner Improvements	2N	Nov-2029	-	-	-	-	-	3,121	28	3,149	WP 3-199
175	5812062	Lower Peak Dam Replace LLO & Valves	2N	Jun-2032	-	-	-	-	275	2,080	1,874	4,230	WP 3-444
176	5812088	Bear River Canal Instrumentation Upgrade	2N	Oct-2030	-	-	-	-	229	2,080	1,874	4,184	WP 3-199
177	5812248	Belden Dam Repl Radial Gates Hoist	2N	Dec-2030	-	-	-	-	-	780	2,811	3,592	WP 3-490
178	5812324	Lake Almanor Dam Intake Tower Retrofit	2N	Dec-2030	-	-	-	238	229	1,560	4,217	6,245	WP 3-444
179	5812668	Kerckoff Dam Rplc Spillway Gates 10 -14	2N	Dec-2030	-	-	-	143	413	3,121	6,560	10,236	WP 3-490
180	Total				78,634	68,035	59,500	46,790	74,290	57,285	71,412	455,946	
	MWC - 2P	Instl/Repl Hydr BldgGrndInfrst											
181	5778990	Lake Valley Canal Convert to Pipe	2P	Oct-2033	-	-	-	-	321	520	3,280	4,121	WP 3-199
182	5779575	Electra PH Crane Modernization	2P	Dec-2029	0	-	-	-	1,835	2,080	-	3,916	WP 3-226
183	5779576	Tiger Creek PH Crane Modernization	2P	Mar-2026	257	3,138	454	-	-	-	-	3,850	WP 3-418
184	5779577	Salt Springs PH Crane Modernization	2P	Dec-2027	40	-	866	2,144	76	-	-	3,126	WP 3-397
185	5783123	Helms Install Backup Power at Portal	2P	Nov-2028	3,380	1,332	790	2,413	4,688	461	-	13,063	WP 3-250
186	5791558	Haas – Upgrade Crane Controls	2P	Dec-2028	285	0	55	566	3,707	-	-	4,612	WP 3-233
187	5792458	Pit 4 PH Upgrade Crane(s)	2P	Dec-2027	95	-	2,525	5,285	-	-	-	7,905	WP 3-342
188	5792563	JBB Willow Creek Rd Stabilization	2P	Oct-2026	363	401	5,749	95	-	-	-	6,609	WP 3-282
189	5792584	Pit 3 Repave Road	2P	Oct-2026	650	-	4,203	95	-	-	-	4,948	WP 3-333
190	5797658	Pit 5 Surge Chmbr & VH Sld Stabilization	2P	Dec-2025	894	4,126	-	-	-	-	-	5,020	WP 3-352
191	5798384	Helms - Stabilize Xfmr Gallery Ceiling	2P	Dec-2029	171	-	-	130	713	2,361	45	3,420	WP 3-264
192	5798499	Pit 3 Tailrace Bridge Refb Pier Voids	2P	Oct-2027	15	-	39	7,191	92	-	-	7,336	WP 3-335
193	5804261	Balch 1 Rplc 115kv Switching Structure	2P	Mar-2028	65	-	193	3,159	624	-	-	4,041	WP 3-167
194	5805398	DeSabla PH Road Improvements	2P	Dec-2025	3,996	1,500	-	-	-	-	-	5,496	WP 3-386
195	5805958	Helms DWP and Sump Pump Imprv	2P	Oct-2027	403	1,387	142	1,133	-	-	-	3,064	WP 3-252
196	Total				10,614	11,884	15,016	22,212	12,055	5,422	3,325	80,528	
	MWC - 3H	Hydroelec Lic & Lic Conditions											
197	5718898	Battle Cr Salmon Restoration FERC Lic Am	3H	Dec-2025	5,088	200	-	-	-	-	-	5,288	WP 3-179
198	5720508	Drum-Spaulding Lic Cond	3H	Dec-2030	-	-	-	414	3,176	8,784	13,727	26,101	WP 3-222
199	5767854	Balch 1 & 2 Relicensing	3H	Mar-2029	8,767	1,886	1,578	1,375	803	808	-	15,216	WP 3-175
200	5779438	Helms Relicensing FERC #2735	3H	Mar-2029	13,650	3,036	2,558	2,225	1,695	1,767	-	24,931	WP 3-262
201	5781662	Poe LC- HEA Implementation	3H	Dec-2029	-	250	1,165	238	229	2,080	586	4,548	WP 3-393
202	5792732	Rock Creek Rsvr North Fencing - FSI	3H	Dec-2025	3,107	311	-	-	-	-	-	3,419	WP 3-452
203	5793127	Hat Creek #1 &#2 FERC-2661 Relicensing	3H	Dec-2030	-	300	414	778	2,557	2,371	1,091	7,512	WP 3-230
204	5794027	Butt Valley Spillway Improv SAIP	3H	Dec-2030	-	-	-	476	1,835	2,080	2,811	7,202	WP 3-381
205	5794031	Lower Bucks Spillway RestorationSAIP DOE	3H	Oct-2025	12,687	10,421	194	-	-	-	-	23,302	WP 3-381
206	5794032	McCloud Spillway Improvements SAIP	3H	Dec-2030	17,965	4,503	5,696	8,357	104,660	120,235	124,865	386,280	WP 3-472
207	5794035	Tiger Creek Reg Spillway Improv SAIP	3H	Jun-2030	9,496	1,312	26,195	42,197	19,776	7,676	3,701	110,354	WP 3-381
208	5798915	Crane Valley License Amendment	3H	Dec-2029	10	2,717	3,602	2,568	2,294	1,845	469	13,505	WP 3-203
209	5800548	MCPIT-LC Construct Pit 7 Dam Abay Bridge	3H	Aug-2032	-	-	-	-	-	3,462	9,563	13,025	WP 3-316
210	5800553	MCPIT-LC Const Star City Crk Camp & DUA	3H	Aug-2032	-	-	-	-	-	1,731	1,594	3,325	WP 3-316
211	5800599	MCPIT-LC Recnst Tarant Gulch Boat & DUA	3H	Aug-2032	-	-	-	-	-	2,077	1,913	3,990	WP 3-316
212	5800600	MCPIT-LC Reconstruct Project Roads	3H	Aug-2032	-	-	-	-	3,585	4,154	7,651	15,390	WP 3-316
213	5800601	MCPIT-LC IMPL Erosion & Sediment Mgt Pln	3H	Aug-2032	-	-	-	825	1,627	1,885	1,736	6,073	WP 3-316
214	5800602	MCPIT-LC McCloud Dam Improve LLO	3H	Dec-2029	-	-	1,307	6,811	11,414	13,311	1,308	34,151	WP 3-316

Pacific Gas and Electric Company
2027 GRC
Exhibit (PG&E-5), Chapter 3
Hydro Operations Costs
Recorded CWIP and Forecast Capital Expenditures Details - Projects Over $3 Million*
(Thousands of Nominal Dollars)

					CWIP	Capital Expenditures							
Line No.	Planning Order	Description	MWC	Operative Date	2024 Recorded Adjusted	2025 Forecast	2026 Forecast	2027 Forecast	2028 Forecast	2029 Forecast	2030 Forecast	Subtotal	Reference
215	5802314	BucksCreek LC Lwr Bucks Lake CG Upgr	3H	Dec-2029	-	-	156	253	294	2,678	37	3,418	WP 3-190
216	5802331	BucksCreekLC 3 Lakes Rd 15C Improvs	3H	Dec-2030	-	-	-	95	186	364	2,897	3,542	WP 3-190
217	5802861	Salmon HEA Implement - UNFFR LC	3H	Dec-2031	1,217	750	3,494	713	688	6,241	1,757	14,861	WP 3-393
218	5802888	UNFFR LC#Last Chance CG Upgr & Rec Plan	3H	Oct-2028	-	-	251	1,355	1,500	36	-	3,142	WP 3-422
219	5805416	Lake Almanor Spillway Joint Rpl SAIP -ST	3H	Oct-2028	-	4,500	3,882	7,190	6,422	-	-	21,994	WP 3-381
220	5808125	Belden Spillway Imprv Walls SAIP IRRM	3H	Dec-2029	317	6,500	1,165	2,054	16,515	10,402	47	36,999	WP 3-381
221	5808282	Lake Almanor Spillway Improv SAIP LT	3H	Dec-2030	-	-	-	238	229	2,080	1,874	4,422	WP 3-381
222	5808285	Belden Spillway Inst Log Boom SAIP IRRM	3H	Nov-2027	42	385	536	3,106	61	-	-	4,131	WP 3-381
223	5809023	Mokelumne FERC-137 Relicensing	3H	Dec-2031	31	679	1,077	5,098	4,654	2,311	2,554	16,405	WP 3-318
224	5812226	UNFFR LC Eastshore DUA Area Upgr	3H	Dec-2030	-	-	-	83	667	471	7,498	8,718	WP 3-422
225	5812227	UNFFR LC N.Shore Public Boat Launch Upgr	3H	Aug-2029	-	-	-	147	726	4,489	103	5,466	WP 3-422
226	5812234	DeSabla LC - Capital	3H	Dec-2032	-	-	269	988	4,505	9,292	8,553	23,606	WP 3-214
227	5812235	Helms Relicensing - Capital LC	3H	Dec-2032	-	-	-	0	-	-	17,025	17,025	WP 3-262
228	5812236	Kerckhoff 1 &2 Relicensing - Capital LC	3H	Dec-2032	-	-	-	2,863	3,265	11,876	2,634	20,637	WP 3-295
229	5812237	Balch 1 & 2 Relicensing - Capital LC	3H	Dec-2032	-	-	-	0	-	-	9,083	9,083	WP 3-175
230	5812238	Rock Creek-Cresta FERC-1962 Relicensing	3H	Dec-2032	-	-	-	285	665	1,541	4,966	7,457	WP 3-391
231	Total				72,379	37,750	53,538	90,735	194,028	226,048	230,043	904,521	
232		Grand Total			407,066	292,523	269,434	385,469	528,554	511,231	549,000	2,943,277	

233 * Planning orders where Construction Work in Progress (CWIP) Balance as of December 31, 2024 plus six years (2025-2030) of forecast.

Pacific Gas and Electric Company
2027 GRC
Exhibit (PG&E-5), Chapter 3
Hydro Operations Costs
Recorded and Forecast Capital Expenditures Details - Other Work*
(Thousands of Nominal Dollars)

			Capital Expenditures											
Line No.	MWC	MWC Description	2020 Recorded Adjusted	2021 Recorded Adjusted	2022 Recorded Adjusted	2023 Recorded Adjusted	2024 Recorded Adjusted	2025 Forecast	2026 Forecast	2027 Forecast	2028 Forecast	2029 Forecast	2030 Forecast	Reference
1	5	Tools & Equipment	1,898	1,991	1,494	7,184	4,338	3,234	769	1,036	1,099	1,371	1,358	
2	11	Relicensing Hydro Gen	139	(37)	21	2	36	-	-	-	-	-	-	
3	12	Implement Environment Projects	84	24	26	34	200	-	37	540	80	-	-	
4	2L	Instl/Rpl for Hydro Safety&Reg	25,743	13,560	14,623	12,595	9,473	5,576	8,970	6,672	11,286	22,145	8,833	
5	2M	Instal/Repl Hydro Gneratng Eqp	76,875	84,402	101,120	81,038	96,304	17,591	15,785	27,320	6,048	12,553	22,332	
6	2N	Instal/Repl Resv,Dams&Waterway	44,029	24,019	30,885	31,250	48,696	20,681	19,663	24,444	23,722	25,674	33,965	
7	2P	Instl/Repl Hydr BldgGrndInfrst	7,647	19,229	18,333	38,572	30,800	7,479	17,583	10,321	7,314	13,162	16,129	
8	3H	Hydroelec Lic & Lic Conditions	15,466	10,179	6,778	9,418	12,486	23,206	24,969	45,384	53,434	52,549	44,729	
9	**Grand Total**		**171,881**	**153,366**	**173,280**	**180,093**	**202,333**	**77,767**	**87,776**	**115,717**	**102,982**	**127,454**	**127,347**	

10 * Excludes projects greater than $3M

Pacific Gas and Electric Company
2027 GRC
Exhibit (PG&E-5), Chapter 3
Hydro Operations
Capital Expenditures by Planning Order
(Thousands of Nominal Dollars)

Line No.	MWC	Planning Order	Description	2020 Recorded	2021 Recorded	2022 Recorded	2023 Recorded	2024 Recorded	2025 Forecast	2026 Forecast	2027 Forecast	2028 Forecast	2029 Forecast	2030 Forecast	Reference
1	05	5500311	PE: Purchase Capital Tools	988	582	203	3,060	331	-	-	-	-	-	-	
2	05	5500312	Shasta Purchase Capital Tools/Eqpt	77	-	78	254	70	150	128	173	183	228	226	
3	05	5500313	DeSabla Purchase Capital Tools/Eqpt	277	75	15	271	207	150	128	173	183	228	226	
4	05	5500314	Drum Central Purchase Capital Tools	199	284	484	151	115	150	128	173	183	228	226	
5	05	5500315	MLode Purchase Capital Tools/Eqpt	101	180	89	1,248	401	150	128	173	183	228	226	
6	05	5500316	KCV Purchase Capital Tools/Eqpt	116	73	259	133	239	150	128	173	183	228	226	
7	05	5500317	Helms Purchase Capital Tools/Eqpt	66	136	21	480	495	150	128	173	183	228	226	
8	05	5542481	Water Mgmt. -- Capital Tools	56	-	-	131	54	50	-	-	-	-	-	
9	05	5549888	NERC Compliance -- Capital Tools	-	-	-	1,113	2,168	2,284	-	-	-	-	-	
10	05	5778311	PGen SCADA Lab Set-up	19	-	-	-	-	-	-	-	-	-	-	
11	05	5794458	AM: Capital Tools	-	661	289	326	190	-	-	-	-	-	-	
12	05	5800369	PE: Inspections Safety Capital Tools	-	-	55	18	3	-	-	-	-	-	-	
13	05	5813038	WCS and Monitoring IT solution	-	-	-	-	64	-	-	-	-	-	-	
14	**05**	**05 Total**		**1,898**	**1,991**	**1,494**	**7,184**	**4,338**	**3,234**	**769**	**1,036**	**1,099**	**1,371**	**1,358**	Sum of Lines 1-13
15	**05**														
16	11	5720817	Bass Lake Remove Molly Clayton Cabin	0	-	-	-	-	-	-	-	-	-	-	
17	11	5733458	Battle Cr Salmon/Steelhead Phase 1A&2	428	561	612	916	1,086	600	1,165	1,541	-	-	-	
18	11	5740319	Pit 345 LC Revegetation	-	(37)	-	-	-	-	-	-	-	-	-	
19	11	5752167	Battle Creek NFSL Additional Design Imp	139	-	-	-	-	-	-	-	-	-	-	
20	11	5766283	Caribou Camp Capital Improvements	-	-	-	-	35	-	-	-	-	-	-	
21	11	5797562	Pit 345 Ferry Crossing Campground Imprv	-	-	21	2	1	-	-	-	-	-	-	
22	**11**	**11 Total**		**567**	**524**	**633**	**918**	**1,122**	**600**	**1,165**	**1,541**	**-**	**-**	**-**	Sum of Lines 16-21
23	**11**														
24	12	5747226	Haas Remove OSPP	82	24	26	28	196	-	37	540	80	-	-	
25	12	5782984	Caribou 1 Switchyard Install SPCC	1	0	0	(2)	-	-	-	-	-	-	-	
26	12	5805440	MRCSC Install Sediment Prevention	-	-	-	8	3	-	-	-	-	-	-	
27	**12**	**12 Total**		**84**	**24**	**26**	**34**	**200**	**-**	**37**	**540**	**80**	**-**	**-**	Sum of Lines 24-26
28	**12**														
29	2L	5720809	Pit 6 Replace Stoplog Lifting Device	(9)	-	-	-	-	-	-	-	-	-	-	
30	2L	5720810	Pit 7 Replace Stoplog Lifting Device	78	-	-	-	-	-	-	-	-	-	-	
31	2L	5724979	Crane Valley Dam - Seismic Upgrade	(79)	-	-	-	-	-	-	-	-	-	-	
32	2L	5725958	Merced Falls - Remove Restroom	-	-	-	(13)	-	-	-	-	-	-	-	
33	2L	5730439	Cresta Arc Flash Remediation	12	21	235	96	-	-	-	-	-	-	-	
34	2L	5739709	Kings River Remove CO2 System	(7)	-	-	-	-	-	-	-	-	-	-	
35	2L	5739727	Balch 2 - U2/U3 Remove CO2 System	92	-	-	-	-	-	-	-	-	-	-	
36	2L	5742783	Pit 3 PH Seismic Retrofit	131	358	515	885	10,450	9,216	-	-	-	-	-	
37	2L	5745679	Fordyce Dam Leakage Reduction DOE	3,163	12,241	11,035	6,345	28,725	7,840	10,870	11,138	15,441	10,850	-	
38	2L	5747277	Pit 6 Replace Spillway Apron	538	(316)	-	-	-	-	-	-	-	-	-	
39	2L	5751038	Kerckhoff 2 - Replace CO2 System	19	20	63	1,547	155	-	466	6,120	-	-	-	
40	2L	5751059	Poe Dam Gate 3 Trunnion Replacement	4	-	-	-	-	-	-	-	-	-	-	
41	2L	5754965	Pit 7 PH47 Real Time Communication Upgra	27	10	9	9	5	-	-	-	-	-	-	
42	2L	5754970	Coleman Intk Siphns1&2 TrashRack Install	79	2	-	-	-	-	-	-	-	-	-	
43	2L	5760041	Lower Bucks Dam Install Upstream Liner	15,493	953	68	0	-	-	-	-	-	-	-	
44	2L	5760146	Narrows Draft Tube Platform Replacement	(136)	-	-	-	-	-	-	-	-	-	-	
45	2L	5760159	Stanislaus CO2 Fire Protection Systems	-	-	-	-	12	-	-	100	298	2,158	304	
46	2L	5760194	Centerville Improve Access Trail to BW98	(0)	-	-	-	-	-	-	-	-	-	-	
47	2L	5760424	PE: ISO Meter Replacement Phase 4 Capita	47	4	9	-	-	-	-	-	-	-	-	
48	2L	5760621	Belden Upgrade CO2 Fire System	-	-	-	20	70	-	596	-	-	-	-	
49	2L	5765479	Drum 1, Install SDS protection BK1 & BK2	0	-	-	-	-	-	-	-	-	-	-	
50	2L	5766248	Griswold Access Bridge Upgrade - DRM 53	-	-	-	47	464	-	21	26	422	-	-	
51	2L	5767386	Cresta PH Repl 480V Switchgear	19	-	-	-	-	-	-	-	-	-	-	
52	2L	5770998	Caribou 2 Penstock Slope Drain Improve	-	7	-	-	-	-	-	-	-	-	-	
53	2L	5771199	Pit 7 Radial Gate 1 Repl Arms & Trunnions	12	7	8	9	8	321	966	2,829	12,320	102	-	
54	2L	5771200	Pit 6 Radial Gate 1 Repl Arms & Trunnions	33	32	28	19	10	-	215	1,148	2,305	12,962	92	
55	2L	5771299	Crane Valley - Install Radial Gate Hoist	-	-	-	(53)	-	-	-	-	-	-	-	
56	2L	5771631	Haas - Instl Fire Det & Alarm Syst	36	16	-	-	-	-	-	-	-	-	-	
57	2L	5771818	PE: ISO Meter Replacement Phase 5 Capita	160	30	489	452	412	1,093	57	-	-	-	-	WP 3-320
58	2L	5772098	Inskip Diversion Install Dam Toe Buttres	726	(91)	-	-	-	-	-	-	-	-	-	
59	2L	5772623	Haas - Upgrade PH Ventilation System	125	1,013	394	5	-	-	-	-	-	-	-	
60	2L	5772630	Helms - Mercury Device Replacement	0	(2)	-	-	-	-	-	-	-	-	-	
61	2L	5772635	K2 - Upgrade Control Room Ventilation	0	(1)	-	-	-	-	-	-	-	-	-	
62	2L	5772734	Poe PH Deck/Roof Resurface	142	164	208	397	288	-	-	-	-	-	-	

Pacific Gas and Electric Company
2027 GRC
Exhibit (PG&E-5), Chapter 3
Hydro Operations
Capital Expenditures by Planning Order
(Thousands of Nominal Dollars)

Line No.	MWC	Planning Order	Description	2020 Recorded	2021 Recorded	2022 Recorded	2023 Recorded	2024 Recorded	2025 Forecast	2026 Forecast	2027 Forecast	2028 Forecast	2029 Forecast	2030 Forecast	Reference
63	2L	5772740	PV Recreation Erosion Control	(167)	-	-	-	-	-	-	-	-	-	-	
64	2L	5773121	Caribou PH Grnd Grid Mitigation Phase 2	0	-	-	-	-	-	-	-	-	-	-	
65	2L	5773911	PV Scott Dam Replace Radial Gate Hoist	2,092	966	817	111	-	-	-	-	-	-	-	
66	2L	5774800	Crane Valley Dam-Intake Twr Seismic Upgr	182	538	236	305	432	364	1,249	5,550	15	-	-	
67	2L	5775698	Spa 1 Snow Shed Stairway Improvements	2	-	-	-	-	-	-	-	-	-	-	
68	2L	5776218	Camp 9 Road MP2.5 Landslide Mitigation	(44)	(34)	-	-	-	-	-	-	-	-	-	
69	2L	5776722	Pit 6 Radial Gate2 Repl Arms & Trunnions	-	-	-	-	-	-	-	-	317	1,608	2,811	
70	2L	5776723	Pit 7 Radial Gate2 Repl Arms & Trunnions	-	-	-	-	-	-	-	274	1,182	2,600	11,917	
71	2L	5777316	Caribou 2 Refurb Txfrmer Bank 9	1	88	-	-	-	-	-	-	-	-	-	
72	2L	5777495	KI-22 Gage Access Ladder Replacement	267	41	104	258	685	911	-	-	-	-	-	
73	2L	5777563	Poe PH Repl 208V Circuit Breakers	34	6	32	-	-	-	-	-	-	-	-	
74	2L	5777916	Pit 5 Repl Turbine Maintenance Platform	8	-	-	-	-	-	-	-	-	-	-	
75	2L	5778072	Electra PH Replace Station Service Bk #1	2	-	-	-	-	-	-	-	-	-	-	
76	2L	5778259	Pit 6 PH Arc Flash Mitigation	1	(16)	-	-	-	-	-	-	-	-	-	
77	2L	5778260	PV Scott Dam Repl Floor in Bldg	1	0	0	0	0	-	-	-	-	-	-	
78	2L	5778263	Kunkle Reservoir Remove Co House	0	-	-	-	-	-	-	-	-	-	-	
79	2L	5778268	Cresta PH Repl Turbine Maint Platform	108	507	135	158	-	-	-	-	-	-	-	
80	2L	5778339	Helms - Instl Fall Protctn (LC Conduit)	0	-	-	-	-	-	-	-	-	-	-	
81	2L	5778340	Crane Valley - Instl HighFlow Gaging Sta	192	27	1	-	-	-	-	-	-	-	-	
82	2L	5779442	Helms Ventilation Upgrade	-	7	78	295	1,115	2,518	-	-	-	-	-	
83	2L	5779466	Round Valley Replace Log Boom	63	59	74	-	-	-	-	-	-	-	-	
84	2L	5780793	Kerckhoff 2 - Replace Interior Roof	86	86	3,472	67	-	-	-	-	-	-	-	
85	2L	5781778	Helms - Install Air Monitoring	132	19	4	-	-	-	-	-	-	-	-	
86	2L	5781918	Mother Lode Install Fencing (Pub Safety)	21	6	6	7	4	-	-	-	-	-	-	
87	2L	5782085	Spaulding 3 Install Fencing (Switchyard)	0	-	-	-	-	-	-	-	-	-	-	
88	2L	5782092	Fordyce Install New Ladder and Handrail	-	-	10	-	-	-	-	-	-	-	-	
89	2L	5782302	Drum Install Fencing (Pub Safety)	537	28	31	33	18	-	-	-	-	-	-	
90	2L	5782678	Poe PH U1 Upgrade Gen Mgmt Relay Pkg	-	-	-	-	19	-	-	309	908	1,144	-	
91	2L	5782679	Poe PH U2 Upgrade Gen Mgmt Relay Pkg	-	-	-	-	-	-	-	-	101	224	502	
92	2L	5782680	Butt Valley Repl Gen Relay NERC	10	-	-	-	-	-	-	-	-	-	-	
93	2L	5782838	Rock Cr Dam Reface Toe	20	-	-	-	-	-	-	-	-	-	-	
94	2L	5782987	Cresta Replace Log Boom	60	18	278	25	-	-	-	-	-	-	-	
95	2L	5782988	DeSabla LLO Trestle Install Fencing	2	-	-	-	-	-	-	-	-	-	-	
96	2L	5782990	LA Tower Replace Actuators	561	1,670	319	-	-	-	-	-	-	-	-	
97	2L	5782997	PV Mitigate 2.4kV Bus Overstressed Brks	34	45	8	(123)	-	-	-	-	-	-	-	
98	2L	5783001	Spaulding 1 & 2 Install Fence & Platform	0	-	-	-	-	-	-	-	-	-	-	
99	2L	5783124	Helms Install Protective Devices	87	-	-	-	-	-	-	-	-	-	-	
100	2L	5783136	Haas Install Air Monitoring	13	176	157	2	-	-	-	-	-	-	-	
101	2L	5783171	Grizzly Frby Dam Access Improvements	189	950	1,561	1,246	57	-	-	-	-	-	-	
102	2L	5783172	Cresta PH U2 Repl Gen Relay NERC	100	1	-	-	-	-	-	-	-	-	-	
103	2L	5783173	Cresta PH U1 Repl Gen Relay NERC	(5)	-	-	-	-	-	-	-	-	-	-	
104	2L	5783541	Lower Bucks Dam Resurface DS Face	76	56	46	119	165	773	373	12,002	10,711	260	-	
105	2L	5783834	Scott Dam Improve Monitoring Equipment	358	183	3	21	-	-	-	-	-	-	-	
106	2L	5785563	Drum Canal Escape Ladders	622	-	-	-	-	-	-	-	-	-	-	
107	2L	5787761	Pit 7 Dam Install Steel Walkways	10	-	-	-	-	-	-	-	-	-	-	
108	2L	5787968	AM:Caribou 1 PH Replace OhioBrass Insula	-	58	124	-	-	-	-	-	-	-	-	
109	2L	5787969	South PH Replace Ohio Brass Insulator	-	85	135	-	-	-	-	-	-	-	-	
110	2L	5787995	Upp Miocene Canal Remove Damaged Flumes	2,058	0	-	-	-	-	-	-	-	-	-	
111	2L	5788182	AM: DeSabla PH Replace Ohio Brass Insula	211	-	-	-	-	-	-	-	-	-	-	
112	2L	5788183	Hat Creek 2 Replace Ohio Brass Insulator	151	490	-	-	-	-	-	-	-	-	-	
113	2L	5788187	Pit 7 PH U1 Replace Gen Relay	5	0	225	1,586	1	-	-	-	-	-	-	
114	2L	5788188	HC: Cableways Install Hornet Cabinets	-	125	212	147	1,001	738	-	-	-	-	-	
115	2L	5788243	Cresta PH Replace CB 52-24	10	15	(25)	-	-	-	-	-	-	-	-	
116	2L	5788244	Philbrook Res Dam Install Piezo Stair	12	41	105	-	-	-	-	-	-	-	-	
117	2L	5788245	Butt Creek #1 (BR #6) Replace Guardrails	-	46	-	-	-	-	-	-	-	-	-	
118	2L	5788246	Rock Creek PH Turbine Maint Platform	20	48	9	125	751	23	-	-	-	-	-	
119	2L	5788248	DeSabla Res Dam Install Piezo Stairs	9	39	72	-	-	-	-	-	-	-	-	
120	2L	5788250	Poe Dam Install Ped Bridge & Survey Plat	53	73	158	123	1,003	1,971	-	-	-	-	-	
121	2L	5788251	PV Scott Dam Replace & Relocate Catwalk	20	149	962	-	-	-	-	-	-	-	-	
122	2L	5789146	Balch Afterbay Rplc Fall Protection	160	523	79	-	-	-	-	-	-	-	-	
123	2L	5789320	Helms - Replace KI-17 Handrail System	2	(2)	-	-	-	-	-	-	-	-	-	
124	2L	5789325	CVD Repl Gates, Stems, Guides & Actuator	38	162	285	207	230	560	1,686	5,651	-	-	-	

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125	2L	5790058	Deer Creek Flume Liner Install SYC	166	-	-	-	-	-	-	-	-	-	-	-
126	2L	5790158	Drum Install Fencing 2020 (Pub Safety)	515	13	-	-	-	-	-	-	-	-	-	-
127	2L	5791044	South Yuba Wood Box Flume Install Liner	-	564	-	-	-	-	-	-	-	-	-	-
128	2L	5791458	Helms - Replace Kl-27 Walkway	30	179	-	-	-	-	-	-	-	-	-	-
129	2L	5792238	Coleman Siphon 1 Install Manual Access	-	88	75	-	-	-	-	-	-	-	-	-
130	2L	5792576	McCloud Dam/Reservoir Install Fencing	90	33	-	-	-	-	-	-	-	-	-	-
131	2L	5792583	Pit 3 PH Install Wye PTs & Switch	-	-	68	104	94	-	786	95	-	-	-	-
132	2L	5792677	Bucks Creek Replace 11.5kV Aux Cubicles	-	-	9	36	464	-	1,220	335	-	-	-	-
133	2L	5792692	Drum Install Fencing 2021 (Pub Safety)	329	949	(8)	-	-	-	-	-	-	-	-	-
134	2L	5792724	Phoenix PH Replace ISO Meters	-	47	130	23	-	-	-	-	-	-	-	-
135	2L	5792725	Wise 2 PH Replace ISO Meters	-	19	(19)	-	-	-	-	-	-	-	-	-
136	2L	5792726	Alta PH Replace ISO Meters	-	66	21	86	168	-	-	-	-	-	-	-
137	2L	5792728	Halsey PH Replace ISO Meters	-	84	16	63	149	-	-	-	-	-	-	-
138	2L	5792729	Wise 1 PH Replace ISO Meters	-	51	12	101	171	-	-	-	-	-	-	-
139	2L	5792730	Meadow Lake Install Railing Drum	-	20	3	2	83	-	553	40	-	-	-	-
140	2L	5792738	CVD Hoisting Motor Pipe Threading Tool	-	30	139	314	230	-	-	-	-	-	-	-
141	2L	5792743	Helms - Repl Zone 12 Fire Protect Sys	-	10	19	136	54	-	-	234	239	2,253	-	-
142	2L	5792752	McCloud Dam Spillway Inst Video Monitor	-	-	-	13	1	-	-	-	-	-	-	-
143	2L	5792753	Pit 3 Lk Britton Dam Inst Video Monitor	-	-	-	-	14	-	543	-	-	-	-	WP 3-452
144	2L	5792762	Belden PH Install PS Siren	-	-	-	-	18	-	-	-	367	1,664	-	-
145	2L	5792921	Belden Arc Fish Mtgtn Ovrstrd LV Bkrs	-	31	110	27	-	-	-	-	-	-	-	-
146	2L	5793572	Drum Install Fencing 2022 (Pub Safety)	-	-	735	131	-	-	-	-	-	-	-	-
147	2L	5793573	Drum Canal Pubic Safety Impv 2023	-	-	-	1,124	942	245	-	-	-	-	-	-
148	2L	5793591	Wise 1 & 2 PHs - Install Smoke Detection	-	-	-	-	-	-	-	249	505	52	-	
149	2L	5793603	Drum 1 Governor Oil Fire System	-	-	-	-	-	-	-	143	92	468	9	
150	2L	5793608	Fuller Lake Inst Handrail DS by DamCrest	-	-	-	-	-	-	-	-	-	-	141	
151	2L	5793609	Drum Canal Install Foot Bridge at 373+00	-	-	-	-	-	-	-	-	-	-	131	
152	2L	5793610	Drum Canal Install Foot Bridge at 227+50	-	-	-	-	-	-	-	-	-	-	131	
153	2L	5793651	Chili Bar PH-Install 21kV SCADA Recloser	2	17	5	(24)	-	-	-	-	-	-	-	-
154	2L	5793652	Chili Bar PH - Install DTT Receivers	55	(122)	193	(125)	-	-	-	-	-	-	-	-
155	2L	5793653	Toadtown PH - Install DTT Receiver	20	130	68	180	179	43	-	-	-	-	-	-
156	2L	5793654	Desabla PH - Install DTT Receiver	19	40	35	156	110	11	-	-	-	-	-	-
157	2L	5793655	Desabla PH - Install 60kV and 12kV Reven	21	4	(17)	(7)	-	-	-	-	-	-	-	-
158	2L	5793656	Kern PH Install 70kV and 12kV Meters	(35)	39	-	0	-	-	-	-	-	-	-	-
159	2L	5793657	Desabla PH - Install 12kV Transf & Pole	-	5	98	1	-	-	-	-	-	-	-	-
160	2L	5793659	Kern PH Install DTT Receiver	(177)	145	19	13	-	-	-	-	-	-	-	-
161	2L	5793660	Kern PH Install T-line SCADA Switch& TPS	(606)	1,219	(3)	(155)	-	-	-	-	-	-	-	-
162	2L	5793661	Placerville Sub-Install Bank 2 LTC Cont.	13	(43)	0	29	-	-	-	-	-	-	-	-
163	2L	5793662	Chili Bar PH-Install 21kV Meter	0	(20)	-	20	-	-	-	-	-	-	-	-
164	2L	5793663	Toadtown PH-Install 12kV SCADA Recloser	-	0	28	0	-	-	-	-	-	-	-	-
165	2L	5793664	Toadtown PH - Install 12kV Meter	0	4	4	(8)	-	-	-	-	-	-	-	-
166	2L	5795423	Drum Cnl Inst Grab Cable Pub Saf 2021	-	720	64	-	-	-	-	-	-	-	-	-
167	2L	5796899	DeSabla Forebay Install Rip Rap	-	84	1,648	-	-	-	-	-	-	-	-	-
168	2L	5796980	Pit 3 Tailrace Bridge Seismic Upgrade	-	-	-	-	8	-	-	-	-	-	-	-
169	2L	5797722	Caribou 2 PH U5 Upgr Gen Protect Relays	-	-	296	2,424	3,113	-	-	-	-	-	-	-
170	2L	5797780	Coleman Upgr 120/208V Switchgear	-	-	85	159	246	-	32	43	44	1,477	21	
171	2L	5797781	Volta 1 Repl Ohio Brass Insulators SW 61	-	-	90	19	5	-	-	-	-	-	-	-
172	2L	5798264	Bucks Creek PH Replace CTs & ISO Meters	-	61	31	33	54	232	-	-	-	-	-	-
173	2L	5798265	Oak Flat PH Replace CTs & ISO Meters	-	35	28	54	29	-	188	-	-	-	-	-
174	2L	5798453	Lower Drum Cnl Inst Grab Cable 22/23	-	-	281	946	154	-	-	-	-	-	-	-
175	2L	5798520	Bucks Creek PH Repl AC Panels 8, 11 & 12	-	-	51	103	-	-	-	-	-	-	-	-
176	2L	5798523	Caribou 1 Intake Replace Walkway Anchor	-	492	104	2,428	36	-	-	-	-	-	-	-
177	2L	5789158	Tule Area Animal Abatement	22	179	-	-	-	-	-	-	-	-	-	-
178	2L	5790117	Kerckhoff 1 Animal Abatement	19	290	-	-	-	-	-	-	-	-	-	-
179	2L	5797724	SJ 2 Switch Replacement (FRMMA/WMPMA)	-	0	(0)	-	-	-	-	-	-	-	-	-
180	2L	5800231	SPO - ASST MGMT - SJ 2 Switch Rem (WMPMA)	-	-	149	-	-	-	-	-	-	-	-	-
181	2L	5800478	Spaulding 3 PH 60KV Buss Replace - WMPMA	-	-	35	446	(6)	-	-	-	-	-	-	-
182	2L	5800945	Belden PH Repl CB212 230kV CCVT - WMPMA	-	-	196	-	-	-	-	-	-	-	-	-
183	2L	5803138	Spa 3 XFMR Banks Install Seismic Anchors	-	-	-	341	-	-	-	-	-	-	-	-
184	2L	5805038	BV Repl CB162 Operator Mech WMPMA	-	-	-	82	23	115	-	-	-	-	-	-
185	2L	5806105	EGI Tags to Cap Projects	-	-	-	-	549	500	155	-	-	-	-	-
186	2L	5800659	PV CapeHorn Fish Hotel Repl Aux Gate DOE	-	-	10	421	-	-	-	-	-	-	-	-

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187	2L	5800747	Pit 1 PH Ctrl & AVR Rm Rebuild Non-Comb	-	-	-	26	411	-	1,915	36	-	-	-	
188	2L	5800778	Balch 2 – Arc Flash Mitigation of Overst	-	-	26	84	90	-	181	3,605	500	-	-	
189	2L	5801960	JBB PH Install Smoke Detection	-	-	-	-	18	-	-	-	275	520	-	
190	2L	5801961	Pit 5 PH Install Smoke Detection	-	-	-	-	13	-	-	-	275	520	-	
191	2L	5801963	Pit 6 PH Install Smoke Detection	-	-	-	-	12	-	-	-	275	520	-	
192	2L	5801964	Pit 3 PH Install Smoke Detection	-	-	-	-	26	-	-	-	275	520	-	
193	2L	5801965	JBB PH Replace Gen CO2 Fire System	-	-	-	-	18	-	-	-	367	1,664	-	
194	2L	5802281	Helms – Replace Gen CO2 Fire System	-	-	-	43	2,796	586	-	-	-	-	-	
195	2L	5802598	Pit 3 Britton Dam Install EAP PROC Alarm	-	-	-	-	105	-	645	-	-	-	-	WP 3-463
196	2L	5802626	Tiger Creek PH Install Smoke Detection	-	-	-	44	172	-	-	-	-	-	-	
197	2L	5802627	Stanislaus PH Install Smoke Detection	-	-	-	-	12	-	-	-	342	853	33	
198	2L	5802829	Wishon Dam Install Seismic Monitoring	-	-	-	1	-	-	-	21	-	-	-	WP 3-463
199	2L	5802830	Courtright Dam Seismic Monitoring	-	-	-	0	-	-	-	119	-	-	-	
200	2L	5802880	PV E2 Cableway Replace Main Cable	-	-	-	2	79	-	-	-	-	-	-	
201	2L	5802881	Caribou 2 PH Install Smoke Detection	-	-	-	-	53	-	195	49	689	-	-	
202	2L	5802882	Caribou 1 PH Install Smoke Detection	-	-	-	2	59	-	196	150	696	-	-	
203	2L	5803542	Pit 5 PH Transformer Access Improvement	-	-	-	991	(1)	-	-	-	-	-	-	
204	2L	5804258	Pit 4 PH Install Stop Log Gate Hoists	-	-	-	-	9	-	-	-	873	2,104	144	
205	2L	5804352	Deer Creek EMS Visibilty	-	-	-	23	39	-	-	-	-	-	-	
206	2L	5804463	Toadtown 12kV switch GEN/3	-	-	-	6	212	-	-	-	-	-	-	
207	2L	5805244	Pit 5 Tranxfmers Install Seismic Bracing	-	-	-	-	8	-	-	-	1,347	-	-	
208	2L	5805663	PV Cape Horn Seepage Install Curb/Gutter	-	-	-	-	-	-	-	190	367	-	-	
209	2L	5805819	Kerckhoff 1 Inst New Gage SJR Pub Safet	-	-	-	-	46	305	148	1,993	64	-	-	
210	2L	5805973	Pit 3 PH Arc Flash Mitigation	-	-	-	-	-	-	-	0	138	399	919	
211	2L	5806381	Mountain Meadow Reservoir Inst RTU EWS	-	-	-	-	39	1	0	238	459	-	-	
212	2L	5806383	Bucks Creek Three Lakes Dam Inst RTU EWS	-	-	-	-	42	-	-	-	-	-	-	
213	2L	5806449	Upper Rock Dam Install Fall Protection	-	-	-	-	16	-	-	-	-	-	-	
214	2L	5807779	Salt Springs Dam Inst Siren EWS	-	-	-	-	-	-	-	143	138	624	94	
215	2L	5807780	Drum Forebay Dam Inst Siren EWS	-	-	-	-	-	-	-	-	-	-	141	
216	2L	5807781	Fuller Lake Dam Inst RTU EWS	-	-	-	-	35	-	-	-	-	-	-	
217	2L	5807783	Wise Forebay Dam Inst Siren EWS	-	-	-	-	25	-	-	143	550	104	-	
218	2L	5807784	Upper Bear River Dam Inst Siren EWS	-	-	-	-	-	-	-	-	-	-	141	
219	2L	5807785	Tiger Creek Regulator Dam Inst Siren EWS	-	-	-	-	-	-	-	-	-	-	141	
220	2L	5807788	Lake Spaulding No 1 Dam Inst Siren EWS	-	-	-	-	-	-	-	-	138	156	562	
221	2L	5807789	Lake Valley Dam Inst Siren EWS	-	-	-	-	-	-	116	571	92	-	-	
222	2L	5807808	Halsey Afterbay Dam Inst Siren EWS	-	-	-	-	-	-	-	143	138	624	94	
223	2L	5807817	Scott Dam Inst Siren EWS	-	-	-	-	59	-	78	571	92	-	-	
224	2L	5807826	Pit 1 Forebay Dam Inst Siren EWS	-	-	-	-	28	-	-	-	-	-	141	
225	2L	5807832	Courtright Dam Inst Siren EWS	-	-	-	-	73	-	466	95	-	-	-	
226	2L	5808116	Rock Creek Dam Recoat Radial BP Gate GIR	-	-	-	-	-	-	-	-	-	104	843	
227	2L	5808117	Lower Bear Dam Recoat Radial Gate GIR	-	-	-	-	-	-	-	-	-	520	-	
228	2L	5808199	Cresta Dam BP Gate Repl Seals Recoat GIR	-	-	-	-	18	-	699	-	-	-	-	
229	2L	5808200	Belden Dam Recoat Radial Gates GIR	-	-	-	-	-	-	-	-	-	-	187	
230	2L	5808204	Pit 1 Dam Recoat Radial Gate 5 GIR	-	-	-	-	-	-	-	190	275	1,664	19	
231	2L	5808205	Pit 6 Dam Recoat Radial Gate GIR	-	-	-	-	-	-	-	-	138	988	890	
232	2L	5808206	Pit 7 Dam Recoat Radial Gates GIR	-	-	-	-	8	-	-	-	-	104	278	WP 3-381
233	2L	5808220	Balch 1 - PH Install Smoke Detection	-	-	-	-	-	-	-	-	229	312	1,537	
234	2L	5808221	Balch 2 - PH Install Smoke Detection	-	-	-	-	-	-	-	-	229	312	1,537	
235	2L	5808662	Lower Drum Cnl Inst Grab Cable 24/25	-	-	-	-	316	1,258	49	-	-	-	-	
236	2L	5808899	Balch Intake Bridge KC19 Deck Replace	-	-	-	-	-	100	-	-	-	-	-	
237	2L	5809418	Helms Siemens ENS-PA Updates	-	-	-	-	130	-	-	-	-	-	-	
238	2L	5809573	JBB ICD Vertical Access Shaft Improvemen	-	-	-	-	-	-	194	48	-	-	-	
239	2L	5810107	Fordyce Dam Install Plinth	-	-	-	-	8,279	40,522	-	-	-	-	-	
240	2L	5810108	Fordyce Dam Install Carpi Liner	-	-	-	-	4,008	-	21,099	-	-	-	-	
241	2L	5810379	San Joaquin 3 Mitigate Ground Grid	-	-	-	-	-	-	-	119	459	780	2,343	
242	2L	5810779	Drum Cnl Inst Grab Cable 26/27	-	-	-	-	-	-	-	-	-	520	28	
243	2L	5810945	Volta 1 Replace ISO Meters	-	-	-	-	42	-	-	-	-	-	-	
244	2L	5810946	Volta 2 Replace ISO Meters	-	-	-	-	47	-	-	-	-	-	-	
245	2L	5810947	South PH Replace ISO Meters	-	-	-	-	41	-	-	-	-	-	-	
246	2L	5811968	Pit 5 Penstock Geotechnical Hardening	-	-	-	-	-	-	-	-	138	3,121	-	
247	2L	5812033	Halsey PH Replace PSV	-	-	-	-	-	-	116	285	367	26	-	
248	2L	5812287	Caribou 1 Intake Seismic Improvements	-	-	-	-	-	-	-	95	138	520	5,623	

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249	2L	5812323	DeSabla Frby Fishing Platform Inst Ret W	-	-	-	-	-	-	-	-	-	-	9	
250	2L	5812334	Rock Creek PH Install Gen CO2 Fire Syste	-	-	-	-	-	-	-	114	356	1,649	-	
251	2L	5813278	Phoenix PH Replace GSU Fault Proctection	-	-	-	-	0	-	-	-	-	-	-	
252	**2L**	**2L Total**		**29,592**	**27,219**	**27,606**	**25,396**	**70,347**	**70,247**	**46,075**	**55,202**	**55,682**	**57,052**	**31,764**	Sum of Lines 29-251
253	**2L**														
254	2M	5500325	Shasta Inst/Repl Hydro Generating Equip	195	361	411	1,178	200	900	769	1,036	1,099	1,371	1,358	
255	2M	5500326	DeSabla Emergent Capital Work	2	-	-	-	-	-	-	-	-	-	-	
256	2M	5500327	Drum Inst/Repl Hydro Generating Equip	121	91	167	381	241	900	769	1,036	1,099	1,371	1,358	
257	2M	5500328	MLode Inst/Repl Hydro Generating Equip	564	85	395	97	759	900	769	1,036	1,099	1,371	1,358	
258	2M	5501133	DeSabla Repl Obsol/Deteriorated Eqpt/Fac	1,873	1,567	656	(9)	1,860	900	769	1,036	1,099	1,371	1,358	
259	2M	5502519	KCV Replace Obsolete/Deteriorated Eqpt	568	1,430	153	157	513	900	769	1,057	1,099	1,371	1,358	
260	2M	5502521	Helms Repl Obsolete/Deteriorated Eqpt	314	735	436	119	509	900	769	1,036	1,099	1,371	1,358	
261	2M	5716763	Drum Projects MWC 81	-	-	-	(12)	-	-	-	-	-	-	-	
262	2M	5720513	Salt Springs 1 Rewind Generator	(494)	17	10	12	9	-	-	-	67	1,682	5,657	
263	2M	5720528	Electra U2 Rewind Generator	4,095	4,034	215	13	-	-	-	-	-	-	-	
264	2M	5720539	Spring Gap Repl Gen Relays	2	-	-	-	-	-	-	-	-	-	-	
265	2M	5720655	Pit 7 U2 Rewind	7,494	42	12	20	-	-	-	-	-	-	-	
266	2M	5720656	Caribou 1 PH Rewind U1	922	3,989	5,038	1,376	71	-	-	-	-	-	-	
267	2M	5720657	Caribou 1 PH Rewind U2	142	834	221	91	96	-	817	9,244	459	-	-	
268	2M	5720658	Caribou 1 U1 Repl Gen. Breaker	36	80	-	1	0	-	-	-	-	-	-	
269	2M	5720659	Caribou 2-5 Rewind	939	2,206	341	4,856	15,527	2,502	-	-	-	-	-	
270	2M	5720663	Cresta U2 Replace Wickets & FPs	42	883	558	738	-	-	-	-	-	-	-	
271	2M	5720670	Rock Cr Refurb GSU Spare Bank	-	329	356	-	-	-	-	-	-	-	-	
272	2M	5720682	Pit 3 Unit 3 Rewind Generator	(34)	76	-	-	-	-	-	-	-	-	-	
273	2M	5720696	Pit 4 PH U1 Upgr Runner WG & Seal Rings	-	-	-	-	-	-	-	-	229	580	2,062	WP 3-340
274	2M	5720716	Pit 7 U1 Replace Runner	-	-	-	-	-	-	-	143	275	1,248	7,685	
275	2M	5720717	Pit 7 U2 Replace Runner	-	-	-	-	-	-	-	-	138	312	1,125	
276	2M	5720719	Pit 6 PH U1 Upgrade Turbine	-	-	-	29	99	-	-	659	564	4,388	7,781	
277	2M	5720720	Pit 6 PH U2 Upgrade Turbine	-	-	-	32	100	-	179	3,793	564	4,388	7,781	
278	2M	5720725	Caribou 1 U1 Repl Runners-Bearings-Shaft	5,116	8,740	7,973	558	183	-	-	-	-	-	-	
279	2M	5720726	Caribou 1 U2 Repl Runners-Bearing-Shaft	1,195	1,182	354	312	499	4,234	3,865	13,329	3,874	-	-	
280	2M	5720727	Caribou 1 U3 Repl Rnnr, Brng, Shft & Ndl	-	-	-	-	-	-	-	95	1,147	5,201	7,029	
281	2M	5720747	Pit 4 U1 Rewind Generator Stator	-	-	-	-	-	-	-	143	1,376	5,721	5,389	
282	2M	5720881	AGWishon U4 Rewind Generator	-	-	-	-	-	-	-	-	-	-	141	
283	2M	5728982	Kings River PH - Replace Governor	33	-	-	-	-	-	-	-	-	-	-	
284	2M	5728990	Helms - Install Liquid Rheostat Backup	60	98	0	4	2	-	-	-	-	-	-	
285	2M	5734298	Caribou 1 PH Upg U2 Governor Controls	11	12	11	12	59	-	1,009	3,595	734	-	-	
286	2M	5734402	AG Wishon - Install Static Excitation	10	(130)	-	-	-	-	-	-	-	-	-	
287	2M	5735379	Cresta Refurbish Transformer Banks	0	-	-	-	-	-	-	-	-	-	-	
288	2M	5739258	AGWishon - Replace Load Controller	6	(80)	-	-	-	-	-	-	-	-	-	
289	2M	5739698	Balch 1 - Replace Governor	167	24	22	95	293	-	347	572	2,081	683	-	
290	2M	5739712	SJ3 - Repl TSV	3	(40)	-	-	-	-	-	-	-	-	-	
291	2M	5739725	Haas Replace Gen CO2 Fire System	19	15	1,008	734	37	-	-	-	-	-	-	
292	2M	5745664	Caribou 1 U2 Replace Needles & Seats	(0)	-	-	-	-	-	-	-	-	-	-	
293	2M	5745673	DeSabla Replace AVR	0	-	-	-	-	-	-	-	-	-	-	
294	2M	5745677	Electra U3 New Needle, stem & Bushings	11	-	-	-	-	-	-	-	-	-	-	
295	2M	5745710	Poe U2 Governor Upgrade Controls	1,862	-	-	-	-	-	-	-	-	-	-	
296	2M	5745715	Salt Springs 2 Repl Runner,Needles,Seats	-	-	-	-	-	-	233	951	2,723	256	-	
297	2M	5745722	Tiger Creek FB Install Backup Generator	0	-	-	-	-	-	-	-	-	-	-	
298	2M	5745724	Tiger Creek U2 Gov Control Upgrades	64	629	2,483	-	-	-	-	-	-	-	-	
299	2M	5747177	Bucks Cr PH Repl U2 Turb Brg / Shaft	4,518	9,037	1,113	390	5,256	-	-	-	-	-	-	
300	2M	5747184	Butt Valley Replace Exciter	53	1	-	-	-	-	-	-	-	-	-	
301	2M	5747208	DeSabla Rewind Generator	-	-	-	-	-	-	-	119	2,752	3,121	4,686	
302	2M	5747215	Drum Unit 1 Rewind	-	-	-	-	-	-	-	-	-	-	281	
303	2M	5747216	Drum Unit 3 Rewind	-	-	-	-	-	-	-	-	-	-	281	
304	2M	5747243	Helms - Replace Load Center 1,2,7,&8	-	116	1,069	-	-	-	-	-	-	-	-	
305	2M	5747252	K2 - Repl Gen NERC/Xfmr Mgmt Relays	538	2,142	-	-	-	-	-	-	-	-	-	
306	2M	5747260	Kings River - Repl Exciter	212	-	-	-	-	-	-	-	-	-	-	
307	2M	5747276	Pit 5 Repl Tranxfmr B1ABC & B2ABCSP	36	51	71	519	-	-	-	-	-	-	-	
308	2M	5754691	AG Wishon - Repl Cooling Water Regulator	6	6	6	7	89	-	-	-	-	-	-	
309	2M	5754693	Kings River - Intake Diff Scheme Mod	2	-	-	-	-	-	-	-	-	-	-	
310	2M	5754717	Spaulding 2 Gov HPU and Control Upgrade	4	-	-	-	-	-	-	-	-	-	-	

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311	2M	5755571	Kerckhoff 1 - Retire Unit 2		(57)	-	-	-	-	-	-	-	-	-	-
312	2M	5756604	Caribou1 Repl Cooling Water Supply		(4)	-	-	-	-	-	-	-	-	-	-
313	2M	5758051	Haas - U1 Replace Governor		9	-	-	-	-	-	-	-	-	-	-
314	2M	5758055	AGWishon - U3 Repl Gen Bearings		11	11	12	13	7	-	-	-	-	-	-
315	2M	5758119	Balch 2 - U2 Repl Cooling Water Piping		352	33	-	82	297	1,455	155	998	-	-	-
316	2M	5758121	Haas - U1 Replace Cooling Water Flow Dev		4	-	-	-	-	-	-	-	-	-	-
317	2M	5758136	Helms - Switchyard Emerg Access/Elevator		114	1,424	172	1,155	2,435	-	-	-	-	-	-
318	2M	5759145	Kerckhoff 2 - Kerckhoff 2 – Overhaul Wic		-	-	15	68	155	-	-	-	309	376	2,183
319	2M	5760010	Pit 3 Replace Neutral Transformers		28	26	35	140	166	233	585	62	-	-	-
320	2M	5760011	Pit 3 Powerhouse Replace AC/DC Panel		22	22	242	47	97	253	2,270	1,930	-	-	-
321	2M	5760026	Kerckhoff 2 - Repl SER & Annunciator		(0)	-	-	-	-	-	-	-	-	-	-
322	2M	5760038	Bucks Creek U2 Rewind Generator		3,818	4,344	436	698	4,505	-	-	-	-	-	-
323	2M	5760154	Spaulding 1 TSV Refurbishment		33	12	8	9	14	-	449	728	3,929	204	-
324	2M	5760167	Cresta PH Replace U1 Exciter		11	7	5	6	138	808	1,453	2,794	306	46	-
325	2M	5760617	Balch 2 U3 Replace Cooling Water Piping		420	24	-	106	643	2,016	910	-	-	-	-
326	2M	5760627	Bucks U1 TSV Refurbish		883	144	-	-	-	-	-	-	-	-	-
327	2M	5760630	Caribou 1 Refurb PSV Aux Equip		(3)	-	-	-	-	-	-	-	-	-	75
328	2M	5760632	Caribou 1 U2 Repl Gen Breaker		31	18	81	22	104	-	-	-	-	-	-
329	2M	5760633	Caribou 1 U3 Repl Gen Breaker		14	10	100	33	107	-	-	-	-	-	-
330	2M	5760648	Crane Valley - Runner Replacement		-	-	-	-	-	-	-	-	-	-	141
331	2M	5760650	Cresta PH Crane Upgrade		187	515	224	182	161	-	3,512	6,176	-	-	-
332	2M	5760651	Cresta U1 PRV Replace Energy Dissipaters		72	56	17	14	8	-	400	10	950	520	-
333	2M	5760652	Cresta PH Replace U2 Exciter		25	55	23	25	101	844	1,506	3,003	340	414	49
334	2M	5760654	Cresta U2 PRV Replace Energy Dissipaters		19	76	423	1,624	40	-	-	-	-	-	-
335	2M	5760655	Cresta U1 Replace Wicket Gates & FPs		97	42	-	(500)	-	-	-	-	-	-	281
336	2M	5760662	Drum 1 U2 Rewind		-	-	-	-	-	-	-	-	-	-	-
337	2M	5760667	Drum U1-4 Separate Governor HPU		14	-	-	-	-	-	-	-	-	-	-
338	2M	5760669	Drum 2 U5 Rewind		48	8	8	8	4	-	1,165	7,703	2,294	-	-
339	2M	5760680	Electra U1 Governors and Servos Refurb		-	-	-	-	-	-	-	190	183	1,664	94
340	2M	5760681	Electra U2 Governors and Servos Refurb		-	-	-	-	-	-	-	-	183	208	1,499
341	2M	5760684	Halsey Replace Exciter		12	11	13	68	463	-	42	-	-	-	-
342	2M	5760705	Pit 1 Unit 1 Rewind Generator		6,411	8,513	3,815	40	-	-	-	-	-	-	-
343	2M	5760721	Rock Cr VH Upg Aux Equipment		(7)	-	-	-	-	-	194	951	459	-	-
344	2M	5760722	Salt Springs 2 Repl Accum & PSV cntrls		-	-	-	-	-	-	233	476	3,011	256	-
345	2M	5760736	Spaulding 3 Switchgear Replacement		387	2,305	(9)	-	-	-	-	-	-	-	-
346	2M	5760744	Tule 2.3kV Gen Switchgear		27	(364)	-	-	-	-	-	-	-	-	-
347	2M	5761119	Pit 1 U2 Upgrade Generator Relays		142	295	153	140	356	-	-	2,054	-	-	-
348	2M	5761242	Butt Valley Repl Wicket Shims		(1)	-	-	-	-	-	-	-	-	-	-
349	2M	5762318	Pit 4 U1 Replace Excitation System		-	-	-	-	-	-	-	-	138	798	1,046
350	2M	5762319	Pit 4 U2 Replace Excitation System		-	-	-	-	-	-	-	-	-	52	328
351	2M	5762320	Pit 5 U1 Replace Excitation System		30	28	31	413	864	820	1,073	-	-	-	-
352	2M	5762321	Pit 5 U2 Replace Excitation System		-	-	-	-	-	-	-	48	289	719	1,469
353	2M	5762322	Pit 5 U3 Replace Excitation System		-	-	-	-	-	-	-	-	46	354	712
354	2M	5762323	Pit 5 U4 Replace Excitation System		-	-	-	-	-	-	-	-	-	52	328
355	2M	5762324	Pit 3 PH U2 Upgr Runner WG & Seal Rings		-	-	82	308	1,072	-	168	5,970	3,561	3,113	106
356	2M	5762325	Pit 3 PH U1 Upgr Runner WG & Seal Rings		-	-	-	-	16	-	-	-	-	-	-
357	2M	5762326	Pit 3 PH U3 Upgr Runner WG & Seal Rings		-	-	-	-	-	-	-	-	183	520	1,125
358	2M	5762329	Kerckhoff 2 - Generator Rewind/Restack		-	-	-	-	-	-	-	-	459	2,080	4,686
359	2M	5764558	Pit 5 Autom Gen Brg Oil Filtration & Htg		33	29	86	757	1,578	-	-	-	-	-	-
360	2M	5765039	Balch 2 - U3 Repl TSV Actuator Seal		9	8	10	10	5	-	-	-	112	531	60
361	2M	5765118	Drum PS3 Intake Gate Replacement		495	441	178	1,381	(11)	-	-	-	-	-	-
362	2M	5765358	Helms - Install Liquid Rheostat Platform		-	-	-	-	-	-	-	-	-	104	234
363	2M	5766152	Pit 4 Replace Generator Air Breakers		96	78	275	1,668	2,013	5,806	-	-	-	-	-
364	2M	5766153	Pit 5 TGB Install Inline Oil Filtration		200	16	-	206	1,561	-	-	-	-	-	-
365	2M	5766154	JBB PH U1 Upgrade Governor Controls		-	36	155	593	1,069	-	6,873	71	-	-	-
366	2M	5766241	Tiger Creek U2 Exciter Replacement		21	11	19	319	350	2,138	422	-	-	-	-
367	2M	5766242	Drum U5 Install RTD		10	5	5	4	2	-	82	576	828	-	-
368	2M	5766243	Tiger Creek U2 Repl Generator Relays		22	11	9	15	219	-	127	1,289	-	-	-
369	2M	5766244	Drum U5 Cooling Water Flow meters		8	4	4	4	2	-	81	381	550	-	-
370	2M	5766253	Bucks Creek U1 Generator Stator Rewind	6,429	4,854	38	66	6	-	-	-	-	-	-	-
371	2M	5766254	Caribou 1 PH Repl Standby Generator	4	-	-	-	-	-	-	-	-	-	-	-
372	2M	5766379	Helms - Wishon 120in Vlv Cont Sys Replc	(161)	-	-	-	-	-	-	-	-	-	-	-

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373	2M	5766380	Helms - Replace Air Compressors	1	-	-	-	-	-	-	-	-	-	-	
374	2M	5766394	Kern - Replace Turbine Platform	(1)	-	-	-	-	-	-	-	-	-	-	
375	2M	5766531	Drum Replace Siphon No2 Drain	1	-	-	-	-	-	-	-	-	-	-	
376	2M	5767080	Halsey PH - Replace Runner and Wicket	1,963	787	4,590	2,721	3,949	-	-	-	-	-	-	
377	2M	5767539	Tiger Creek U1 Gov Control Upgrades	2,233	35	-	-	-	-	-	-	-	-	-	
378	2M	5767980	Caribou 1 U1 Upgrade Gov Controls	185	1,192	2,710	172	31	-	-	-	-	-	-	
379	2M	5767981	Caribou 1 U3 Upgrade Gov Controls	1	2	2	2	6	-	-	239	1,376	3,121	-	
380	2M	5767986	Dutch Flat 1 Replace 480V Switchgear	0	-	-	-	-	-	-	-	-	-	-	
381	2M	5767992	Helms Improve Facility Portal Security	-	-	-	-	99	-	421	-	-	-	-	
382	2M	5767993	Helms - Rewind U2	9,603	6	-	121	-	-	-	-	-	-	-	
383	2M	5768002	JBB PH U2 Upgrade Governor Controls	-	-	-	140	663	7,625	116	-	-	-	-	
384	2M	5768011	Poe Unit 1 Excitation System Replacement	-	-	310	588	2,254	-	-	-	-	-	-	
385	2M	5768012	Poe Unit 2 Excitation System Replacement	-	-	279	553	1,810	2,048	-	-	-	-	-	
386	2M	5768020	Volta 1 Inst Station Service Disconnect	2	2	2	3	1	-	-	-	80	106	452	
387	2M	5768238	Drum Canal Pittman Flume Structural Impr	-	-	-	6	157	276	324	867	-	-	-	
388	2M	5770609	Kings River - Replace PRV Seat	0	(0)	-	-	-	-	-	-	-	-	-	
389	2M	5771320	Pit 6 Replace Gov Pump Echelon Controls	113	-	-	-	-	-	-	-	-	-	-	
390	2M	5772018	Haas - Replace U1 Bearings/Install RTDs	135	113	407	1,792	12	-	-	-	-	-	-	
391	2M	5772059	Belden PH Repl Cooling Water Pumps	3	-	-	-	-	-	-	-	-	-	-	
392	2M	5772341	K1 - Replace U1 Generator Leads	3	(43)	-	-	-	-	-	-	-	-	-	
393	2M	5772342	K1 - Replace U3 Generator Leads	1	(9)	-	-	-	-	-	-	-	-	-	
394	2M	5772629	Helms U3 - Replace SW293	0	(2)	-	-	-	-	-	-	-	-	-	
395	2M	5772632	K2 - Crane Radial Controls	77	230	31	-	-	-	-	-	-	-	-	
396	2M	5772633	Kings River PH - Replace CB132	4	-	-	-	-	-	-	-	-	-	-	
397	2M	5772634	K2 - Replace Turbine Deck Switchgear	72	-	-	-	-	-	-	-	-	-	-	
398	2M	5772636	SJ2 -Replace Load/Excess Flow Controller	0	(6)	-	-	-	-	-	-	-	-	-	
399	2M	5772637	SJ3 -Replace Load/Excess Flow Controller	1	(7)	-	-	-	-	-	-	-	-	-	
400	2M	5773183	Stanislaus Replace Generator Relays	174	1,272	-	-	-	-	-	-	-	-	-	
401	2M	5773877	Stanislaus PH Repl CW Flowmeters	20	-	-	-	-	-	-	-	-	-	-	
402	2M	5774081	AG Wishon - U3 Install Gen RTDs	8	8	9	9	16	-	-	95	138	832	-	
403	2M	5774227	Pit 5 PH Cap Restoration 17 storm damage	(2,351)	(1,781)	-	-	-	-	-	-	-	-	-	
404	2M	5775222	Haas - Replace U2 Bearings/Install RTDs	131	679	1,609	-	-	-	-	-	-	-	-	
405	2M	5775223	Haas - Replace Distribution Panelboards	29	-	-	-	-	-	-	-	-	-	-	
406	2M	5775299	Tule - U2 Install Thrust Bearing	5	(61)	-	-	-	-	-	-	-	-	-	
407	2M	5775438	Pit 1 U1 Upgrade Generator Relays	185	1,484	1,087	66	-	-	-	-	-	-	-	
408	2M	5777269	Pit 6 U1 Replace Main Bank Transformer	3,497	144	-	-	-	-	-	-	-	-	-	
409	2M	5777365	Pit 5 Replace Gov Pump Echelon Controls	0	-	-	-	-	-	-	-	-	-	-	
410	2M	5777366	Hat Creek 1 Replace Transformer Bk-1-ABC	-	15	154	532	749	-	57	-	-	-	-	
411	2M	5777373	JBB U1 Replace CT, PT, SA & Bus Duct	-	-	-	-	17	-	1,965	120	-	-	-	
412	2M	5778043	Helms - U1 Repl TSV	254	229	(395)	1,748	3,788	5,943	3,353	2,774	13,156	1,857	-	
413	2M	5778044	Helms - U2 Repl TSV	326	220	247	1,802	3,285	3,694	5,642	2,854	13,242	1,876	-	
414	2M	5778045	Helms - U3 Repl TSV	240	251	230	1,880	5,643	4,713	18,268	3,464	-	-	-	
415	2M	5778049	Kings River - Rpl TSV Cntrl Wtr Strnrs	12	-	-	-	-	-	-	-	-	-	-	
416	2M	5778054	Spring Gap PH - Generator Rewind	79	118	21	22	18	-	56	1,814	4,628	180	65	
417	2M	5778056	Dutch Flat 1 Cooling Water Upgrade	67	-	-	-	-	-	-	-	-	-	-	
418	2M	5778058	Spring Gap PH - Replace Air Washer	133	398	17	-	-	-	-	-	-	-	-	
419	2M	5778061	Tiger Creek AB Replace Backup Generator	45	-	-	-	-	-	-	-	-	-	-	
420	2M	5778062	Electra PH-Replace Bus Protection Relays	46	-	-	-	-	-	-	-	-	-	-	
421	2M	5778071	Phoenix PH Install Gen Vault Water Pump	54	25	-	-	-	-	-	-	-	-	-	
422	2M	5778073	Drum 1 PH U1-U4 Replace Gen Bkrs	424	0	4	-	-	-	-	-	-	-	-	
423	2M	5778158	Kerckhoff 1 - InstlBackfeed Station Svc	4	4	4	75	245	1,144	-	-	-	-	-	
424	2M	5778161	Kerckhoff Dam - Upgrd Radial Gate Cntrls	18	-	-	-	-	-	-	-	-	-	-	
425	2M	5778219	Butt Valley PH Refurbish PRV	2	-	-	-	-	-	-	-	-	-	-	
426	2M	5778266	Cresta Tunnel Refurbish Liner	2	2	2	(32)	-	-	-	-	-	-	-	
427	2M	5778267	Butt Valley PH Standby Generator	24	-	-	-	-	-	-	-	-	-	-	
428	2M	5778269	Rock Cr PH U2 Repl TSV Seal and Bushings	77	-	-	-	-	-	-	-	-	-	-	
429	2M	5778441	Helms Replace 230kV Oil-Filled Cables	7	7	(98)	-	-	-	-	-	-	-	-	
430	2M	5778900	Tiger Creek U2 Rewind	153	136	142	194	204	-	1,738	4,384	-	-	-	
431	2M	5778920	Electra U2 Convert to Digital Governor	-	-	-	-	-	-	-	71	367	520	937	
432	2M	5778921	Electra U3 Convert to Digital Governor	-	-	-	-	-	-	-	-	321	520	1,687	
433	2M	5778922	Electra U1 Convert to Digital Governor	-	-	-	-	-	-	58	381	459	1,040	469	
434	2M	5778970	Pit 6 U1 Inst New Bus With Gen Breaker	1	1	(12)	-	-	-	-	-	-	-	-	

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435	2M	5778971	Pit 7 U1 Inst New Bus With Gen Breaker	1	0	(5)	-	-	-	-	-	-	-	-	
436	2M	5778972	Pit 6 U2 Replace Transformer	3,018	53	13	-	-	-	-	-	-	-	-	
437	2M	5778973	Pit 7 Replace Transformer Bank 1	55	544	3,481	3,303	9	-	-	-	-	-	-	
438	2M	5778974	Pit 7 PH U2 Replace Transformer	33	507	5,582	52	53	-	-	-	-	-	-	
439	2M	5778975	JBB PH U1 Replace Transformer	4	6	525	1,418	8,866	282	-	-	-	-	-	
440	2M	5778976	JBB PH U2 Replace Transformer	5	2	1	1,593	434	8,097	233	-	-	-	-	
441	2M	5778997	Drum 5 Station Service Switchgear Replc	243	1,817	140	(13)	-	-	-	-	-	-	-	
442	2M	5779178	Newcastle TSV Refurbish Seal	-	-	-	-	19	-	-	-	-	-	-	
443	2M	5779202	Helms - Tunnel Instrumentation Upgrade	170	185	184	1,164	224	-	-	-	-	-	-	
444	2M	5779210	Kerckhoff 2 - Replace TSV Seal	121	1,547	-	-	-	-	-	-	-	-	-	
445	2M	5779211	Kerckhoff 2 - Refursbish TSV Servo	132	2,115	-	-	-	-	-	-	-	-	-	
446	2M	5779215	Hat Creek 2 Replace Transformer Bk-1-ABC	1,088	5,383	40	-	-	-	-	-	-	-	-	
447	2M	5779220	Phoenix PH Replace Transfr Contain Basin	(5)	-	-	-	-	-	-	-	-	-	-	
448	2M	5779221	Phoenix PH 17kV Bus Replace PTs	1	-	-	-	-	-	-	-	-	-	-	
449	2M	5779418	Balch 1 - Replace PSV	68	304	718	514	858	-	1,633	3,783	1,390	-	-	
450	2M	5779420	Balch 1 Wheel Pit Liner	15	56	58	9	67	-	-	17	471	97	-	
451	2M	5779423	Belden PH Refurbish TSV	117	494	666	460	3,773	3,643	-	-	-	-	-	
452	2M	5779424	Bucks Cr PH Repl U1 Bearings and Shaft	-	-	-	-	-	-	-	-	138	1,560	2,343	
453	2M	5779427	Cresta Tunnel Instal Sluice Vlv Operator	1	1	(12)	-	-	-	-	-	-	-	-	
454	2M	5779428	Cresta VH Refurb Sluice Valve	21	2	3	3	3	-	-	-	279	208	-	
455	2M	5779429	Haas U1 Communic/Annunc+Device43 Swtchs	120	60	449	787	4	-	-	-	-	-	-	
456	2M	5779430	Haas U1 Replace TSV Cntrl Wtr Strainers	28	264	96	-	-	-	-	-	-	-	-	
457	2M	5779431	Haas U1 Replace TSV Seats	-	-	-	-	-	-	194	381	92	-	-	
458	2M	5779432	Haas U2 Communic/Annunc+Device43 Swtchs	84	897	656	-	-	-	-	-	-	-	-	
459	2M	5779433	Haas U2 Replace TSV Cntrl Wtr Strainers	4	167	123	-	-	-	-	-	-	-	-	
460	2M	5779434	Haas U2 Replace TSV Seats	14	1	1	1	1	-	119	1,660	427	-	-	
461	2M	5779441	Helms U3 Rotor Demo	-	-	7	(7)	-	-	-	-	-	-	-	
462	2M	5779443	K2 - Replace Governor	-	-	-	-	0	-	108	115	481	-	-	
463	2M	5779444	K2 Replace Turbine Runner	-	-	-	-	-	-	-	-	-	130	2,811	WP 3-287
464	2M	5779447	Kings River Install Turbine SW Strainer	7	-	-	-	-	-	-	-	-	-	-	
465	2M	5779464	Poe U1 & U2 Repl TSV Cylinders	-	-	-	-	-	-	-	-	183	208	469	
466	2M	5779473	Toadtown PH Replace Stoplog Operator	-	-	-	-	-	-	-	-	-	-	94	
467	2M	5779526	Poe PH Trxfmr Repl Bank 1	-	-	19	213	189	-	910	1,129	1,674	1,872	-	
468	2M	5779527	Poe PH Refurb U2 PRV	-	-	-	-	-	-	-	190	459	1,040	1,593	
469	2M	5779573	Stanislaus Replace TWD #2	626	1,485	618	0	-	-	-	-	-	-	-	
470	2M	5779611	Salt Springs U1 Pentock bypass pipe repl	-	-	-	133	16	-	-	-	-	-	-	
471	2M	5779613	Halsey Reinsulate Field Poles	-	1	665	113	234	-	-	-	-	-	-	
472	2M	5780478	Pit 1 Valvehouse Replace 480V Circuit	38	-	-	-	-	-	-	-	-	-	-	
473	2M	5780482	SCADA 2019 RTU Life Cycle Replacement	31	-	-	-	-	-	-	-	-	-	-	
474	2M	5780483	SCADA 2020 RTU Life Cycle Replacement	633	0	-	-	-	-	-	-	-	-	-	
475	2M	5780484	SCADA 2021 RTU Life Cycle Replacement	450	729	12	-	-	-	-	-	-	-	-	
476	2M	5780485	SCADA 2022 RTU Life Cycle Replacement	271	391	388	2	-	-	-	-	-	-	-	
477	2M	5780501	Drum Hydro SCADA Radio Replacement	36	3	-	-	-	-	-	-	-	-	-	
478	2M	5780502	Mother Lode Hydro SCADA Radio Replace	1	0	-	-	-	-	-	-	-	-	-	
479	2M	5780505	Shasta Hydro SCADA Radio Replacement	1	-	-	-	-	-	-	-	-	-	-	
480	2M	5780618	Pit 5 Unit 4 Rplc WGs, FPs & Seal Rings	743	3,977	3,552	5	-	-	-	-	-	-	-	
481	2M	5780659	Balch 2 - Bank 3 Replacement	95	13	44	94	689	-	429	5,626	2,130	-	-	
482	2M	5780661	Balch 2 - U2 Repl Transfrmr Mgmt Relays	98	7	8	8	4	-	203	865	341	-	-	
483	2M	5780662	Balch 2 - U3 Repl Transfrmr Mgmt Relays	94	7	7	8	4	-	202	865	343	-	-	
484	2M	5780663	Haas - U1 Turbine Vapor Mist Recovry Sys	47	11	527	767	6	-	-	-	-	-	-	
485	2M	5780664	Haas - U2 Turbine Vapor Mist Recovry Sys	-	324	336	-	-	-	-	-	-	-	-	
486	2M	5780665	Helms - Install Cycling Instrumentation	654	-	-	-	-	-	-	-	-	-	-	
487	2M	5780667	Helms - U1 InstlThrst Bracket LoadCells	-	-	-	23	251	296	27	234	-	-	-	
488	2M	5780668	Helms - U2 InstlThrst Bracket LoadCells	(24)	-	-	-	-	-	-	-	-	-	-	
489	2M	5780669	Helms - U3 InstlThrst Bracket LoadCells	-	-	-	15	199	-	111	649	-	-	-	
490	2M	5780670	Helms - Replace Sump Level Controls	(19)	-	-	-	-	-	-	-	-	-	-	
491	2M	5780671	Helms - U1 Replace Turbine Gage Board	42	28	14	10	5	-	(0)	305	473	-	-	
492	2M	5780672	Helms - U2 Replace Turbine Gage Board	48	25	53	14	16	-	71	346	449	96	-	
493	2M	5780673	Helms - U3 Replace Turbine Gage Board	35	31	27	9	5	-	0	304	470	-	-	
494	2M	5780674	Helms - U1 Wicket Gate Servomotor Refurb	3	9	23	364	1,536	-	-	-	-	-	-	
495	2M	5780675	Helms - Draft Tube Gate Improvements	6	98	185	376	(665)	-	55	72	356	105	101	
496	2M	5780698	Kings River - Repl Transfrmr Mgmt Relays	-	-	-	-	-	-	-	67	321	52	-	

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497	2M	5780794	Kings River Replace TSV Bypass Valve	40	21	20	118	-	-	-	-	-	-	-	
498	2M	5781045	Halsey TSV Actuator Replacement	-	-	-	-	14	-	-	-	-	780	3,280	
499	2M	5781162	Cresta PH U2 Rewind	965	2,172	216	-	-	-	0	(0)	(0)	125	9,372	
500	2M	5781191	JBB U2 Replace CT, PT, SA & Bus Duct	-	-	-	-	-	-	-	-	229	2,262	2,140	
501	2M	5781238	Belden PH Install Thrust Bearing 2018	3	-	-	-	-	-	-	-	-	-	-	
502	2M	5781318	Kings/Crane Hydro SCADA Radio Replcmnt	26	235	48	-	-	-	-	-	-	-	-	
503	2M	5781319	Helms Hydro SCADA Radio Replacement	104	1	-	-	-	-	-	-	-	-	-	
504	2M	5781538	Hat Creek 2 PH Replace Excitation System	240	28	381	1,571	63	-	-	-	-	-	-	
505	2M	5781539	Hat Creek 1 PH Replace Excitation System	24	-	-	-	-	-	-	-	-	-	-	
506	2M	5781540	Pit 6 PH Replace BOP Annunciators	0	-	-	-	-	-	-	-	-	-	-	
507	2M	5781541	Pit 6 Replace Station Service 1 Tranxfmr	558	12	-	-	-	-	-	-	-	-	-	
508	2M	5781542	Pit 6 Replace Station Service 2 Tranxfmr	764	8	-	-	-	-	-	-	-	-	-	
509	2M	5781543	Pit 7 Replace Station Service 1 Tranxfmr	14	56	277	469	(0)	-	-	-	-	-	-	
510	2M	5781544	Pit 7 Replace Station Service 2 Tranxfmr	13	59	588	-	-	-	-	-	-	-	-	
511	2M	5781545	JBB Replace Station Service 1 Tranxfmr	-	4	35	155	1,358	-	-	-	-	-	-	
512	2M	5781546	JBB Replace Station Service 2 Tranxfmr	-	-	-	37	85	1,839	75	-	-	-	-	
513	2M	5781551	Pit 6 U1 Repl Generator Mgmt Relay NERC	98	-	-	-	-	-	-	-	-	-	-	
514	2M	5781552	Pit 4 PH Replace BOP Annunciator	-	8	-	-	-	-	-	-	-	-	-	
515	2M	5781741	Poe PH U1 Repl Gen Fan Blades	21	1	-	-	-	-	-	-	-	-	-	
516	2M	5781759	Tiger Creek CEM Spare Bearings	(2)	8	19	-	95	-	-	-	-	-	-	
517	2M	5781859	Helms - Refurbish CB280	70	-	-	-	-	-	-	-	-	-	-	
518	2M	5781959	Pit 6 U2 Inst New Bus With Gen Breaker	0	0	(2)	-	-	-	-	-	-	-	-	
519	2M	5782001	Balch 2 - U2 TSV Dedicated Control Water	(97)	-	-	-	-	-	-	-	-	-	-	
520	2M	5782078	Helms - Replace Station Batteries	172	32	-	-	-	-	-	-	-	-	-	
521	2M	5782088	Pit 3 U2 Repl Generator Mgmt Relays NERC	558	1,224	507	-	-	-	-	-	-	-	-	
522	2M	5782089	Pit 3 U1 Repl Bearing Temperature Relay	-	-	-	-	-	-	113	-	-	-	-	
523	2M	5782090	JBB Unit 1 Replace Speed Switch	98	(0)	-	-	-	-	-	-	-	-	-	
524	2M	5782091	JBB Unit 2 Replace Speed Switch	35	62	-	-	-	-	-	-	-	-	-	
525	2M	5782146	Kings River - Replace Sump Valves	0	-	-	-	-	-	-	-	-	-	-	
526	2M	5782147	Kings River - Refurb Wicket Gate Servos	1	-	-	-	-	-	-	-	-	-	-	
527	2M	5782603	Poe PH Replace Hatches	37	2	-	-	-	-	-	-	-	-	-	
528	2M	5782983	Caribou 2 PH–AF Mitigation 208V Breakers	14	80	148	-	-	-	-	-	-	-	-	
529	2M	5782985	Cresta PH U1 Install Bearing Monitoring	-	-	-	-	-	-	-	-	-	208	469	
530	2M	5782986	Cresta PH U2 Install Bearing Monitoring	-	8	138	1,762	364	-	-	-	-	-	-	
531	2M	5782992	Lwr Feather Hydro RTU Radio Replacement	-	-	0	(0)	-	-	-	-	-	-	-	
532	2M	5782993	Upper Feather Hydro RTU Radio Replace	-	258	50	-	-	-	-	-	-	-	-	
533	2M	5782994	Potter Vly Hydro RTU Radio Replacement	-	18	2	-	-	-	-	-	-	-	-	
534	2M	5782996	Poe PH Replace Station Service Trans No1	-	-	-	-	18	-	249	428	468	-	-	
535	2M	5783073	Salt Springs 2 Repl Coils, RTDs, Bearing	-	-	-	-	-	-	233	476	2,569	156	-	
536	2M	5783125	Helms Replace 13.8kV Breakers	166	78	138	163	107	757	1,873	313	-	-	-	
537	2M	5783126	Helms Replace Ground Detection System	48	-	-	-	-	-	-	-	-	-	-	
538	2M	5783127	Helms U2 Repl Thrust Tub Door Seal	60	24	10	(149)	-	-	-	-	-	-	-	
539	2M	5783128	Helms U2 Replace Thrust Bearing LoadCell	368	-	-	-	-	-	-	-	-	-	-	
540	2M	5783129	AG Wishon Replace Station Batteries	64	74	98	16	-	-	-	-	-	-	-	
541	2M	5783130	Balch 2 Repl 22" Needle Vlv Actuat & Wir	1	1	24	9	35	-	689	70	-	-	-	
542	2M	5783131	Balch 2 U2 Governor Component Lifecycle	27	13	14	15	17	-	-	-	-	-	-	
543	2M	5783132	Balch 2 U2 Install Duplex Strainers	43	23	14	13	10	-	-	-	-	187	15	
544	2M	5783134	Balch 2 U3 Governor Component Lifecycle	23	11	12	13	31	-	-	-	259	992	57	
545	2M	5783137	K2 - Repl Transformer Mgmt Relays	(120)	-	-	-	-	-	-	-	-	-	-	
546	2M	5783158	K2 Replace Station Batteries	332	165	127	806	554	-	-	-	-	-	-	
547	2M	5783159	Kerckhoff 2 Install Air Monitoring	67	217	(3)	-	-	-	-	-	-	-	-	
548	2M	5783161	Kings River Replace Battery Chargers	24	30	-	-	-	-	-	-	-	-	-	
549	2M	5783170	Poe PH U2 Repl Gen Rotor Brake Ring	486	0	-	-	-	-	-	-	-	-	-	
550	2M	5783238	Drum 2 U5 Replace Generator Relays	4	1	1	1	0	-	54	318	1,471	-	-	
551	2M	5783292	Salt Springs 2 Repl Thrust Bearing Shoes	2	-	-	-	-	-	-	-	-	-	-	
552	2M	5783841	Helms - U2 Repl Turbine Equalizing Line	422	4	-	-	-	-	-	-	-	-	-	
553	2M	5784298	Wise 1 TSV Replacement	29	29	250	480	17	-	-	-	-	-	-	
554	2M	5784299	Spaulding 1 Replace Governor Servo	4	22	-	-	-	-	-	-	-	-	-	
555	2M	5784682	Bucks Cr Repl GSU XFMR 251T Relay NERC	1,593	842	58	-	22	-	-	-	-	-	-	
556	2M	5785015	Helms U2 TSV U/S Seal Secondary Source	82	-	-	-	-	-	-	-	-	-	-	
557	2M	5785092	Pit 6 U2 Repl Generator Relays	-	243	337	1,779	469	-	-	-	-	-	-	
558	2M	5785168	Camp 1 Office Repl Standby Generator	1	-	-	-	-	-	-	-	-	-	-	

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559	2M	5785173	Pit 7 U2 Inst New Bus With Gen Breaker	1	0	(1)	-	-	-	-	-	-	-	-	
560	2M	5785298	Caribou 1 Bank 8 Repl Spare XFMR Bushing	382	1	-	-	-	-	-	-	-	-	-	
561	2M	5785758	Electra U2 Gen Relays Replacement	1,128	1,185	-	-	-	-	-	-	-	-	-	
562	2M	5785782	Balch 2 U3 Install Duplex Strainers	49	20	11	11	9	-	-	-	-	229	74	
563	2M	5785793	Balch 2 U2 Replace Bearing Cooling Coil	62	11	6	23	32	-	-	-	-	-	-	
564	2M	5785794	Balch 2 U3 Replace Bearing Cooling Coil	100	14	10	27	34	-	-	-	-	1,424	199	
565	2M	5785795	Haas U1 Replace Bearing Cooling Coil	122	6	277	460	-	-	-	-	-	-	-	
566	2M	5785796	Haas U2 Replace Bearing Cooling Coil	33	199	437	45	-	-	-	-	-	-	-	
567	2M	5785818	Halsey PH Replace AC & DC Panel	33	-	-	-	-	-	-	-	-	-	-	
568	2M	5785860	Balch 2 Black Start High Lift Conversion	171	88	198	106	335	178	172	672	45	-	-	
569	2M	5785861	Haas Black Start High Lift Conversion	0	275	419	696	10	-	-	-	-	-	-	
570	2M	5786424	Bucks Cr Valvehouse Battery Replacement	310	-	-	-	-	-	-	-	-	-	-	
571	2M	5786680	Pit 6 Install Instrumentation Phase 1	3	125	259	2,010	602	-	-	-	-	-	-	
572	2M	5786718	Shasta PM Trailer PTP Radio Upgrade	4	(14)	-	-	-	-	-	-	-	-	-	
573	2M	5786879	Helms - U1 Repl Turbine Equalizing Line	0	28	69	159	80	65	359	33	-	-	-	
574	2M	5786880	Helms - U3 Repl Turbine Equalizing Line	0	27	68	162	81	65	361	60	-	-	-	
575	2M	5787218	Helms - U3 Repl TPC Rupture Disks	744	19	-	-	-	-	-	-	-	-	-	
576	2M	5787500	Poe PH SCADA Device Integration	273	-	-	-	-	-	-	-	-	-	-	
577	2M	5787578	Poe PH U2 Replace PRV Seats	74	-	-	-	-	-	-	-	-	-	-	
578	2M	5787718	Helms - U3 Replace Turbine Shaft Seal	504	90	-	-	-	-	-	-	-	-	-	
579	2M	5787959	Helms - Replace X1 X2 Bushings	1,378	18	-	-	-	-	-	-	-	-	-	
580	2M	5787971	SCADA 2023 RTU Life Cycle Replacement	56	3	11	42	21	-	-	-	-	-	-	
581	2M	5787972	SCADA 2024 RTU Life Cycle Replacement	141	352	559	368	55	-	-	-	-	-	-	
582	2M	5788224	Helms PH to Swyd Control Wiring Rpl	-	51	44	192	270	-	5,218	951	-	-	-	
583	2M	5788225	Helms Replace HPU Instrumentation	40	192	317	-	-	-	-	-	-	-	-	
584	2M	5788226	Haas U1 Rotor Pole Refurb	71	1,071	3,279	6,421	24	-	-	-	-	-	-	
585	2M	5788228	Balch 2 Bank 2 Replacement	91	15	16	104	690	-	426	6,501	1,384	-	-	
586	2M	5788231	Electra Bank Standby Generator	10	20	211	249	1,375	-	-	-	-	-	-	
587	2M	5788232	Mt Reba (ML) Replace Generator	152	578	16	-	-	-	-	-	-	-	-	
588	2M	5788235	Spring Gap Replace Batteries	841	4	-	-	-	-	-	-	-	-	-	
589	2M	5788237	Stanislaus Repl SS Panel, SWGR, Breakers	20	41	42	62	312	1,350	62	-	-	-	-	
590	2M	5788238	Caribou 1 Replace Bank 8A-B-C-SP	144	3,929	5,653	175	129	-	-	-	-	-	-	
591	2M	5788239	Butt Valley – Refurb Spare Transformer	2	383	-	-	-	-	-	-	-	-	-	
592	2M	5788247	Poe GSU Transformer Repl Bank 2	-	-	-	-	-	-	-	190	275	1,560	2,343	
593	2M	5788249	Caribou 2 PH Replace Annunciators	-	195	256	1	-	-	-	-	-	-	-	
594	2M	5788541	AM: Centrifuge - Capital	(1)	-	-	-	-	-	-	-	-	-	-	
595	2M	5789058	Helms - U2 Repl Governor Air Compressor	28	22	-	-	-	-	-	-	-	-	-	
596	2M	5789147	Helms - U1 Replace Turbine Shaft Seal	1	298	1,256	3	-	-	-	-	-	-	-	
597	2M	5789321	Helms - U1 Repl Governor Air Compressor	23	23	-	3	31	-	-	-	-	-	-	
598	2M	5789322	Helms - U3 Repl Governor Air Compressor	-	37	-	-	-	-	-	-	-	-	-	
599	2M	5789323	K2 - Replace TSV Strainers	100	366	-	-	-	-	-	-	-	-	-	
600	2M	5789324	K2 Replace Thrust Bearing RTDs	40	178	-	-	-	-	-	-	-	-	-	
601	2M	5789339	Kings River Replace Annunciators	-	-	-	5	(5)	-	-	-	-	-	-	
602	2M	5789538	Dutch Flat VH Standby Generator	53	2	-	-	-	-	-	-	-	-	-	
603	2M	5789598	West Point PRV Controls Upgrade	39	76	545	1,877	75	-	-	-	-	-	-	
604	2M	5789720	Salt Springs Rplc Transformer Bushings	197	5	-	-	-	-	-	-	-	-	-	
605	2M	5791359	Haas U2 Rotor Pole Refurb	1,385	3,342	4,147	7	-	-	-	-	-	-	-	
606	2M	5792369	West Point Rewind Generator	11	675	140	334	7,926	2,826	-	-	-	-	-	
607	2M	5792459	Pit 3 Replace GSU Transformer Bushings	-	(0)	-	-	-	-	-	-	-	-	-	
608	2M	5792565	Baum Lake Upgrade RTU	-	-	-	-	-	-	-	-	-	78	275	
609	2M	5792567	Pit 1 Dam Ugrade RTU Gates 4 & 5	-	-	-	-	58	-	-	-	-	-	-	
610	2M	5792568	Lake Britton Upgrade RTU	-	-	-	-	-	-	-	-	-	-	234	
611	2M	5792569	Pit 5 Diversion Dam Upgrade RTU	-	-	-	-	15	-	-	-	-	-	-	
612	2M	5792577	Pit 3 PH Replace Gen CTs & Bus SWs	-	-	24	111	102	-	634	61	-	-	-	
613	2M	5792578	Pit 6 Install Inverter for HPOL's	-	-	-	-	-	-	757	95	-	-	-	
614	2M	5792579	JBB Install Inverter for HPOL's	-	-	-	-	18	-	-	476	-	-	-	
615	2M	5792690	West Point Upgrade Valve House HPU	-	17	320	297	673	416	-	-	-	-	-	
616	2M	5792691	Stanislaus Replace TSV Control	-	61	113	195	(8)	-	359	1,158	-	-	-	
617	2M	5792719	Dutch Flat Replace Brush Rigging	-	23	2	23	50	-	-	-	-	-	-	
618	2M	5792722	Lake Tabeaud Replace Wheel Gate Controls	-	-	165	510	467	277	644	94	-	-	-	
619	2M	5792734	Balch 1 Replace Stator Louver Controls	-	22	55	6	150	-	-	-	1,056	557	-	
620	2M	5792735	Drum 2 U5 Repl CCVT	-	6	3	1	0	-	-	96	138	-	-	

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621	2M	5792740	Haas Replace PSV Seat	-	-	-	-	0	-	110	1,358	285	-	-	
622	2M	5792741	Kerchoff 2 PH Replace ISO Meters	-	73	127	9	-	-	-	-	-	-	-	
623	2M	5792742	Haas Install ISO Phase Maint Platform	-	-	42	89	104	-	58	2,691	-	-	-	WP 3-232
624	2M	5792750	Helms - U2 Repl Demin Cooling Water Sys	-	8	5	1	1	-	202	664	76	-	-	
625	2M	5792751	Balch - Replace Sandtrap Valves	8	172	222	29	49	-	(0)	1,001	659	-	-	
626	2M	5792761	Poe U2 Repl WG Servo Bushings and Seals	-	-	-	81	448	-	-	-	-	-	-	
627	2M	5792764	Poe PH Install Seal Ring Protection	-	-	23	212	1,034	-	-	-	-	-	-	
628	2M	5792765	Poe PH Replace Bank 2 Lighting Arrestors	1	91	-	-	-	-	-	-	-	-	-	
629	2M	5792766	Butt Valley TSV/Mech Overspeed Upgrade	-	-	-	-	-	-	-	-	-	104	234	
630	2M	5792922	Caribou 2 Install Inverters for HPOL's	-	28	89	651	395	-	-	-	-	-	-	
631	2M	5792938	Kings River GSU Bank Replacement	-	-	8	232	252	-	426	599	2,530	15	-	
632	2M	5792939	Balch 2 U2 Reinsulate Field Poles	-	-	-	15	110	-	0	-	-	-	-	
633	2M	5792941	Kerckhoff 2 Replace CB 172	-	-	123	211	1,332	-	-	-	-	-	-	
634	2M	5792943	Kings River Rotor Pole Refurb	-	-	-	-	-	-	-	-	-	130	469	
635	2M	5792947	Helms Liquid Rheostat A	-	-	-	-	-	-	-	119	183	52	469	
636	2M	5792950	Kerckhoff 2 - Mitigate Arc Flash 480v	-	-	129	180	165	2,663	1,357	-	-	-	-	
637	2M	5792954	Crane Valley PH Replace ISO Meters	-	-	-	30	23	-	-	-	-	-	-	
638	2M	5793558	Drum Siphon Trash Rack Improvements	-	-	-	129	100	1,662	-	-	-	-	-	
639	2M	5793569	Tiger Creek Pnstk Replace Bellows Joint	-	-	-	-	40	450	776	-	-	-	-	
640	2M	5793574	Spaulding Dam Install Emerg Generator	-	-	-	-	-	-	116	333	9	-	-	
641	2M	5793576	Stanislaus Refurbish TWD 1	-	-	0	1	135	357	237	712	237	1,992	51	
642	2M	5793580	Drum PHs 1 & 2 - Install Smoke Detection	-	-	-	120	741	-	-	-	-	-	-	
643	2M	5793582	Newcastle Cooling Water Flow Meters	-	-	-	-	18	-	-	-	-	-	-	
644	2M	5793586	West Point Rlpc Generator Field Breaker	-	-	-	-	-	-	311	-	-	-	-	
645	2M	5793592	Spaulding 1 Rewind	-	-	-	-	-	-	-	-	-	-	750	
646	2M	5793605	Dutch Flat Refurbish Servo Rod	-	-	-	-	-	-	-	-	-	-	94	
647	2M	5793621	Stan PH Rpl Thrust Bearing Cooling Coil	-	1	98	871	5,294	-	-	-	-	-	-	
648	2M	5794125	Helms PH U2 Repl TSV Mechanical Locks	1	605	9,371	-	-	-	-	-	-	-	-	
649	2M	5794158	Hat Creek 2 PH Repl Pwr Potential Xfmr	23	55	-	-	-	-	-	-	-	-	-	
650	2M	5794991	Cresta PH Automation PHA	115	658	4,232	6,020	291	-	-	-	-	-	-	
651	2M	5795443	SCADA 2025 RTU Life Cycle Replacement	90	75	229	2,121	3,324	2,000	-	-	-	-	-	
652	2M	5795638	Helms Inst ODCS Evergreen Upgrade	-	336	519	762	68	-	-	-	-	-	-	
653	2M	5796090	Haas - U2 Inst Brush Dust Collection Sys	-	174	232	-	-	-	-	-	-	-	-	
654	2M	5796104	Balch 2 208v Bus-Tie	-	411	232	265	16	-	-	-	-	-	-	
655	2M	5796298	Pit 3 U2 Replace Generator Relays	-	-	733	1	-	-	-	-	-	-	-	
656	2M	5796488	Pit 3 Replace Bank 3/IG & 3/ID Switches	-	115	8	9	5	-	1,334	-	-	-	-	
657	2M	5796489	Pit 6 Replace Draft Tube Cones	-	208	53	19	11	-	-	-	-	-	-	
658	2M	5796883	Cresta PH U2 Upgr Gen Protection Relays	-	-	-	-	-	-	-	-	-	62	234	
659	2M	5797519	K2 - Repl Auto-Synchronizer	-	303	48	-	-	-	-	-	-	-	-	
660	2M	5797752	Helms – Refurbish DTG Cylinder Ctrls	-	148	1,900	(0)	-	-	-	-	-	-	-	
661	2M	5797753	Helms - Major Component Lifecycle Repl	-	129	308	(338)	(23)	-	-	-	-	-	-	
662	2M	5798031	Electra U2 Replace Bearings/RTDs	-	-	64	428	470	-	103	1,626	161	-	-	
663	2M	5798060	Crane Valley PH - Repl Bank 1 Bushings	-	275	192	(9)	-	-	-	-	-	-	-	
664	2M	5798259	Belden PH Repl WG Bushings and FPs	-	420	1,056	1,668	314	-	238	314	325	395	382	
665	2M	5798275	SJ2 - Replace Bank 1 Bushings	-	217	(9)	-	-	-	-	-	-	-	-	
666	2M	5798382	Helms - Station Service Relay Upgrade	-	1	37	170	300	-	49	-	-	-	-	
667	2M	5798383	Haas U1 Inst Brush Dust Collection Sys	-	-	107	332	2	-	-	-	-	-	-	
668	2M	5798385	Helms Upgr Sequence Event Recorder SER	-	-	118	900	633	-	-	-	-	-	-	
669	2M	5798387	Kings River - ReplaceTSV	-	-	133	518	4,961	5,369	-	-	-	-	-	
670	2M	5798444	Caribou 1 U2 Repl Needles & Seats	-	362	39	-	-	-	-	-	-	-	-	
671	2M	5798445	Bucks Creek PH U1 Replace Gen Breaker	-	110	304	2,400	-	-	-	-	-	-	-	
672	2M	5798450	Salt Springs Tunnel 1 PSV trip cntl Rplc	-	-	-	-	-	-	-	428	1,101	-	-	
673	2M	5798451	Tiger Creek FB LLO Abandonment	-	-	42	161	103	-	-	-	-	-	-	
674	2M	5798518	Caribou 1 PH U2 Upgr Gen Protect Relays	-	-	-	-	150	-	233	3,089	367	-	-	
675	2M	5798519	Cresta PH U1 Upgr Gen Protection Relays	-	-	-	-	-	-	116	119	550	624	-	
676	2M	5798818	Helms - Replace 43 Switches U1	-	5	150	-	-	-	-	-	-	-	-	
677	2M	5799218	Pit 3 Replace GSU Transformer	-	379	1,616	1,390	626	-	451	-	-	-	-	
678	2M	5799878	Helms - U1 Replace TSV Downstream Seal	-	-	3,081	-	-	-	-	-	-	-	-	
679	2M	5800015	Caribou 1 U3 Repl Needles & Seats	-	-	176	-	-	-	-	-	-	-	-	
680	2M	5800139	Potter Valley PH Replace GSU XFMR Bank 1	-	-	116	(116)	-	-	-	-	-	-	-	
681	2M	5800500	Helms -U2 Repl 43 Switch	-	-	86	-	-	-	-	-	-	-	-	
682	2M	5800501	Helms -U3 Repl 43 Switch	-	-	79	-	-	-	-	-	-	-	-	

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683	2M	5800558	Poe PH U1 Refurbish GSU XFMR Bank 1	-	-	435	173	-	-	-	-	-	-	-	
684	2M	5800559	Poe PH U1 Install GSU XFMR Bank 1 SPR	-	-	38	148	212	-	-	-	-	-	-	
685	2M	5800658	Cresta PH Repl U1 Seal Rings	-	-	316	1,868	45	-	-	-	-	-	-	
686	2M	5800699	Bucks Creek PH U2 Replace Rotor	-	-	993	4,244	5,115	-	-	-	-	-	-	
687	2M	5800744	Hat Creek 2 PH Replace Turbine Bearing	-	-	-	723	42	-	-	-	-	-	-	
688	2M	5800745	Hat Creek 1 PH Replace Turbine Bearing	-	-	-	-	18	-	-	-	-	-	-	
689	2M	5800820	Pit 3 Replace GSU Transformer Bushings	-	262	290	-	-	-	-	-	-	-	-	
690	2M	5801158	Pit 4 Replace Station Service Tranxfmrs	-	-	80	426	344	1,505	-	-	-	-	-	
691	2M	5801758	Poe PH Automation PHA	-	-	335	1,221	3,519	-	292	384	3,887	4,443	-	
692	2M	5801759	West Point PH Automation PHA	-	-	1	0	0	-	-	-	-	-	-	
693	2M	5801978	Helms Replace STP Conduit	-	-	150	-	-	-	-	-	-	-	-	
694	2M	5802558	GMS Upgrade	-	-	1,427	-	-	-	-	-	-	-	-	
695	2M	5802604	Pit 6 Replace Low Voltage Switchgear	-	-	-	-	-	-	-	-	-	156	169	
696	2M	5802620	JBB PH Unit 1 Automation PHA	-	-	1	211	8	-	0	(0)	0	222	617	
697	2M	5802622	Cresta PH Repl U2 Seal Rings	-	-	319	4,923	95	-	-	-	-	-	-	
698	2M	5802625	Electra U3 Replace Needle Servo	-	-	-	83	46	1,257	-	-	-	-	-	
699	2M	5802628	West Point Replace Bearing Cooling Coils	-	-	1	25	802	313	-	-	-	-	-	
700	2M	5802629	West Point Replace Generator Relays	-	-	-	583	1,938	346	-	-	-	-	-	
701	2M	5802630	West Pt Upgr Gen Instruments SCADA RTDs	-	-	-	500	2,148	617	-	-	-	-	-	
702	2M	5802631	West Point Replace Generator Exciter	-	-	-	-	14	513	399	2,575	-	-	-	
703	2M	5802738	Kings River Install Secondary TSV Bypass	-	-	7	388	28	-	-	-	-	-	-	
704	2M	5802798	Helms Replace Generator CB 280	-	-	-	-	17	-	308	48	-	-	-	
705	2M	5802799	Helms U1 Replace Thrust Bearing LoadCell	-	-	-	37	963	705	-	-	-	-	-	
706	2M	5802800	Helms U1 Replace CWS Demineralizer	-	-	-	-	-	-	-	-	138	780	-	
707	2M	5802802	Kerckhoff Dam Replace RTU with PLCs	-	-	-	43	116	-	1,114	-	-	-	-	
708	2M	5802826	Drum U4 Refrb Turbine andThrust Bearing	-	-	-	-	2	1,446	39	48	1,421	-	-	WP 3-224
709	2M	5802827	Newcastle Replace TSV Bypass Piping	-	-	-	129	4	-	-	-	-	-	-	
710	2M	5802828	Wise 1 PH Install New Digital Governor	-	-	-	82	302	-	1,064	133	-	-	-	
711	2M	5802885	Rock Creek PH Repl GSU XFMR Bank 1ABC&SP	-	-	-	99	105	-	64	2,035	2,417	2,134	1,801	
712	2M	5802905	Helms Replace Turbine Maint Platforms	-	-	-	-	38	-	129	1,414	-	-	-	
713	2M	5803278	Pit 6 PH U1 Repl CT, PT, SA ,& Bus Duct	-	-	-	-	-	-	-	122	309	2,421	2,290	
714	2M	5803279	Pit 6 PH U2 Repl CT, PT, SA ,& Bus Duct	-	-	-	-	-	-	-	-	117	351	2,181	
715	2M	5803280	Pit 7 PH U1 Replace CT, SA, & Bus Duct	-	-	-	14	466	-	26	774	1,676	-	-	
716	2M	5803281	Pit 7 PH U2 Replace CT, SA, & Bus Duct	-	-	-	-	68	-	-	492	945	1,789	-	
717	2M	5803498	Pit 1 PH U1 Refurbish LGB	-	-	707	2,837	-	-	-	-	-	-	-	
718	2M	5803541	Wise 1 PH Automation PHA	-	-	-	177	604	-	21	433	1,784	190	-	
719	2M	5803658	Balch 2 U2/U3 Replace 5&12 Way Valve	-	-	178	21	6	-	-	-	-	419	34	
720	2M	5803659	Balch 1 and 2 TWD Install VFD	-	-	8	190	79	-	-	-	-	-	-	
721	2M	5803660	Helms U3 Rotor Demo	-	-	2	67	1,770	-	-	-	-	-	-	
722	2M	5803785	Electra U3 Replace Bushings	-	-	9	664	5	-	-	-	-	-	-	
723	2M	5803878	Helms Unit 3 Replace Excitation XFMR	-	-	-	66	959	625	-	-	-	-	-	
724	2M	5803883	Helms U1,U2,U3 Excit Xfmr Instl DGA Mon	-	-	-	47	703	-	-	-	-	-	-	
725	2M	5804118	Crane Valley PH Annunciator Upgrade	-	-	-	104	12	-	-	-	-	-	-	
726	2M	5804198	Pit 3 PH Instl Grounding Brushes & Instr	-	-	-	32	40	-	-	-	-	-	-	
727	2M	5804200	Pit 5 Unit 3 Upgr Gen Relay GE SR489	-	-	-	-	-	-	-	-	24	345	37	
728	2M	5804201	Pit 5 Unit 4 Upgr Gen Relay GE SR489	-	-	-	-	-	-	-	-	-	30	342	
729	2M	5804202	JBB Unit 1 Upgrade Gen Relay GE SR489	-	-	-	-	-	-	196	29	-	-	-	
730	2M	5804203	Hat Creek 2 Upgrade Gen Relay GE SR489	-	-	-	-	-	-	17	264	30	-	-	
731	2M	5804208	Pit 4 Unit 2 PH Automation PHA	-	-	-	-	-	-	-	143	1,009	1,815	187	
732	2M	5804209	Pit 4 PH U1 Inst Vibration Monitoring	-	-	-	-	5	-	153	276	878	145	-	
733	2M	5804210	Pit 4 PH U2 Inst Vibration Monitoring	-	-	-	-	5	-	153	276	878	145	-	
734	2M	5804214	Inskip Diversion Dam CB108 Upgrade RTU	-	-	-	-	17	745	-	-	-	-	-	
735	2M	5804215	Coleman Diversion Dam CB 110 Upgrade RTU	-	-	-	-	18	-	-	-	-	-	-	
736	2M	5804222	Helms U1,2,3 Pnstk Flow Cntrl Upgrade	-	-	-	3	(3)	-	-	-	-	-	-	
737	2M	5804583	Balch 2 & 3 PH Modernization PHM	-	-	-	361	1,106	-	240	174	81	-	1,023	
738	2M	5804584	Cresta Phase 2 PH Automation PHA	-	-	-	10	92	-	125	249	1,618	1,564	-	
739	2M	5804593	Cresta PH Replace U2 Thrust Collar	-	-	-	149	223	-	-	-	-	-	-	
740	2M	5804718	Helms Install Centrifuge	-	-	-	383	40	-	-	-	-	-	-	
741	2M	5804818	Cresta U2 PRV Repl Draft Tube Section	-	-	-	298	56	-	-	-	-	-	-	
742	2M	5804921	Drum U4 Refurbish Gen Bearing	-	-	-	36	65	-	-	-	-	-	-	
743	2M	5804924	Bucks Creek PH U2 Replace Gen Breaker	-	-	-	908	368	-	-	-	-	-	-	
744	2M	5805106	Tiger Creek Repl Station Svc XFMR Bk 3	-	-	-	30	160	-	348	-	-	-	-	

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745	2M	5805442	Poe Dam Replace Breakers	-	-	-	308	679	378	-	-	-	-	-	
746	2M	5805578	Cresta U2 Repl Turbine Guide Bearing	-	-	-	157	254	-	-	-	-	-	-	
747	2M	5805718	Halsey Replace Tranfomer Bushings	-	-	-	24	380	-	-	-	-	-	-	
748	2M	5805719	Belden PH Repl Thrust Bearing 2023	-	-	-	5,419	3,161	-	-	-	-	-	-	
749	2M	5805810	Shasta Hydro Rdg Office Instl IT Infrast	-	-	-	1	333	-	-	-	-	-	-	
750	2M	5805812	Tiger Creek Rplc TSV Bypass Valve	-	-	-	33	217	-	-	-	-	-	-	
751	2M	5805941	Cresta PH U1 Upgrade Turbine	-	-	-	63	119	-	155	476	1,647	1,867	3,550	
752	2M	5805968	JBB to Iron Cyn Install Fiber Optic Com	-	-	-	-	15	-	246	1,806	92	-	-	
753	2M	5805969	JBB & IC LLO Install Fiber Cable	-	-	-	-	19	891	389	2,979	790	-	-	
754	2M	5806198	Helms U2 Instll Thrust Bracket LoadCells	-	-	-	1	121	-	58	126	505	-	-	
755	2M	5806262	Electra U3 Replace Needle Bushing	-	-	-	-	575	-	-	-	-	-	-	
756	2M	5806386	Cresta PH Repl GSU XFMR Bank 1 ABC & SP	-	-	-	110	88	-	2,179	1,356	1,455	3,262	-	
757	2M	5806397	Drum 1-4 PH Automation PHA	-	-	-	-	9	-	-	420	233	4,473	117	
758	2M	5806452	Belden PH Inst Manual Sync Aux Relay	-	-	-	-	-	-	-	-	55	146	-	
759	2M	5806478	Helms Repl Mercury Switches & Devices	-	-	-	-	72	-	-	-	-	-	-	
760	2M	5806540	Helms U2 Refurb Wicket Gate Servo	-	-	-	-	0	-	-	521	3,219	287	-	
761	2M	5806541	K2 Replace Cooling Water System	-	-	-	-	-	-	155	190	183	208	2,999	
762	2M	5806542	Helms - Refurbish CB 270	-	-	-	-	17	-	311	48	-	-	-	
763	2M	5806543	Helms - Refurbish CB 290	-	-	-	-	15	-	311	48	-	-	-	
764	2M	5806545	Crane Valley Replace GSU Bank 1	-	-	-	-	14	-	-	-	329	73	1,687	
765	2M	5806546	Helms Repl LRB Cooling Water Valve	-	-	-	-	10	-	0	-	229	416	47	
766	2M	5806578	Kings River Pnstk Drainage Improvement	-	-	-	-	26	-	-	476	459	52	-	
767	2M	5806579	Kerckhoff Res Install New Inflow Gauge	-	-	-	-	12	-	-	-	-	-	-	
768	2M	5806580	K2 - Inst Station Svc Alternate Source	-	-	-	-	30	-	-	-	-	281	1,593	
769	2M	5806581	Helms T1 Install Stilling Well Access	-	-	-	-	14	-	71	228	1,009	83	-	
770	2M	5806586	Balch 1 Penstock Improvements	-	-	-	-	11	-	309	951	46	-	-	
771	2M	5806587	Balch 1 Repl 13.2 kV Med Volt Switchgear	-	-	-	-	47	-	226	1,940	711	-	-	WP 3-165
772	2M	5806588	Balch 2 PH Repl CWTR PIT Stop Gate	-	-	-	-	16	-	78	816	92	-	-	
773	2M	5806589	Balch 2 U2 - Mitg LGB Oil Leak	-	-	-	-	17	-	38	713	46	-	-	
774	2M	5806598	Haas VH Install Manual Transfer Switch	-	-	-	-	15	-	-	-	284	1,248	141	
775	2M	5806620	Helms PSP 230KV Cable Fire System Refurb	-	-	-	-	-	-	-	143	1,147	2,080	70	
776	2M	5806818	Caribou 2 PH U4 Upgr Gen Protect Relays	-	-	-	-	18	-	-	-	296	335	1,880	
777	2M	5806819	Rock Creek Dam Replace Gate Control RTUs	-	-	-	-	18	-	43	547	-	-	-	
778	2M	5806820	DeSabla PH Replace VLRA Batteries	-	-	-	-	38	-	-	0	284	1,248	141	
779	2M	5806841	Cresta Dam Replace Gate Control RTUs	-	-	-	-	4	-	249	552	-	-	-	
780	2M	5806858	Helms CB280 Breaker Monitoring Retrofit	-	-	-	0	25	-	-	-	-	-	-	
781	2M	5806978	Helms - Replace 580 TSV Valves	-	-	-	277	286	-	-	-	-	-	-	
782	2M	5807218	Helms U1 M1 & M3 Arc Damage A&C Phases	-	-	-	428	10	-	-	-	-	-	-	
783	2M	5807272	Salt Springs Rplc Cooling Water Piping	-	-	-	-	-	-	116	333	734	52	-	
784	2M	5807658	Haas Butterfly VLV Trunnion Nut Repl	-	-	-	-	3	-	-	-	-	-	-	
785	2M	5808138	Helms Upgr SER Phase II	-	-	-	-	8	-	205	1,759	37	-	-	
786	2M	5808218	Helms - Repl Reverse Disconnects w/ Brkr	-	-	-	-	-	-	-	119	321	52	-	
787	2M	5808219	K2 Repl Wicket Gate Servo Bushings	-	-	-	-	18	-	1,397	-	-	-	-	
788	2M	5808279	Helms U3 Repl DTG Fairing Plate	-	-	-	-	1,535	-	-	-	-	-	-	
789	2M	5808344	Rock Creek PH Repl GSU XFMR Banks 2ABC	-	-	-	-	18	-	78	2,157	1,927	4,421	-	
790	2M	5808539	Cresta PH U2 Replace TGB Tub	-	-	-	-	134	-	-	-	-	-	-	
791	2M	5808618	Spaulding 2 Replace Wicket Gates	-	-	-	-	-	-	-	-	-	-	469	
792	2M	5808623	Newcastle Replace Brush Rigging	-	-	-	-	-	-	-	-	-	-	187	
793	2M	5808638	Helms U2 Station Service Bus Replacement	-	-	-	-	-	-	776	71	-	-	-	
794	2M	5808709	Pit 4 PH Replace Heat Exchanger	-	-	-	-	-	-	116	190	275	52	-	
795	2M	5808719	AG Wishon HPU-2 PLC Upgrade	-	-	-	-	57	-	-	-	-	-	-	
796	2M	5808720	Haas - Air Surface Cooler Leaking Repl	-	-	-	-	0	-	-	-	-	-	-	
797	2M	5808838	Spaulding 3 Rplc Excitier Brush Holder	-	-	-	-	176	-	-	-	-	-	-	
798	2M	5808858	Haas Replace 13.8kv Upper Disconnect SW	-	-	-	-	12	-	876	167	-	-	-	
799	2M	5808900	Helms U1 Governor Controls Upgrade	-	-	-	-	29	-	390	72	-	-	-	
800	2M	5808902	AG Wishon - Replace Exciter	-	-	-	-	-	-	-	119	229	1,560	1,874	
801	2M	5808903	Helms Purchase Spare Turbine CV 1 thru 5	-	-	-	-	17	-	975	-	-	-	-	
802	2M	5808919	Camp One Replace Fuel Tanks	-	-	-	10	123	-	-	-	-	-	-	
803	2M	5808961	Belden PH Replace Seal Rings	-	-	-	-	1,353	1,794	-	-	-	-	-	
804	2M	5808965	Rock Creek U1 Upgr Cool Wtr Stnr	-	-	-	-	-	-	116	285	92	-	-	
805	2M	5808966	Rock Creek U2 Upgr Cool Wtr Stnr	-	-	-	-	-	-	116	285	92	-	-	
806	2M	5809022	Balch 1 PH Automation PHA	-	-	-	-	-	-	194	238	229	1,560	141	

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807	2M	5809138	Helms U1 Gov Comp Lifecycle Rplc	-	-	-	-	-	-	-	-	-	-	47	
808	2M	5809139	Helms U2 Gov Comp Lifecycle Rplc	-	-	-	-	-	-	116	1,541	1,697	-	-	
809	2M	5809140	Helms U3 Gov Comp Lifecycle Rplc	-	-	-	-	-	-	-	-	-	-	234	
810	2M	5809239	Helms LRA PLC Replacement	-	-	-	-	-	-	-	95	229	52	-	
811	2M	5809258	Haas U1 Replace Turbine Bearing Cooling	-	-	-	-	78	-	-	770	-	-	-	
812	2M	5809259	Haas U2 Replace Turbine Bearing Cooling	-	-	-	-	79	-	-	792	-	-	-	
813	2M	5809318	Helms U1 Repl DTG Fairing Plate	-	-	-	-	1,507	-	-	-	-	-	-	
814	2M	5809319	Helms U2 Repl DPL Seal	-	-	-	-	816	-	-	-	-	-	-	
815	2M	5809358	Spaulding 1 PRV Discharge Liner Rplc	-	-	-	-	23,156	541	-	-	-	-	-	
816	2M	5809446	Spaulding 1 Lower Intake Actuator Rplc	-	-	-	-	212	-	-	-	-	-	-	
817	2M	5809538	Balch PH1 U1 Install Sync Check Relay	-	-	-	-	-	-	194	48	-	-	-	
818	2M	5809558	Hat Crk 1 Replace Gov Accumulator Tank	-	-	-	-	-	-	-	143	321	78	-	
819	2M	5809559	Hat Crk 2 Replace Gov Accumulator Tank	-	-	-	-	-	-	-	143	321	78	-	
820	2M	5809560	Pit 3 U1 Replace Gov Accumulator Tank	-	-	-	-	-	-	116	333	69	-	-	
821	2M	5809561	Pit 3 U2 Replace Gov Accumulator Tank	-	-	-	-	-	-	-	143	321	78	-	
822	2M	5809562	Pit 3 U3 Replace Gov Accumulator Tank	-	-	-	-	-	-	-	143	321	78	-	
823	2M	5809563	Pit 1 U1 Replace Gov Accumulator Tank	-	-	-	-	-	-	128	366	76	-	-	
824	2M	5809564	Pit 1 U2 Replace Gov Accumulator Tank	-	-	-	-	-	-	128	366	76	-	-	
825	2M	5809565	Pit 5 U1 Replace Gov Accumulator Tank	-	-	-	-	-	-	128	366	76	-	-	
826	2M	5809566	Pit 5 U2 Replace Gov Accumulator Tank	-	-	-	-	-	-	128	366	76	-	-	
827	2M	5809567	Pit 5 U3 Replace Gov Accumulator Tank	-	-	-	-	-	-	128	366	76	-	-	
828	2M	5809568	Pit 5 U4 Replace Gov Accumulator Tank	-	-	-	-	-	-	128	366	76	-	-	
829	2M	5809579	Pit 3 PH U1, U2, U3 Automation PHA	-	-	-	-	-	-	-	-	-	-	1,031	
830	2M	5809581	Pit 7 PH U2 Automation PHA	-	-	-	-	-	-	-	-	229	333	1,031	
831	2M	5809582	Pit 1 PH U1 & U2 Automation PHA	-	-	-	-	-	-	248	1,046	1,601	208	-	
832	2M	5809658	Spaulding 2 Repl Wicket Gate and Runner	-	-	-	-	1,515	383	-	-	-	-	-	
833	2M	5809661	Electra U1&U2 Repl TSV Bypass Gaurd Vlv	-	-	-	-	367	-	-	-	-	-	-	
834	2M	5809662	Spaulding 1 Tunnel Instl Training Wall	-	-	-	-	2,132	4,000	-	-	-	-	-	
835	2M	5809738	Helms Unit 1 Draft Tube Gate Install	-	-	-	-	281	1,305	2,222	5,512	8,769	5,091	50	
836	2M	5809739	Helms Unit 2 Draft Tube Gate Install	-	-	-	-	-	-	-	-	688	1,325	24,028	
837	2M	5809740	Helms Unit 3 Draft Tube Gate Install	-	-	-	-	517	-	1,088	1,725	4,071	20,551	217	
838	2M	5809741	Helms Draft Tube Gate Tunnels	-	-	-	-	518	-	611	790	20,785	25	-	
839	2M	5810198	Spaulding 1 PRV B Discharge Liner Rplc	-	-	-	-	519	23,828	-	-	-	-	-	
840	2M	5810358	Helms U1-2-3 Replace kV Cables	-	-	-	-	-	-	-	119	229	1,560	2,343	
841	2M	5810362	Helms U2 Replace Excitation System	-	-	-	-	-	-	-	-	92	312	703	
842	2M	5810367	Balch 2 U2 Replace Exciter Controls	-	-	-	-	-	-	-	119	321	520	47	
843	2M	5810368	Balch 2 U3 Replace Exciter Controls	-	-	-	-	-	-	-	119	321	520	47	
844	2M	5810369	Haas U1 Replace Exciter Controls	-	-	-	-	-	-	-	119	321	832	422	
845	2M	5810370	Haas U1 Inst Exciter Brushell Excitation	-	-	-	-	-	-	-	119	321	520	47	
846	2M	5810371	Haas U2 Inst Exciter BrushlessExcitation	-	-	-	-	-	-	-	119	321	520	47	
847	2M	5810372	Haas U2 Replace Exciter Controls	-	-	-	-	-	-	-	119	321	832	47	
848	2M	5810373	Haas PH Inst AutoXfmr 21Kv to 12Kv Tie	-	-	-	-	-	-	-	119	321	520	-	
849	2M	5810376	K2 U1 Replace Exciter Controls	-	-	-	-	-	-	-	119	229	364	469	
850	2M	5810380	Kings River PH Automation PHA	-	-	-	-	-	-	-	-	-	130	890	
851	2M	5810438	West Point Intake Trash Rake Instl	-	-	-	-	238	-	-	-	716	-	-	
852	2M	5810659	Helms U1 DTG Improvements	-	-	-	-	1,547	-	-	-	-	-	-	
853	2M	5810660	Helms U2 DTG Improvements	-	-	-	-	2,135	867	-	-	-	-	-	WP 3-268
854	2M	5810661	Helms U3 DTG Improvements	-	-	-	-	1,749	570	-	-	-	-	-	
855	2M	5810738	Helms U3 Rewind Starting Motor	-	-	-	-	109	-	1,150	5,132	12,935	6,491	5,623	
856	2M	5810818	Helms U1-U3 Rotor Brake Ring Improvement	-	-	-	-	-	-	116	143	138	520	469	
857	2M	5811208	Spaulding 2 Replc Bearings and Gov Ctrls	-	-	-	-	2,681	-	-	-	-	-	-	
858	2M	5811278	Helms Lifecycle Replacement – U1	-	-	-	-	-	911	3,890	6,563	10,310	11,921	485	
859	2M	5811279	Helms Lifecycle Replacement – U2	-	-	-	-	-	801	3,258	4,811	6,817	10,080	335	
860	2M	5811281	Helms Lifecycle Replacement – U3	-	-	-	-	-	911	3,890	6,563	10,310	11,921	38,406	
861	2M	5811358	Helms U1 Pnstk Field Weld Coating	-	-	-	-	34	-	-	-	-	-	-	
862	2M	5811518	Spring Gap Gov Accumulator Tank Instl	-	-	-	-	8	-	78	285	459	-	-	
863	2M	5811971	JBB Whole Unit Replacement	-	-	-	-	-	-	-	-	-	1,040	937	
864	2M	5811972	Pit 6 Whole Unit Replacement	-	-	-	-	-	-	-	-	-	-	937	
865	2M	5811978	Pit 4 U1 PRV PLC Upgrade	-	-	-	-	-	-	97	571	1,055	52	-	
866	2M	5811979	Pit 4 U2 PRV PLC Upgrade	-	-	-	-	-	-	-	119	550	1,196	47	
867	2M	5812029	Spa 1 Gen Inst Manual Lift Oil Jack Sys	-	-	-	-	-	-	-	-	-	104	94	
868	2M	5812058	Drum Pittman Catch Basin Restoration	-	-	-	-	-	-	-	143	69	1,456	23	

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869	2M	5812080	Dutch Flat PH Repl Gov Accumulator Tank	-	-	-	-	-	-	-	143	183	16	-	
870	2M	5812086	Spaulding 2 PH Repl Solid State Exciter	-	-	-	-	-	-	-	-	-	-	328	
871	2M	5812089	Electra Main Transformer Rplc Relay	-	-	-	-	-	-	621	-	-	-	-	
872	2M	5812090	Spring Gap FBay Install Butterfly Valve	-	-	-	-	-	-	-	285	780	-	-	
873	2M	5812091	Tiger Creek Canal Install Liner 2030	-	-	-	-	-	-	-	-	-	-	750	
874	2M	5812092	Tiger Creek Canal Install Liner 2029	-	-	-	-	-	-	-	-	-	832	-	
875	2M	5812094	Stanislaus Rplc Cooling Water strainer#2	-	-	-	-	-	-	-	143	183	-	-	
876	2M	5812096	Stan Penstock Install two 12" drain valv	-	-	-	-	-	-	-	190	-	-	-	
877	2M	5812100	Salt Springs U1 RTDs and Cooling System	-	-	-	-	-	-	-	-	-	1,248	1,406	
878	2M	5812103	West Point Replace Gov Accumulator Tank	-	-	-	-	-	-	-	-	92	208	-	
879	2M	5812104	Electra U2 Replace Gov Accumulator Tank	-	-	-	-	-	-	-	-	-	104	187	
880	2M	5812105	Electra U1 Replace Gov Accumulator Tank	-	-	-	-	-	-	-	-	92	208	-	
881	2M	5812106	Salt Sprgs U1 Repl Gov Accumulator Tank	-	-	-	-	-	-	-	95	183	-	-	
882	2M	5812107	Tiger Creek U1 Repl Gov Accumulator Tank	-	-	-	-	-	-	-	-	-	104	281	
883	2M	5812108	Tiger Creek U2 Repl Gov Accumulator Tank	-	-	-	-	-	-	-	-	-	104	187	
884	2M	5812109	Deer Creek ML Replace Siphon Bellows	-	-	-	-	-	-	-	95	275	-	-	
885	2M	5812110	Panther Creek Replace Siphon Bellows	-	-	-	-	-	-	-	-	-	260	469	
886	2M	5812111	Meadow Lake Dam Inst Instru ADAS	-	-	-	-	-	-	-	-	-	-	234	
887	2M	5812113	Salt Springs Dam Rplc 12 Gate Hoist	-	-	-	-	-	-	582	713	2,752	4,681	-	
888	2M	5812159	Helms Install Spare 230kV Breaker	-	-	-	-	-	-	-	-	69	104	47	
889	2M	5812160	Helms - U1 Repl Station Service XFMR	-	-	-	-	-	-	-	-	138	156	328	
890	2M	5812161	Helms U1 Replace Excitation XFMR	-	-	-	-	-	-	-	-	115	364	1,406	
891	2M	5812162	Helms U1 Replace Bank 11 XFMR	-	-	-	-	-	-	-	119	321	1,456	47	
892	2M	5812163	Helms U2 Replace GSU Transformer	-	-	-	-	-	-	-	-	-	104	469	
893	2M	5812164	Helms U3 Repl Station Service XFMR	-	-	-	-	-	-	-	48	92	260	469	
894	2M	5812165	Helms U2 Replace Bank 12 XFMR	-	-	-	-	-	-	-	-	138	260	1,312	
895	2M	5812166	Helms U3 Replace Bank 13 XFMR	-	-	-	-	-	-	-	-	138	260	1,312	
896	2M	5812167	Helms Repl Ctrl Valve Seals (CV9 & CV10)	-	-	-	-	-	-	-	-	115	520	70	
897	2M	5812168	Helms U2 Repl Station Service XFMR	-	-	-	-	-	-	-	48	92	260	469	
898	2M	5812169	Helms T1 Refurb T1GH Wheelgate	-	-	-	-	-	-	388	48	-	-	-	
899	2M	5812170	Helms U3 Runner Band Drain Valve	-	-	-	-	-	-	-	-	-	130	797	
900	2M	5812171	Helms U2 Ref Thrust & Guide Bear	-	-	-	-	-	-	-	-	-	156	422	
901	2M	5812172	Helms U3 Refurb Thrust & Guide Bear	-	-	-	-	-	-	-	-	-	-	141	
902	2M	5812173	Helms U1 Replace Exciter	-	-	-	-	-	-	-	143	229	364	703	
903	2M	5812174	Helms U2 Replace Exciter	-	-	-	-	-	-	-	-	138	260	328	
904	2M	5812175	Helms U3 Replace Exciter	-	-	-	-	-	-	-	-	-	156	234	
905	2M	5812176	Helms U2 Rewind Starting Motor	-	-	-	-	-	-	-	-	-	156	469	
906	2M	5812177	Helms U1 Install Gen Breaker	-	-	-	-	-	-	-	48	92	260	937	
907	2M	5812178	Helms U2 Install Gen Breaker	-	-	-	-	-	-	-	143	229	1,040	984	
908	2M	5812179	Helms U3 Install Gen Breaker	-	-	-	-	-	-	-	-	138	260	937	
909	2M	5812180	Kings River PH Generator Rewind	-	-	-	-	-	-	-	-	-	-	117	
910	2M	5812181	San Joaquin 3 Repl Ohio Brass SW 35	-	-	-	-	-	-	-	-	-	156	234	
911	2M	5812185	Kerchoff PH Replace PSV 1, 2 & 3	-	-	-	-	-	-	-	-	-	-	843	
912	2M	5812186	K2 Replace the AC and DC HPL pumps	-	-	-	-	-	-	116	476	46	-	-	
913	2M	5812187	K2 Repl Main Bank	-	-	-	-	-	-	-	119	459	520	70	
914	2M	5812188	Kings River Whole Unit Replacement	-	-	-	-	-	-	-	-	917	1,040	33,323	
915	2M	5812189	Balch 2 PH TWD SEG Installation	-	-	-	-	-	-	194	713	46	-	-	
916	2M	5812201	AG Wishon Replace Penstock 2	-	-	-	-	-	-	-	-	-	-	656	
917	2M	5812241	SCADA 2026 RTU Life Cycle Replacement	-	-	-	-	-	-	3,105	-	-	-	-	
918	2M	5812242	SCADA 2027 RTU Life Cycle Replacement	-	-	-	-	-	-	-	6,163	-	-	-	
919	2M	5812243	SCADA 2028 RTU Life Cycle Replacement	-	-	-	-	-	-	-	-	5,255	-	-	
920	2M	5812244	SCADA 2029 RTU Life Cycle Replacement	-	-	-	-	-	-	-	-	-	6,366	-	
921	2M	5812245	SCADA 2030 RTU Life Cycle Replacement	-	-	-	-	-	-	-	-	-	-	5,623	
922	2M	5812251	Belden PH Upgr Heat Exchange OSPP Sys	-	-	-	-	-	-	-	-	92	260	281	
923	2M	5812253	Bucks Creek PH Replace GSU XFMR Bank 1	-	-	-	-	-	-	-	-	183	1,040	1,874	
924	2M	5812254	Bucks Storage Dam Intake Tower Retrofit	-	-	-	-	-	-	-	-	459	780	1,406	
925	2M	5812261	Butt Valley Inst Manual Sync Check Relay	-	-	-	-	-	-	-	-	55	146	-	
926	2M	5812321	Cresta PH Replace MV CB 52-24	-	-	-	-	-	-	-	-	-	-	94	
927	2M	5812322	Cresta Tunnel 2023 Improvements	-	-	-	-	-	-	-	95	229	624	-	
928	2M	5812330	Poe PH Replace Station Service Bank 2	-	-	-	-	-	-	-	48	159	239	647	
929	2M	5812333	Rock Creek PH Improv Pnstk Pedestals	-	-	-	-	-	-	-	143	183	520	94	
930	2M	5812335	Rock Creek PH Modernization PHM	-	-	-	-	-	-	-	-	-	-	234	

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Line No.	MWC	Planning Order	Description	2020 Recorded	2021 Recorded	2022 Recorded	2023 Recorded	2024 Recorded	2025 Forecast	2026 Forecast	2027 Forecast	2028 Forecast	2029 Forecast	2030 Forecast	Reference
931	2M	5812336	Rock Creek PH Upgr Remote Oper Cntrls	-	-	-	-	-	-	-	-	-	-	94	
932	2M	5812337	Toadtown Replace Generator Breaker	-	-	-	-	-	-	-	-	275	-	-	
933	2M	5812827	Hydro Modernization Program	-	-	-	-	-	-	4,771	10,000	10,000	11,000	11,000	
934	2M	5812905	Rock Creek PH U2 Repl Gen Shaft	-	-	-	-	-	-	-	-	138	1,560	2,343	
935	2M	5812972	Rock Creek PH U1 Replace WG & Seals	-	-	-	-	-	-	-	-	-	312	937	
936	2M	5814280	Helms Lifecycle Replacement – U1(credit)	-	-	-	-	-	(911)	(3,890)	(6,563)	(10,310)	(11,921)	(485)	
937	2M	5814281	Helms Lifecycle Replacement – U2(credit)	-	-	-	-	-	(801)	(3,258)	(4,811)	(6,817)	(10,080)	(335)	
938	2M	5814282	Helms Lifecycle Replacement – U3(credit)	-	-	-	-	-	(911)	(3,890)	(6,563)	(10,310)	(11,921)	(38,406)	
939	2M	5814283	Dept of Energy Grants (credit)	-	-	-	-	-	-	-	(2,925)	(8,439)	-	-	
940	**2M**	**2M Total**		**94,880**	**114,434**	**114,150**	**115,908**	**196,209**	**127,175**	**118,896**	**202,981**	**209,832**	**200,121**	**243,622**	Sum of Lines 254-939
941	**2M**														
942	2N	5511186	DeSabla Inst/Repl Rsrvrs, Dams & Wtrwys	187	49	16	303	155	100	85	115	122	152	151	WP 3-449
943	2N	5511187	Shasta Inst/Repl Rsrvrs, Dams & Wtrwys	-	66	10	16	56	100	85	115	122	152	151	WP 3-449
944	2N	5511188	Drum Inst/Repl Rsrvrs, Dams & Wtrwys	242	187	22	4	2	100	85	115	122	152	151	WP 3-449
945	2N	5511189	MLode Inst/Repl Rsrvrs, Dams & Wtrwys	2	66	114	4	-	-	85	115	122	152	151	WP 3-449
946	2N	5537959	Inskip Remove Diversion Dam	(201)	(3)	(14)	-	-	-	-	-	-	-	-	
947	2N	5538460	Coleman Decommission Asbury Pipe	-	-	(804)	-	-	-	-	-	-	-	-	
948	2N	5559031	Helms Inst/Repl Rsrvrs, Dams & Wtrwys	-	-	-	-	-	-	85	115	122	152	151	
949	2N	5559033	KCV Inst/Repl Rsrvrs, Dams & Wtrwys	-	-	-	-	-	-	85	115	122	152	151	
950	2N	5720804	Lime Saddle Modify Intake Structure	-	-	-	-	-	-	-	-	-	-	9	
951	2N	5720818	Crane Valley System Gunite Ditches	11	(149)	-	-	-	-	-	-	-	-	-	
952	2N	5724406	Potter Valley Scott Dam Needle Valve Sys	(0)	-	-	-	-	-	-	-	-	-	-	
953	2N	5739327	Coleman Inst. Tailrace Barrier Trashrake	233	6	-	-	-	-	-	-	-	-	-	
954	2N	5747178	Bucks Rebuild Milk Ranch Div 3	93	145	138	131	1,949	155	-	-	-	-	-	
955	2N	5747263	Lake Valley Shotcrete	-	-	-	-	26	-	-	-	-	-	750	
956	2N	5747826	Butt Valley PSV Aux Operating Equip	148	20	-	-	-	-	-	-	-	-	-	
957	2N	5748841	Kerckhoff 1 - Instl Tailrace Gate	28	(372)	-	-	-	-	-	-	-	-	-	
958	2N	5753359	Helms - T2 & Bypass Tunnel Lining	7	-	-	-	-	-	-	-	-	-	-	
959	2N	5753478	Lake Valley (Drum) LLO Repl Pipe	4,433	47	(2)	-	-	-	-	-	-	-	-	
960	2N	5753578	Kerckhoff Dam - Repl LLO Gate	-	49	-	-	-	-	-	-	-	-	-	
961	2N	5757566	Pit 3 PH Tailrace Slot & Conc. Replac	12	-	-	-	-	-	-	-	-	-	-	
962	2N	5757904	Browns Dam - Install IFR/Repl Dam Sec	17	16	18	(267)	-	-	-	-	-	-	-	
963	2N	5760168	Cresta Replace Stoplog Hoist	228	(3)	-	-	-	-	-	-	-	-	-	
964	2N	5760169	Cresta PSV Aux Equip Replace/Rebuild	33	24	26	28	28	-	27	110	378	416	-	
965	2N	5760176	Butte Canal Bank Stabilization	(473)	-	-	-	-	-	-	-	-	-	-	
966	2N	5760219	Easement Mitigation	0	0	0	0	0	-	-	-	-	-	-	
967	2N	5760698	N. Fork Willow Creek Dam Replace Gates	2	2	2	(40)	-	-	-	-	-	-	-	
968	2N	5761120	Pit 4 Replace PSV Valve Controls	154	2,584	432	52	1	-	-	-	-	-	-	
969	2N	5761263	San Joaquin 2 - Install Mech Trash Rake	6	6	6	7	4	146	573	-	-	-	-	
970	2N	5764004	Relief Dam (Stan) LLO Bevel Gear Repl	1	-	-	-	-	-	-	-	-	-	-	
971	2N	5766145	Pit 1 LLO Gate Rplc & Radial Gate Seals	2,164	256	14	-	-	-	-	-	-	-	-	
972	2N	5766147	Battle Creek Flow Monitoring Upgrades	39	-	-	-	-	-	-	-	-	-	-	
973	2N	5766245	YB 93 Automate Towle Diversion	24	107	247	(3)	-	-	-	-	-	-	-	
974	2N	5766390	K Dam - Instl Remote Op Fish Rel Valve	963	94	-	-	-	-	-	-	-	-	-	
975	2N	5767608	Coleman Repl Penstk Cathodic Protection	(1)	-	-	-	-	-	-	-	-	-	-	
976	2N	5767984	Coleman Inst Intake Actuator Oil Contain	3	21	5	(64)	-	-	-	-	-	-	-	
977	2N	5768959	Cresta PH Repl Tailrace Stoplog Gates	340	445	728	366	30	-	-	-	-	-	-	
978	2N	5768960	Rock Cr PH Repl Tailrace Gates	129	398	239	1,463	62	-	-	-	-	-	-	
979	2N	5770968	South PH Install Digger Creek Div Gate	-	-	-	-	-	-	58	100	-	-	-	
980	2N	5771798	Poe Tunnel Liner Install	3,539	-	-	-	-	-	-	-	-	-	-	
981	2N	5771964	SouthPH Replace CrossCountry Flume Sheet	340	388	-	-	-	-	-	-	-	-	-	
982	2N	5772621	Kerckhoff Dam Repl Radial Gate Trunnion	0	0	1	1	(8)	-	-	-	-	-	-	
983	2N	5772725	Caribou 1 Upper Penstock Slope Shotcrete	2,206	42	-	-	-	-	-	-	-	-	-	
984	2N	5772731	Mountain Meadows Refurb Bypass Valve	(0)	-	-	-	-	-	-	-	-	-	-	
985	2N	5772741	PV Van Arsdale Rehab Fish Screen Frame	(344)	-	-	-	-	-	-	-	-	-	-	
986	2N	5772932	Stan Forebay LLO Mitigation	741	38	-	-	-	-	-	-	-	-	-	
987	2N	5772935	Tiger Crk Abay LLO Valve Replacement	4,938	256	18	3	-	-	-	-	-	-	-	
988	2N	5772959	Tiger Ck Forebay Replace Trash Rakes	282	276	2,191	500	18	-	-	-	-	-	-	
989	2N	5773441	Drum - SYC 8.5 Mile Improvements	(745)	(565)	-	-	-	-	-	-	-	-	-	
990	2N	5774444	Upper Blue Dam Seismic Stability Mitigat	114	22	50	-	-	-	-	-	-	-	-	
991	2N	5774834	JBBIC Dam Rt Abutment 2017 Storm Damage	(349)	(269)	-	-	-	-	-	-	-	-	-	
992	2N	5775318	Pit 1 Levee Inst Rip Rap 2017 Storm Dmg	(146)	(111)	-	-	-	-	-	-	-	-	-	

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993	2N	5775789	San Joaquin 1A - Install Retaining Wall	12	-	-	-	-	-	-	-	-	-	-	-
994	2N	5776899	Rock Cr Dam Drum Gate Repl Hose	-	-	-	-	-	400	-	-	-	-	-	-
995	2N	5776982	Volta 1 Restore Nora Penstock Foundation	787	(1)	-	-	-	-	-	-	-	-	-	-
996	2N	5777178	Volta 1 Lake Grace Embankment Rip Rap	1,275	6	-	-	-	-	-	-	-	-	-	-
997	2N	5777191	Volta 1 Lake Nora Embankment Inst RipRap	934	3	-	-	-	-	-	-	-	-	-	-
998	2N	5777487	Strawberry Dam (Stan)-Replace Liner 2019	81	-	-	-	-	-	-	-	-	-	-	-
999	2N	5777488	Strawberry Dam (Stan)-Replace Liner 2020	490	146	-	-	-	-	-	-	-	-	-	-
1000	2N	5777489	Strawberry Dam (Stan)-Replace Liner 2021	-	355	-	-	-	-	-	-	-	-	-	-
1001	2N	5777491	Relief Dam (Stanislaus) Replace Liner	1	0	-	-	-	-	-	-	-	-	-	-
1002	2N	5777493	Belden Spillway Refurbish Wall Panel	(53)	-	-	-	-	-	-	-	-	-	-	-
1003	2N	5778046	Balch 1 - Penstock AB6 Rock/Soil Fence	1	(7)	-	-	-	-	-	-	-	-	-	-
1004	2N	5778066	Spa LLO - Deer Creek Divert Flow	6	39	9	(125)	0	-	-	-	-	-	-	-
1005	2N	5778271	Lake Almanor Automate Instrumentation	126	118	139	87	348	-	830	38	-	-	-	WP 3-463
1006	2N	5778272	Butt Valley Dam Automate Instrumentation	110	124	110	83	324	-	27	1,746	-	-	-	WP 3-463
1007	2N	5778336	Lower Bear-Repl Cone Valve Actuators	(1)	-	-	-	-	-	-	-	-	-	-	-
1008	2N	5778440	Courtright Dam Upgrade I/D Gate Control	178	161	844	1,993	15,983	4,018	-	-	-	-	-	-
1009	2N	5778996	Griswold Cross Gate Trunnion Replacement	-	-	-	45	89	154	371	-	-	-	-	-
1010	2N	5779020	Drum - Carr Lake LLO Gate Replacement	-	-	-	-	-	-	-	-	-	-	94	
1011	2N	5779023	Spaulding Dam 1 Install Log Booms	-	-	-	-	30	1,276	1,628	1,441	-	-	-	-
1012	2N	5779122	YB 116 Remote Control Gate	-	-	-	-	32	-	-	-	-	-	-	-
1013	2N	5779207	Helms Repl Courtright LLO Bypass Viv DOE	5	1	102	1,010	1,219	511	-	-	-	-	-	WP 3-260
1014	2N	5779209	Helms - Install Incline Tunnel Liner	426	1,270	1,041	794	6,170	433	-	-	-	-	-	-
1015	2N	5779218	Tiger Crk ABay Erosion Protection DOE	192	367	128	6,632	15	-	-	-	-	-	-	-
1016	2N	5779222	Halsey Forebay Install Seepage Drain	71	(71)	-	-	-	-	-	-	-	-	-	-
1017	2N	5779450	Main Tuolumne Cl-Install Shot Lin 2019	361	0	-	-	-	-	-	-	-	-	-	-
1018	2N	5779452	Main Tuolumne Canal Spring Outage 2021	-	423	-	-	-	-	-	-	-	-	-	-
1019	2N	5779455	Philadelphia Ditch Flume-Instl Lnr 2019	(1)	-	-	-	-	-	-	-	-	-	-	-
1020	2N	5779456	Philadelphia Ditch Flume-Instl Lnr 2020	319	3	-	-	-	-	-	-	-	-	-	-
1021	2N	5779457	Philadelphia Ditch Flume-Instl Lnr 2021	-	6	5	-	-	-	-	-	-	-	-	-
1022	2N	5779459	Phoenix Install Flume Sheet Liner 2019	108	1	-	-	-	-	-	-	-	-	-	-
1023	2N	5779461	Main Tuolumne Canal Fall Outage 2021	-	449	46	176	-	-	-	-	-	-	-	-
1024	2N	5779462	Main Tuolumne Canal A Flume Replace 2022	-	-	222	74	-	-	-	-	-	-	-	-
1025	2N	5779463	Poe Dam Replace Gate Chains & LS DOE	122	138	87	1,081	954	4,494	3,065	-	-	-	-	-
1026	2N	5779470	Tiger Cr Cnl-Install Flume Lnr 2019/2020	4,770	-	-	-	-	-	-	-	-	-	-	-
1027	2N	5779471	Tiger Cr Cnl-Install Flume Lnr 2020/2021	2,099	2,407	-	-	-	-	-	-	-	-	-	-
1028	2N	5779472	Tiger Cr Cnl-Install Flume Lnr 2022/2023	-	737	2,612	-	-	-	-	-	-	-	-	-
1029	2N	5779498	RV Reservoir, Remote Monitoring	118	94	315	24	-	-	-	-	-	-	-	-
1030	2N	5779522	Salt Springs U1 Penstock Air Valves Repl	286	68	-	-	-	-	-	-	-	-	-	-
1031	2N	5779560	Salt Springs LLO & IFR Valve Maint Platf	-	19	7	168	136	435	-	-	-	-	-	-
1032	2N	5779561	Lower Bear LLO & IFR Valve Maint Platf	-	18	5	98	177	551	-	-	-	-	-	-
1033	2N	5779638	Tiger Creek Regulator Dam LLO Automation	-	-	4	171	329	498	24	-	-	-	-	-
1034	2N	5780440	Plt 7 Radial Gate Inst Backup Pwr Supply	414	(0)	-	-	-	-	-	-	-	-	-	-
1035	2N	5780441	Plt 6 Radial Gate Inst Backup Pwr Supply	298	-	-	-	-	-	-	-	-	-	-	-
1036	2N	5780459	M11 Replace Stilling Well Pipe & Valve	6	-	-	-	-	-	-	-	-	-	-	-
1037	2N	5780666	Helms - Wishon Replace I/D Gate Seal	(0)	-	-	-	-	-	-	-	-	-	-	-
1038	2N	5780747	Grizzly Fthy Dam Inst LLO	2,248	7	-	-	-	-	-	-	-	-	-	-
1039	2N	5780880	Phoenix Install Flume Sheet Liner 2023	-	-	-	423	0	-	-	-	-	-	-	-
1040	2N	5780881	Main Tuolumne Cl-Install Shot Lin 2023	-	-	-	475	-	-	-	-	-	-	-	-
1041	2N	5780885	Fordyce Dam Replace LLO and Guard Valves	153	313	716	405	287	-	333	773	6,619	1,080	300	
1042	2N	5781143	Spaulding Dam Alternate IFR	614	4	-	-	-	-	-	-	-	-	-	-
1043	2N	5781251	TC Reg Canal Replace Energy Dissipater	5	-	-	-	-	-	-	-	-	-	-	-
1044	2N	5781266	Drum Abay Install New Skimmer Gate Cntrl	39	-	-	-	-	-	-	-	-	-	-	-
1045	2N	5781299	Dutch Flat Tunnel Replace Sluice Valves	-	-	-	79	347	531	104	1,135	-	-	-	-
1046	2N	5781379	SS Dam Radial Gate Repair (C) - Phase 2	20	-	-	-	-	-	-	-	-	-	-	-
1047	2N	5781480	Tiger Creek Canal Install Drain System	1	-	-	-	-	-	-	-	-	-	-	-
1048	2N	5781760	K2 Repl Dewatering and Pnstk Root Valves	208	839	-	-	-	-	-	-	-	-	-	-
1049	2N	5782098	Upper Wise Culvert Inlet Replacement	2	272	(1)	-	-	-	-	-	-	-	-	-
1050	2N	5782240	Tiger Crk Canal 2018 Erosion Mitigation	0	-	-	-	-	-	-	-	-	-	-	-
1051	2N	5782278	Tiger Crk Canal Embank/Road Restoration	890	6	-	-	-	-	-	-	-	-	-	-
1052	2N	5782982	Belden Dam Spillway Deck Improvements	13	-	-	-	-	-	-	-	-	-	-	-
1053	2N	5782989	Toadtown Canal Mitigate Undermining	114	708	-	-	-	-	-	-	-	-	-	-
1054	2N	5782995	Philbrook Dam Install New Weir	76	104	284	87	142	1,552	-	-	-	-	-	WP 3-463

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1055	2N	5782998	Poe Dam Repl Bypass Gate Seals	4	27	4	62	27	330	-	-	-	-	-	
1056	2N	5783000	Lower Blue Seepage Reduction DOE	80	530	723	476	356	-	4,936	-	-	-	-	
1057	2N	5783598	South Canal Sta 19+50 Replace Underdrain	-	-	-	-	-	-	-	95	688	16	-	
1058	2N	5784170	BRC Erosion Mitigation (Sta 545+00)	1	-	-	-	-	-	-	-	-	-	-	
1059	2N	5784383	LWC Uplift Mitigation at Imperm Liner	8	-	-	-	-	-	-	-	-	-	-	
1060	2N	5784398	Tiger Creek AB Repl Radial Gate Chains	38	-	-	-	-	-	-	-	-	-	-	
1061	2N	5784683	Rock Creek Cresta Coffer Dam DOE	89	365	594	1,745	5,462	17,273	12,853	75	-	-	-	
1062	2N	5785096	Pit 3 LLO Replace No.1,2,3 Actuator	-	160	83	304	222	-	23	29	3,119	3,121	94	
1063	2N	5785171	Volta Lake Nora Replace Spill Basin Wall	243	(4)	-	-	-	-	-	-	-	-	-	
1064	2N	5785442	Canyon Dam LLO Install Cutoff Wall DOE	448	470	5,452	83	-	-	-	-	-	-	-	
1065	2N	5786404	Pit 6 U1 Repl Intake Gate Cntrl Sys SDOC	-	34	246	1,289	248	-	-	-	-	-	-	
1066	2N	5786405	Pit 6 U2 Repl Intake Gate Ctrl Sys SDOC	-	20	224	1,133	290	-	-	-	-	-	-	
1067	2N	5786406	Pit 7 U1 Repl Intake Gate Cntrl Sys SDOC	49	276	329	1,331	0	-	-	-	-	-	-	
1068	2N	5786407	Pit 7 U2 Repl Intake Gate Cntrl Sys SDOC	112	156	466	1,179	0	-	-	-	-	-	-	
1069	2N	5787318	JBB IC Dam LLO Rplce Act & Piping DOE	212	2,010	542	945	7,001	-	-	-	-	-	-	
1070	2N	5787439	Bucks Milk Ranch Conduit Inst 36" Valves	163	18	-	-	-	-	-	-	-	-	-	
1071	2N	5787458	JBB Iron Canyon Dam Install Weir DOE	21	6	192	859	42	-	-	-	-	-	-	
1072	2N	5787460	Poe Dam Instrumentation Improvements	184	-	-	-	-	-	-	-	-	-	-	
1073	2N	5787802	Halsey Forebay SAIP - Armoring	1	-	-	-	-	-	-	-	-	-	-	
1074	2N	5787970	Salt Springs Log Boom DOE	63	260	700	2,865	1,156	708	-	-	-	-	-	
1075	2N	5788227	Kerckchoff Replace Dam LLO Gate 1	-	1	109	156	300	5,575	4,602	48	-	-	-	
1076	2N	5788233	Salt Springs 1 Penstock Excess Flow Prot	54	93	467	812	2,445	47	-	-	-	-	-	
1077	2N	5788234	Spring Gap Forebay Install Generator	149	139	557	7	-	-	-	-	-	-	-	
1078	2N	5788241	Hendricks Canal Liner Improvements	26	(26)	-	-	-	-	-	-	-	-	-	
1079	2N	5788278	Strawberry Dam Rpl LLO Conduit&Comm DOE	128	601	257	847	307	-	-	-	-	-	-	
1080	2N	5789319	Drum Abay Replace Fish Release Valve	190	68	(1)	-	-	-	-	-	-	-	-	
1081	2N	5790116	PV Cape Horn Dam Fish Hotel Improvements	833	232	411	2	-	-	-	-	-	-	-	
1082	2N	5791361	Pit 7 Dam Log Boom Replacement DOE	107	1,480	87	854	2	-	-	-	-	-	-	
1083	2N	5792239	Pit 3 U3 Repl Tailrace Slot & Concrete	4,577	7	-	-	-	-	-	-	-	-	-	
1084	2N	5792566	Pit 1 Forebay Manufacture Stop Logs	-	-	-	-	16	-	-	285	-	-	-	
1085	2N	5792570	Pit 6 Dam Replace Annunciators	-	-	-	28	-	-	-	-	-	-	-	
1086	2N	5792572	Pit 7 Dam Replace Annunciators	-	-	-	5	0	-	-	-	-	-	-	
1087	2N	5792573	McCloud Dam LLO Repl. 5x7 SG Actuator	-	-	-	-	-	-	-	143	195	2,426	47	
1088	2N	5792574	Pit 3 Lake Britton Repl Stndby Gen DOE	-	44	269	496	2,423	-	-	-	-	-	-	WP 3-326
1089	2N	5792582	Pit 5 Diversion Dam Repl Lighting	-	107	-	-	-	-	-	-	-	-	-	
1090	2N	5792672	Bucks Creek Pnstk Upgr Erosion Protect	-	94	354	239	873	-	2,094	3,086	-	-	-	
1091	2N	5792673	Rock Cr Dam Repl Radial BP Gate Hoist	-	-	-	-	18	-	-	105	252	1,716	-	
1092	2N	5792674	Cresta Dam Repl Radial BP Gate Hoist	-	-	-	83	485	953	1,264	-	-	-	-	
1093	2N	5792675	Poe Dam Rpl Radial BP Gate Hoist & Cntrl	-	68	337	831	1,022	2,129	-	-	-	-	-	
1094	2N	5792676	Rock Creek Dam Replace Stilling Wells	-	77	128	83	124	105	80	1,425	28	-	-	WP 3-463
1095	2N	5792689	Drum Annual Cnl Liner Improvements 2021	-	1,133	187	-	-	-	-	-	-	-	-	
1096	2N	5792693	Meadow Lake Resurface Gunite Liner	-	10	(10)	-	-	-	-	-	-	-	-	
1097	2N	5792697	SYC U/S Little Tunnel Install Liner	-	316	-	-	-	-	-	-	-	-	-	
1098	2N	5792727	Spaulding Dam 2 Skimmer Gate Modificatio	-	5	(5)	-	-	-	78	143	413	-	-	
1099	2N	5792731	Lwr Bear Dam Gate Rplc Wire Rope lifting	-	31	30	-	-	-	-	-	-	-	-	
1100	2N	5792733	Spaulding Dam 3 Leakage Weir Handrails	87	0	-	-	-	-	-	-	-	-	-	
1101	2N	5792918	Spaulding Dam 1 Install Weir	-	116	93	706	1	-	-	-	-	-	-	
1102	2N	5792945	Courtright Install Reservoir Monitoring	-	-	105	-	-	-	-	-	-	-	-	
1103	2N	5792946	Helms - Wishon Res Inst Add'l Monitoring	-	52	8	-	-	-	-	-	-	-	-	
1104	2N	5793557	Tiger Creek Abay Spillway Gates Automati	-	-	71	377	5,141	5,257	-	-	-	-	-	
1105	2N	5793560	Drum Annual Cnl Liner Improvements 2022	-	-	1,360	24	1	-	-	-	-	-	-	
1106	2N	5793561	Drum Annual Cnl Liner Improvements 2023	-	-	-	1,330	(204)	-	-	-	-	-	-	
1107	2N	5793562	Drum Annual Cnl Liner Improvements 2025	-	-	-	-	48	2,325	-	-	-	-	-	
1108	2N	5793564	Drum Annual Cnl Liner Improvements 2026	-	-	-	-	-	-	-	-	2,752	31	-	
1109	2N	5793565	BRC Relocate Ragsdale Racks	-	-	-	1	271	-	57	346	936	2,269	-	
1110	2N	5793568	Spaulding 2 Dam Replace Apron	-	-	-	-	137	-	2,207	-	-	-	-	
1111	2N	5793570	Pittman Spill Channel Improvements	-	-	-	-	-	-	-	143	92	832	9	
1112	2N	5793571	Alta PH Penstock Bypass Install	-	-	-	199	310	983	1,657	47	-	-	-	
1113	2N	5793584	Halsey Afterbay Dam Inflow Design Flood	-	-	-	-	4	-	0	95	-	-	-	WP 3-463
1114	2N	5793585	Salt Spr Dam Spillway Automate Gates 6-8	-	-	-	-	15	-	-	-	-	-	-	
1115	2N	5793587	Drum Abay Repl Radial Gate Remote Cntrls	-	-	-	96	235	-	995	-	-	-	-	
1116	2N	5793588	Phoenix Install Flume Sheet Liner 2024	-	-	-	-	410	-	-	-	-	-	-	

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1117	2N	5793589	Phoenix Install Flume Sheet Liner 2025	-	-	-	-	-	-	-	666	-	-	-	
1118	2N	5793590	Drum Canal Tahoe Spill Replace Gate	-	-	-	-	-	-	-	-	115	156	9	
1119	2N	5793593	Phoenix Install Flume Sheet Liner 2026	-	-	-	-	-	-	-	-	642	-	-	
1120	2N	5793594	MainTuolumne Cl-Install Shot Lin 2024	-	-	-	-	943	-	-	-	-	-	-	
1121	2N	5793595	Phoenix Install Flume Sheet Liner 2025	-	-	-	-	-	-	-	-	734	-	-	
1122	2N	5793597	Philadelphia Ditch Flume-Instl Lnr 2022	-	-	312	-	-	-	-	-	-	-	-	
1123	2N	5793598	Philadelphia Ditch Flume-Instl Lnr 2023	-	-	-	354	-	-	-	-	-	-	-	
1124	2N	5793599	Main Tuolumne B Flume Lining 2024	-	-	-	-	329	-	-	-	-	-	-	
1125	2N	5793600	Philadelphia Ditch Flume-Instl Lnr 2025	-	-	-	-	-	-	-	571	-	-	-	
1126	2N	5793601	Philadelphia Ditch Flume-Instl Lnr 2026	-	-	-	-	-	-	-	-	734	-	-	
1127	2N	5793602	Fuller Lake Aux Spillway Replace Rip Rap	-	-	-	-	8	-	-	-	-	-	-	
1128	2N	5793613	Drum U1 Discharge Install Erosion Pro	(0)	-	-	-	-	-	-	-	-	156	281	
1129	2N	5794798	Tiger Cr Cnl-Install Flume Lnr 2021/2022	-	2,159	-	-	-	-	-	-	-	-	-	
1130	2N	5795284	Fordyce Radial Gate Seal Replacement	-	357	-	-	-	-	-	-	-	-	-	
1131	2N	5795439	Kerckhoff Dam Install Standby Generator	-	78	139	126	163	302	1,309	22	-	-	-	
1132	2N	5795559	Tiger Creek Canal Dissipater Install	-	28	118	161	1	-	-	-	-	-	-	
1133	2N	5795675	Tiger Creek ABay Gate No. 6 Repl Seal	-	1,123	25	-	-	-	-	-	-	-	-	
1134	2N	5795820	Salt Springs Dam Repl Standby Generator	-	-	-	260	173	475	-	-	-	-	-	
1135	2N	5796724	Drum Fiddler Green Canal Liner Rpl	-	105	-	-	-	-	-	-	-	-	-	
1136	2N	5796921	South Repl XCountry Flume Sheets Ph2	-	-	132	443	278	-	-	-	-	-	-	
1137	2N	5797779	Pit 5 Dam Refurbish Left Wing Wall	-	-	147	376	288	305	4,112	24	-	-	-	
1138	2N	5797891	Coleman Forebay Dam Inst Seepage Monitor	-	67	111	53	2,584	-	-	-	-	-	-	
1139	2N	5798061	Pit 1 Levee Install Buttress DOE	-	1,188	1,392	567	85	-	-	-	-	-	-	
1140	2N	5798438	Relief Dam Resurface Upstream Liner	-	69	441	2,064	2,785	3,094	3,080	3,780	18,071	18,098	19,211	
1141	2N	5798439	Manzanita Dam Refrurbish LLO	-	-	101	126	358	684	928	9	-	-	-	
1142	2N	5798452	Spaulding 2 Dam Apron Extension	-	-	549	3	-	-	-	-	-	-	-	WP 3-506
1143	2N	5798454	Philadelphia Canal Road Improvements	-	-	35	3	20	-	122	246	3,063	-	-	
1144	2N	5798500	Pit 4 Dam Replace Steel Footbridge	-	-	-	130	240	305	3,592	-	-	-	-	
1145	2N	5798898	Tiger Creek Cnl Sta 575 Slope Protection	-	26	29	90	88	747	-	-	-	-	-	
1146	2N	5798990	Lower Feely Crest Restoration Drum	-	35	316	216	1,064	1,634	-	-	-	-	-	
1147	2N	5799754	MT Canal A Flume Storm Replacement	-	95	279	-	-	-	-	-	-	-	-	
1148	2N	5799780	Relief Dam U/S Liner Patching	-	-	398	99	50	-	-	-	-	-	-	
1149	2N	5799838	Kelly Lake Erosion Protc and Tree Reml	-	-	460	1,187	11	-	-	-	-	-	-	
1150	2N	5799860	Butte Canal Restore 3/1 Flume Section	-	-	92	-	-	-	-	-	-	-	-	
1151	2N	5800005	Poe Dam Toe Void Install Cutoff Wall DOE	-	-	116	408	328	200	1,166	5,162	92	-	-	
1152	2N	5800458	Cresta PH Refurbish Tailrace	-	-	1,842	148	-	-	-	-	-	-	-	
1153	2N	5800522	Lower Rock (Drum) LLO Replacement	-	-	13	148	-	-	-	-	-	-	-	
1154	2N	5800746	Pit 1 VH Recoat Penstocks	-	-	-	36	52	-	-	593	24	-	-	
1155	2N	5800748	Pit 3 Dam Rest Plunge Pool & Wing Wall	-	-	-	38	186	-	279	407	7,106	26	-	
1156	2N	5801336	Hat Creek 1 Refb Canal and Embankment	-	-	-	58	234	3,734	-	-	-	-	-	
1157	2N	5801419	Canyon Dam Outlet Structure Improvements	-	-	928	177	-	-	-	-	-	-	-	
1158	2N	5801922	West Point Replace Penstock Air Valves	-	-	-	112	224	-	-	-	-	-	-	
1159	2N	5801984	Lake Almanor LLO Tunnel Repl Liner DOE	-	-	5,589	1,384	-	-	-	-	-	-	-	
1160	2N	5802174	Meadow Lake Dam Seepage Reduction	-	-	-	856	37	-	-	-	-	-	-	
1161	2N	5802175	Lyons Dam Replace Lifting Ropes	-	-	-	10	109	-	-	-	-	-	-	
1162	2N	5802599	Pit 5 Diversion Dam Refb Spillway Apron	-	-	-	-	9	-	-	333	1,835	62	-	
1163	2N	5802601	JBBIC Dam ABN Piezometers & RMV Bldg.	-	-	-	4	69	-	-	-	-	-	-	
1164	2N	5802602	Pit 7 Dam Radial Gate Chain Replacement	-	-	-	-	-	65	547	42	4	3	-	
1165	2N	5802603	Pit 6 Dam Radial Gate Chain Replacement	-	-	-	7	0	131	544	38	-	-	-	
1166	2N	5802632	Main Tuolumne Q Flume Mitigate Erosion	-	-	-	239	315	1,552	-	-	-	-	-	
1167	2N	5802633	Sand Bar Dam Reduce Leakage	-	-	-	69	453	-	806	2,066	1,883	3,121	25,000	
1168	2N	5802821	Upper Peak Mitigate Seismic Deformation	-	-	-	6	316	-	102	3,749	101	-	-	
1169	2N	5802822	Drum U4 Tailrace Install Liner	-	-	-	118	85	649	-	-	-	-	-	
1170	2N	5802823	Lake Valley Canal Install Drains	-	-	-	88	355	-	-	-	-	-	-	
1171	2N	5802878	Belden Intake Structure Seismic Improve	-	-	-	-	40	-	82	238	275	312	4,686	
1172	2N	5802879	LA Canyon Dam LLO Replace Gate 1 Stem	-	-	-	250	5,326	60	-	-	-	-	-	
1173	2N	5802898	Kerckhoff Dam Inst Auto Gate Hoists 1-14	-	-	-	32	360	256	86	2,018	10,290	89	-	
1174	2N	5802899	Fordyce Dam Replace Radial Gate Actuator	-	-	-	11	183	-	123	162	1,579	76	-	
1175	2N	5803558	SJ1 Fby Dam Inst Rip Rap Erosion Control	-	-	-	-	7	-	-	-	-	-	-	
1176	2N	5803993	Pit 1 Forebay Dam Restore Upstream Slope	-	-	-	-	20	-	-	-	-	681	136	WP 3-475
1177	2N	5804162	Helms PH Repl. T1 Hydr Pump & Motor	-	-	-	49	173	-	112	1,665	-	-	-	
1178	2N	5804179	Main Tuolumne Canal Intake Pipe Rplc	-	-	-	-	31	-	194	257	2,294	-	-	

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1179	2N	5804211	Pit 3 PSV Control System Power Upgrade	-	-	-	-	-	-	194	71	-	-	-	
1180	2N	5804217	McCloud Dam Replace Log Boom	-	-	-	-	114	250	366	951	92	-	-	
1181	2N	5804464	Main Tuolumne Cl-Install Shot Lin 2027	-	-	-	-	-	-	-	-	-	832	-	
1182	2N	5804465	Main Tuolumne Cl-Install Shot Lin 2028	-	-	-	-	-	-	-	-	-	-	750	
1183	2N	5804468	Philadelphia Ditch Flume-Instl Lnr 2027	-	-	-	-	-	-	-	-	-	832	-	
1184	2N	5804471	Philadelphia Ditch Flume-Instl Lnr 2030	-	-	-	-	-	-	-	-	-	-	750	
1185	2N	5804472	Phoenix Install Flume Sheet Liner 2027	-	-	-	-	-	-	-	-	-	728	-	
1186	2N	5804473	Phoenix Install Flume Sheet Liner 2028	-	-	-	-	-	-	-	-	-	-	656	
1187	2N	5804922	Main Tuolumne Canal Inst Gauge Stations	-	-	-	-	16	423	324	647	46	-	-	
1188	2N	5805158	SJ 2 Ditch 2 Rplc Canal	-	-	-	-	821	108	-	-	-	-	-	
1189	2N	5805441	Hendricks Head Dam Spillway Improv	-	-	-	-	90	1,006	-	-	-	-	-	
1190	2N	5805443	Rock Creek Dam Upgr Drum Gate Indicators	-	-	-	42	496	1,642	57	-	-	-	-	
1191	2N	5805464	Crane Valley IFR LLO Rpl Pipe	-	-	-	35	173	1,200	-	-	-	-	-	
1192	2N	5805818	Lwr Bear LLO Replace Pipe Fasteners	-	-	-	-	15	-	-	-	-	-	-	
1193	2N	5805970	Pit 6 Dam Replace Debris Boom	-	-	-	-	53	-	1,585	48	-	-	-	
1194	2N	5805971	Pit 4 Dam Debris Boom Replacement	-	-	-	-	-	-	388	1,888	46	-	-	
1195	2N	5806261	Tiger Creek Rplc Penstock Saddle blocks	-	-	-	-	-	-	-	190	413	-	-	
1196	2N	5806382	Butte Canal Restoration 8-10-23	-	-	-	539	48	-	-	-	-	-	-	
1197	2N	5806395	Wise FB Install Rip Rap	-	-	-	-	17	-	-	-	183	1,560	23	WP 3-475
1198	2N	5806396	Towle Lennon Flume Sheet Replace 94+50	-	-	-	-	72	-	-	-	-	-	-	
1199	2N	5806438	Spa Dam 2 Rebuild Radial Gate Cntrl Bldg	-	-	-	-	7	-	-	153	241	365	-	
1200	2N	5806440	South Yuba Pipe Replace Saddles	-	-	-	-	27	-	-	-	-	-	-	
1201	2N	5806441	BRC Sta217+00 Flume Drainage Improvement	-	-	-	-	16	-	-	-	-	-	234	
1202	2N	5806442	Rock Creek Dam Drum Replace Head Gates	-	-	-	-	15	-	-	-	-	468	1,031	
1203	2N	5806443	Lake Valley Canal Replace Lennon Sheet	-	-	-	-	87	-	-	-	-	-	-	
1204	2N	5806445	Fiddler Green Repl Flume 1 Lennon Sheets	-	-	-	-	272	-	-	-	-	-	-	
1205	2N	5806448	Fuller Install New EAP Weir	-	-	-	-	17	-	-	-	-	-	-	
1206	2N	5806779	Relief Dam Install Log Boom	-	-	-	-	-	-	116	48	321	-	-	
1207	2N	5806780	Relief Spillway Impr Lower Training Wall	-	-	-	-	-	-	-	285	688	2,600	2,343	WP 3-381
1208	2N	5806781	Relief Dam U/S Liner Patching 2024	-	-	-	-	392	58	-	-	-	-	-	WP 3-475
1209	2N	5806782	Lower Bear Dam 1 Erosion Protection	-	-	-	-	9	-	-	-	183	676	-	WP 3-475
1210	2N	5806798	Cresta Dam Upgr Drum Gate Indicators	-	-	-	-	33	-	-	-	-	-	-	
1211	2N	5806840	Caribou 2 PH Intake Seismic Improvements	-	-	-	-	18	-	230	285	4,587	-	-	
1212	2N	5806842	DeSabla Dam Install Standby Gen	-	-	-	-	-	-	39	95	367	-	-	
1213	2N	5806844	PV Scott Dam Inst New Log Boom Anchors	-	-	-	-	18	-	46	-	-	-	-	
1214	2N	5807220	Spaulding Dam 1 Replace LLO	-	-	-	33	623	16,031	14,595	20,251	14,476	11,747	539	
1215	2N	5807261	Main Tuolumne 606+50 Spill Erosion Mitg	-	-	-	-	-	-	-	48	-	-	-	
1216	2N	5807262	Main Tuolumne Moores Cross Rplc Culvert	-	-	-	-	-	-	-	48	-	-	-	
1217	2N	5807263	Main Tuolumne Cnl Upgr Ret Wall Sta 731	-	-	-	-	-	-	-	-	-	312	1,125	
1218	2N	5807264	Main Tuolumne Canal Replace N Flume	-	-	-	-	15	-	438	33	-	-	-	
1219	2N	5807266	Electra Penstock AB4 Erosion Protection	-	-	-	-	388	-	-	-	-	-	-	
1220	2N	5807342	Kerckhoff Dam Primary LZ Geo Repairs	-	-	-	-	228	-	-	171	1,173	112	-	
1221	2N	5808006	Rock Cr South Wing Aux Dam Instl Berm	-	-	-	73	339	-	-	-	-	-	-	
1222	2N	5808099	Pit 6 Unit 1 Recoat Intake Gate	-	-	-	-	53	-	-	-	-	-	-	
1223	2N	5808100	Pit 6 Unit 2 Recoat Intake Gate	-	-	-	-	47	-	-	-	-	-	-	
1224	2N	5808141	Kerckhoff Dam Upgrade Comm System	-	-	-	-	16	-	134	285	37	-	-	
1225	2N	5808202	Rock Creek Dam Recoat Drum Gate 2	-	-	-	-	-	1,062	-	-	-	-	-	
1226	2N	5808203	Poe Dam Recoat Bypass Gate	-	-	-	-	48	477	-	-	-	-	-	
1227	2N	5808207	Cresta Dam Recoat Drum Gate 1	-	-	-	-	-	-	776	24	-	-	-	
1228	2N	5808523	YB 116 Remote Control Gate Cncl	-	1	(0)	(0)	-	-	-	-	-	-	-	
1229	2N	5808525	South Canal Liner Improvements	-	-	-	-	1,668	77	-	-	-	-	-	
1230	2N	5808620	Blue Lake Dam Install Log Boom	-	-	-	-	-	-	116	238	229	10	-	
1231	2N	5808621	Kidd Lake Dam Install Log Boom	-	-	-	-	26	-	196	622	5	-	-	
1232	2N	5808622	Drum 2 Intake Gate Excess Flow	-	-	-	-	-	150	155	10	-	-	-	
1233	2N	5808625	Relief Dam Imprv ML S52 StillingWell D/S	-	-	-	-	15	-	-	285	-	-	-	
1234	2N	5808703	Pit 1 Fbay Dam Rep Gates 4 & 5 Chains	-	-	-	-	-	-	-	76	138	624	-	
1235	2N	5808706	Lower Millseat Canal Install Liner	-	-	-	-	-	-	-	-	138	364	469	
1236	2N	5808805	Wishon Dam Recoat Radial Gates GIR	-	-	-	-	-	-	-	71	-	-	-	
1237	2N	5808898	Hat Crk 2 Div Dam Recoat Spillway Bridge	-	-	-	-	18	-	-	-	-	-	-	
1238	2N	5808947	Lyons Dam Retrofit Log Boom	-	-	-	-	104	-	-	-	-	-	-	
1239	2N	5808949	PV Van Arsdale Replace Fish Screens	-	-	-	-	-	-	-	381	734	1,872	-	WP 3-376
1240	2N	5808952	Grizzly Frby Dam Inst Left Side Access	-	-	-	-	-	-	-	-	183	208	703	

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1241	2N	5809953	DeSabla Forebay Repl Trashrake & Grizzly	-	-	-	-	-	5	-	-	-	-	-	-
1242	2N	5809954	LA Canyon Dam Upgr Seepage Collection Sy	-	-	-	-	-	-	-	-	143	183	1,040	-
1243	2N	5809963	PV Replace Primary Bypass Valve	-	-	-	-	139	544	-	-	-	-	-	-
1244	2N	5809060	Courtright - Dam Concrete Liner Repairs	-	-	-	-	5,690	280	-	-	-	-	-	-
1245	2N	5809125	South Yuba Pipe Replacement	-	-	-	-	11,200	75	-	-	-	-	-	-
1246	2N	5809281	MTC Repl 282+00-290+50GniteBox/New Liner	-	-	-	-	-	-	-	-	321	-	-	-
1247	2N	5809438	Wise FB Abutment Erosion Protection Inst	-	-	-	-	516	-	-	-	-	-	-	-
1248	2N	5809441	Kelly Lake Dam Replace Log Boom	-	-	-	-	-	-	116	238	229	10	-	-
1249	2N	5809442	Spaulding LLO Diversion South Yuba Cnl	-	-	-	-	138	-	1,307	23	-	-	-	-
1250	2N	5809570	Hat 1 Penstock Footing Repair	-	-	-	-	-	-	-	143	229	312	47	
1251	2N	5809571	Hat 2 Penstock Erosion Control	-	-	-	-	-	-	-	57	-	-	-	
1252	2N	5809663	Lyons Dam Restore Toe Void	-	-	-	-	238	-	72	710	18	-	-	WP 3-475
1253	2N	5809760	Hat 2 PH Canal Refurbish Spillway Chute	-	-	-	-	-	-	-	143	183	416	70	
1254	2N	5809987	Strawberry LLO Replace Rockfall Netting	-	-	-	-	-	-	-	143	183	-	-	WP 3-475
1255	2N	5809988	Strawberry Intake Tower Guide Valve Ripc	-	-	-	-	-	-	155	238	-	-	-	
1256	2N	5809989	Electra Penstock Inst Erosion Protection	-	-	-	-	-	-	-	333	-	-	-	
1257	2N	5810106	Philadelphia 3 Flume Lining 2024	-	-	-	-	445	-	-	-	-	-	-	
1258	2N	5810725	Tiger Crk Canal Rest Fdn & Erosion Prot	-	-	-	-	-	-	-	-	229	780	-	
1259	2N	5810849	Spaulding Dam 2 Recoat Radial Gates GIR	-	-	-	-	808	-	-	-	-	-	-	
1260	2N	5810998	Spaulding 1 Tailrace Imprv Dewtr Access	-	-	-	-	71	-	-	-	-	-	-	
1261	2N	5811070	Rock Creek Dam Repl IFR and Guard Valves	-	-	-	-	7	-	621	-	-	-	-	
1262	2N	5811071	Poe Dam Trunnion Keeper Plate Bolts Repl	-	-	-	-	-	-	78	951	28	-	-	
1263	2N	5811074	Hendricks Canal Lining Improvements	-	-	-	-	-	-	-	2,054	1,835	2,080	1,874	
1264	2N	5811969	Pit 3 PH Replace PSV 1, 2 & 3	-	-	-	-	-	-	-	-	-	-	843	
1265	2N	5811970	South Replace Penstock	-	-	-	-	-	-	-	-	-	-	281	
1266	2N	5811973	Iron Cayon Dam Inst Instru ADAS	-	-	-	-	-	-	-	-	-	-	234	
1267	2N	5811974	Pit 7 Dam Inst Instru ADAS	-	-	-	-	-	-	-	-	-	-	234	WP 3-463
1268	2N	5811975	Pit 1 Dam Inst Instru ADAS	-	-	-	-	-	-	-	-	-	-	234	WP 3-463
1269	2N	5811976	Pit 6 Dam Inst Instru ADAS	-	-	-	-	-	-	-	-	-	-	234	WP 3-463
1270	2N	5812023	Wise Fbay Upgrade Trash Rake Controls	-	-	-	-	-	-	-	-	138	156	187	
1271	2N	5812024	BRC Franklin Replace Trash Rack	-	-	-	-	-	-	-	-	92	104	234	
1272	2N	5812025	2029 Annual Canal Liner Improvements	-	-	-	-	-	-	-	-	-	3,121	28	
1273	2N	5812026	2030 Annual Canal Liner Improvements	-	-	-	-	-	-	-	-	-	-	2,811	
1274	2N	5812027	YB139 Install Backup Generator	-	-	-	-	-	-	-	143	229	26	-	
1275	2N	5812028	South Cnl STA 206 Embk Slope Protection	-	-	-	-	-	-	-	143	505	26	-	
1276	2N	5812030	Drum U1 & U2 Tailrace Install Liner	-	-	-	-	-	-	-	-	-	156	281	
1277	2N	5812031	Lake Valley LLO DS Channel Improvements	-	-	-	-	-	-	-	-	-	156	94	
1278	2N	5812032	Drum Canal Tahoe Spill Inst Erosion Prot	-	-	-	-	-	-	-	-	-	156	94	
1279	2N	5812035	BRC 7/1 Flume Replacement	-	-	-	-	-	-	78	951	18	-	-	
1280	2N	5812036	Alta Forebay Inlet Improvements	-	-	-	-	-	-	-	-	-	-	281	
1281	2N	5812059	Drum YB 73 Valve Automation	-	-	-	-	-	-	-	-	138	104	375	
1282	2N	5812060	Wise PH Recoat Penstock	-	-	-	-	-	-	-	-	-	-	117	
1283	2N	5812061	Wise PH Replace PSV	-	-	-	-	-	-	-	-	138	312	375	
1284	2N	5812062	Lower Peak Dam Replace LLO & Valves	-	-	-	-	-	-	-	-	275	2,080	1,874	
1285	2N	5812063	Halsey PH Replace Penstock	-	-	-	-	-	-	-	-	-	-	937	
1286	2N	5812064	Drum 1 Replace Penstock 1	-	-	-	-	-	-	-	-	-	-	469	
1287	2N	5812065	Bear River Canal Replace Liner	-	-	-	-	-	-	-	-	-	-	2,999	
1288	2N	5812066	Drum Rock Creek Canal Replace Liner	-	-	-	-	-	-	-	-	-	-	197	
1289	2N	5812067	Drum South Canal Replace Liner	-	-	-	-	-	-	-	-	-	-	609	
1290	2N	5812068	Middle Fiddler Green Replace Liner	-	-	-	-	-	-	-	-	-	-	562	
1291	2N	5812069	Drum Canal Replace Liner	-	-	-	-	-	-	-	-	-	-	937	
1292	2N	5812070	Lake Valley Canal Replace Liner	-	-	-	-	-	-	-	-	-	-	703	
1293	2N	5812071	Towle Canal Replace Liner	-	-	-	-	-	-	-	-	-	-	750	
1294	2N	5812072	Wise Penstock Geotechnical Hardening	-	-	-	-	-	-	-	-	-	-	656	
1295	2N	5812073	South Yuba Canal Geotechnical Hardening	-	-	-	-	-	-	-	-	-	-	656	
1296	2N	5812074	Spaulding Dam 2 Rplc Gate Hoist 8 -10	-	-	-	-	-	-	-	-	-	780	1,406	
1297	2N	5812075	Lower Peak Dam Install Log Boom	-	-	-	-	-	-	-	48	138	1,040	-	
1298	2N	5812076	Upper Peak Dam Install Log Boom	-	-	-	-	-	-	-	-	-	-	47	
1299	2N	5812077	Rucker Lake Dam Install Log Boom	-	-	-	-	-	-	-	-	-	-	70	
1300	2N	5812078	Fuller Lake Dam Seismic Retrofit	-	-	-	-	-	-	-	-	-	-	703	
1301	2N	5812079	Lower Peak Seismic Retrofit	-	-	-	-	-	-	-	-	-	-	703	
1302	2N	5812081	Kelly Lake Dam Crest Restoration	-	-	-	-	-	-	-	143	229	26	-	

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1303	2N	5812082	Spaulding 3 Aux Spillway Inst Log Boom	-	-	-	-	-	-	116	143	23	-	-	
1304	2N	5812083	Spaulding 2 Dam Rock Anchorage	-	-	-	-	-	-	-	143	92	260	14	WP 3-381
1305	2N	5812084	Drum Lower Rock Dam Replace LLO Pipe	-	-	-	-	-	-	78	95	275	16	-	
1306	2N	5812085	Drum Lower Peak Spillway Channel Imprv	-	-	-	-	-	-	78	285	917	26	-	
1307	2N	5812087	South Yuba Canal YB244 Shotcrete	-	-	-	-	-	-	-	-	110	832	-	
1308	2N	5812088	Bear River Canal Instrumentation Upgrade	-	-	-	-	-	-	-	-	229	2,080	1,874	
1309	2N	5812095	Strawberry Inflow Gauging STA	-	-	-	-	-	-	78	285	-	-	-	
1310	2N	5812098	Relief Dam U/S Liner Patching 2026	-	-	-	-	-	-	621	-	-	-	-	WP 3-475
1311	2N	5812099	Relief Dam U/S Liner Patching 2027	-	-	-	-	-	-	-	761	-	-	-	WP 3-475
1312	2N	5812101	Lower Bear Intake Gate motor replacement	-	-	-	-	-	-	233	-	-	-	-	
1313	2N	5812102	Meadow Lake 24" LLO Guard Valve Replace	-	-	-	-	-	-	-	238	-	-	-	
1314	2N	5812112	Main Tuolomne Canal Replace Liner	-	-	-	-	-	-	-	-	-	-	2,155	
1315	2N	5812184	Crane Valley Dam Replace Needle Valve	-	-	-	-	-	-	-	-	-	-	703	
1316	2N	5812200	Helms - Wishon Dam Replace HB Valve	-	-	-	-	-	-	-	-	-	-	703	
1317	2N	5812248	Belden Dam Repl Radial Gates Hoist	-	-	-	-	-	-	-	-	-	780	2,811	
1318	2N	5812249	Belden Intk & Pnstk Upgr Gate Ex Flow Pr	-	-	-	-	-	-	78	285	459	-	-	
1319	2N	5812250	Belden Penstock 2023 Improvements	-	-	-	-	-	-	-	-	92	260	562	
1320	2N	5812252	Belden Siphon Repl Joint No. 4 Gasket	-	-	-	-	-	-	-	95	138	1,812	71	
1321	2N	5812319	Cresta Dam Inst Instru ADAS	-	-	-	-	-	-	-	-	-	-	234	WP 3-463
1322	2N	5812320	Cresta Dam Restore LLO & Dredge	-	-	-	-	-	-	-	143	183	208	469	
1323	2N	5812324	Lake Almanor Dam Intake Tower Retrofit	-	-	-	-	-	-	-	238	229	1,560	4,217	
1324	2N	5812325	Lake Almanor LLO Retrofit Disc Structure	-	-	-	-	-	-	-	-	-	-	234	
1325	2N	5812326	Lower Bucks Dam Abandon Intake Tower	-	-	-	-	-	-	-	-	-	-	469	
1326	2N	5812327	Lower Bucks Replace NF82 Flowmeter	-	-	-	-	-	-	116	285	-	-	-	
1327	2N	5812328	Philbrook Dam Inst Instru ADAS	-	-	-	-	-	-	-	-	-	-	234	WP 3-463
1328	2N	5812331	Rock Creek Dam Inst Instru ADAS	-	-	-	-	-	-	-	-	-	-	234	WP 3-463
1329	2N	5812332	Rock Creek Dam Restore LLO & Dredge	-	-	-	-	181	-	-	143	183	208	469	
1330	2N	5812379	Rock Creek Dam Inst Cofferdam Baseplates	-	-	-	-	0	-	-	-	-	-	-	
1331	2N	5812668	Kerckoff Dam Rplc Spillway Gates 10 -14	-	-	-	-	-	-	-	143	413	3,121	6,560	
1332	**2N**	**2N Total**		**45,193**	**27,576**	**38,066**	**46,960**	**102,324**	**88,716**	**79,164**	**71,234**	**98,012**	**82,959**	**105,377**	Sum of Lines 942-1331
1333	**2N**														
1334	2P	5501073	DeSabla Inst/Repl Buildngs, Grnds, Infra	806	7	(0)	668	943	200	171	230	244	305	302	
1335	2P	5501077	Drum Inst/Repl Buildngs, Grnds, Infra	169	1,861	548	125	16	200	171	230	244	305	302	
1336	2P	5510814	Shasta Inst/Repl Buildngs, Grnds, Infra	-	5	8	270	314	200	171	230	244	305	302	
1337	2P	5511185	MLode Inst/Repl Buildngs, Grnds, Infra	16	366	7	90	-	-	171	230	244	305	302	
1338	2P	5559030	Helms Inst/Rep Buildings, Grnds, Infra	-	-	-	-	-	-	171	230	244	305	302	
1339	2P	5559032	KCV Inst/Repl Buildings, Grnds, Infra	-	-	-	-	-	-	171	230	244	305	302	
1340	2P	5741178	Caribou Road Capital Improvements	8	(0)	-	-	-	-	-	-	-	-	-	
1341	2P	5747185	Butt Valley Replace VH Bridge	49	85	2,529	383	-	-	-	-	-	-	-	
1342	2P	5747209	Drum 1 PH -- Crane 1 Modifications	0	-	-	-	-	-	-	-	-	-	-	
1343	2P	5747224	Electra Upgrade Valve House	104	-	-	-	-	-	-	-	-	-	-	
1344	2P	5753758	Helms - Crane Upgrades/Replacement	364	2	-	-	-	-	-	-	-	-	-	
1345	2P	5754972	Pit 3 Repl Upper Roof & Fall Protection	19	355	9	-	-	-	-	-	-	-	-	
1346	2P	5757638	Auberry - Replace Main Office Cubicles	-	25	-	-	-	-	-	-	-	-	-	
1347	2P	5760039	Bucks Creek PH Upgrade Cranes	5,611	50	192	22	36	-	-	-	-	-	-	
1348	2P	5760048	Caribou 1 PH Upgrade Crane	367	20	4	-	-	-	-	-	-	-	-	
1349	2P	5760289	Pit 5 PH Access Road Bridge Installation	243	2,758	27	-	-	-	-	-	-	-	-	
1350	2P	5760678	Dutch Flat 1 PH Roof Replace	(5)	-	-	-	-	-	-	-	-	-	-	
1351	2P	5766140	Pit 1 Replace Roof Over 11kV Switchgear	14	446	799	1,339	43	-	-	-	-	-	-	
1352	2P	5766141	JBB Install TWD Shelters and Containment	1	-	-	-	-	-	-	-	-	-	-	
1353	2P	5766459	Haas - Replace PH Water Supply Tank	370	20	-	-	-	-	-	-	-	-	-	
1354	2P	5768005	Manton SC Replace Fueling Island	441	122	-	-	-	-	-	-	-	-	-	
1355	2P	5768006	Manton SC Resurface Parking Lots	-	727	24	-	-	-	-	-	-	-	-	
1356	2P	5770038	Helms - Install HQ Leachfield	49	46	45	107	61	-	1,708	31	-	-	-	
1357	2P	5772625	Balch - Install Warehouse	1	(19)	-	-	-	-	-	-	-	-	-	
1358	2P	5772937	West Point Valve House Access Rd Improve	131	216	-	-	-	-	-	-	-	-	-	
1359	2P	5773742	Pit 6 Road Storm Damage Jan 2017 Capital	(407)	(320)	-	-	-	-	-	-	-	-	-	
1360	2P	5773858	Butte Head Dam Rd Improve 2017	-	8	-	-	-	-	-	-	-	-	-	
1361	2P	5774078	Pit 5 PH Road 2017 Storm Damage Capital	(1,157)	(891)	-	-	-	-	-	-	-	-	-	
1362	2P	5774079	Pit 4 PH Road Storm Damage Feb 2017	(336)	(254)	-	-	-	-	-	-	-	-	-	
1363	2P	5774219	Salt Springs Rd Landslide- Panther Grade	(393)	(303)	-	-	-	-	-	-	-	-	-	
1364	2P	5774220	Tiger Ck Canal - Emergency Storm Damage	(285)	(217)	-	-	-	-	-	-	-	-	-	

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1365	2P	5774226	Pit 7 Rd Refurbishment 2017 Storm Damage	(776)	(490)	874	16	-	-	-	-	-	-	-	
1366	2P	5774680	Volta Lk Grace Repl Intake Battery Bldg	4	81	87	19	8	-	38	21	22	114	754	
1367	2P	5774758	Poe Dam Road Improvements	(21)	(36)	-	-	-	-	-	-	-	-	-	
1368	2P	5774854	Oak Flat PH Improve Access Road	(95)	(76)	-	-	-	-	-	-	-	-	-	
1369	2P	5775661	Caribou Road Culvert Installation	(265)	(200)	-	-	-	-	-	-	-	-	-	
1370	2P	5775792	Drum 1 PH -- Crane 2 Modifications	6	-	-	-	-	-	-	-	-	-	-	
1371	2P	5776118	Caribou Rd Stabilization at PH	11	-	-	-	-	-	-	-	-	-	-	
1372	2P	5776830	Pit 5 PH Surge Chmbr & VH Slide Strm Dmg	(558)	(430)	-	-	-	-	-	-	-	-	-	
1373	2P	5777045	Pit 3 Tailrace Brdg Deck Capital Upgrade	(0)	-	-	-	-	-	-	-	-	-	-	
1374	2P	5778048	Haas - Replace Elevator Controls	134	135	63	344	150	1,600	-	-	-	-	-	
1375	2P	5778051	Balch 2 - Emergency Power Backfeed 12kV	(1)	-	-	-	-	-	-	-	-	-	-	
1376	2P	5778055	Dutch Flat Rd Drainage Improvements	9	-	-	-	-	-	-	-	-	-	-	
1377	2P	5778261	Belden Refurbish Adit 1 BR12 Bridge	-	18	23	3	2	-	-	111	528	-	-	
1378	2P	5778262	Rodgers Flat SC Remodel	(5)	-	-	544	431	-	-	-	-	-	-	
1379	2P	5778990	Lake Valley Canal Convert to Pipe	-	-	-	-	-	-	-	-	321	520	3,280	
1380	2P	5779019	Spaulding 3 Pnstk Repl Air Valve Bldgs	-	-	-	-	7	-	-	-	-	-	94	
1381	2P	5779081	Strawberry Dam - Extend HeliPad	380	(1)	-	-	-	-	-	-	-	-	-	
1382	2P	5779082	Relief Dam - Install Concrete HeliPad	1	100	138	1,600	532	-	-	-	-	-	-	
1383	2P	5779398	Drum Penstock Access Improvements	285	1,504	940	7	-	-	-	-	-	-	-	
1384	2P	5779419	Balch 1 Replace Cooling Wtr Tank Control	24	46	118	27	315	-	33	44	1,228	841	-	
1385	2P	5779437	Helms Crane Rail Capacity Uprate	289	118	112	1,603	378	-	-	-	-	-	-	
1386	2P	5779575	Electra PH Crane Modernization	84	3	2	0	0	-	-	-	1,835	2,080	-	
1387	2P	5779576	Tiger Creek PH Crane Modernization	21	53	65	49	86	3,138	454	-	-	-	-	
1388	2P	5779577	Salt Springs PH Crane Modernization	12	1	3	3	2	-	866	2,144	76	-	-	
1389	2P	5780599	Pit 5 Open Conduit Replace Building	204	41	26	22	70	-	-	-	-	-	-	
1390	2P	5780660	K2 - Replace Stairway	35	146	129	69	379	286	1,116	-	-	-	-	
1391	2P	5783123	Helms Install Backup Power at Portal	196	111	208	1,281	1,852	1,332	790	2,413	4,688	461	-	
1392	2P	5783168	Scott Dam Repl Standby Generator	0	-	-	-	-	-	-	-	-	-	-	
1393	2P	5783343	Spring Gap Bunk Inst Wiring & Lighting	5	-	-	-	-	-	-	-	-	-	-	
1394	2P	5783415	Poe PH Road Slide 2018	20	-	-	-	-	-	-	-	-	-	-	
1395	2P	5783487	Cresta PH Road Mitigate Erosion	5	-	-	-	-	-	-	-	-	-	-	
1396	2P	5783518	Cresta VH Road Install Culvert	7	-	-	-	-	-	-	-	-	-	-	
1397	2P	5784998	Cow Creek Restore 03/NO71 Access Bridge	4	-	-	-	-	-	-	-	-	-	-	
1398	2P	5785093	Pit 3 PH Replace Crane(s) Controls	398	8,280	341	76	-	-	-	-	-	-	-	
1399	2P	5785095	Pit 1 PH Replace Crane(s) Controls	304	6	147	39	52	-	-	-	-	-	-	
1400	2P	5786368	Balch 1 - Replace Penstock Inspec Bridge	15	-	-	-	-	-	-	-	-	-	-	
1401	2P	5786858	Rock Creek VH Replace Roof	275	742	429	6,218	209	-	-	-	-	-	-	
1402	2P	5786881	Drum 2/Common Gantry Crane Refurbish	24	(23)	5	3	1	-	467	656	-	-	-	
1403	2P	5786900	Helms - Rplc Suprt Fac Back Up Generator	14	47	167	857	898	-	-	-	-	-	-	
1404	2P	5787559	Drum Cranes 1 & 2 Aux Hoist Installs	14	407	149	180	271	-	-	-	-	-	-	
1405	2P	5787738	Poe PH SS Rock Slide Mitigate Erosion	121	35	1	18	43	-	-	20	20	1,049	-	
1406	2P	5787994	Haskins CG Repl Boat Ramp	181	1,517	90	-	-	1,243	23	-	-	-	-	
1407	2P	5788189	Pit 3 Rock Creek Bridge Replace Deck	31	156	511	505	-	-	-	-	-	-	-	
1408	2P	5788229	Bridge M05 Install Guard Rail & Widen Rd	113	-	-	-	-	-	-	-	-	-	-	
1409	2P	5788236	Stanislaus FB Instl Alt Power	126	93	31	252	212	-	1,312	-	-	-	-	
1410	2P	5789800	Tiger Creek-Repl Company Houses Roofs	147	-	-	-	-	-	-	-	-	-	-	
1411	2P	5791558	Haas – Upgrade Crane Controls	55	149	65	19	10	0	55	566	3,707	-	-	
1412	2P	5792458	Pit 4 PH Upgrade Crane(s)	-	-	96	(4)	7	-	2,525	5,285	-	-	-	
1413	2P	5792540	Stanislaus FB Instl Communication Path	-	3	0	0	0	-	-	-	-	-	-	
1414	2P	5792559	Plt 6 Replace Lighting System	-	-	-	-	-	-	-	-	202	-	-	
1415	2P	5792560	JBB Replace Lighting System	-	-	-	-	167	-	-	-	-	-	-	
1416	2P	5792563	JBB Willow Creek Rd Stabilization	-	1	170	27	184	401	5,749	95	-	-	-	
1417	2P	5792584	Pit 3 Repave Road	-	-	31	422	229	-	4,203	95	-	-	-	
1418	2P	5792694	Lower Lindsey Dam Install Handrail	-	19	16	70	600	-	-	-	-	-	-	
1419	2P	5792718	Meadow Lake Dam Upgrade Power Source	-	58	284	27	-	-	-	-	-	-	-	
1420	2P	5792720	Lower Blue Lake Dam Upgrade Power Source	-	93	89	312	(1)	-	-	-	-	-	-	
1421	2P	5792721	Upper Blue Lake Dam Upgrade Power Source	-	51	64	233	(1)	-	-	-	-	-	-	
1422	2P	5792736	Drum Canal YB36 Gaug Sta Improve Access	-	39	85	63	287	-	-	-	-	-	-	
1423	2P	5792739	Spaulding Housing Septic Line Rpl	-	113	-	-	-	-	-	-	-	-	-	
1424	2P	5792746	Balch Remodel Lodging Facility	-	647	15	-	-	-	-	-	-	-	-	
1425	2P	5792747	Helms Remodel Lodging Facility	-	-	181	28	-	-	-	-	-	-	-	
1426	2P	5792748	Kerckhoff Dam Repl Stairway to IFR	-	106	262	1,491	1,246	-	-	-	-	-	-	

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1427	2P	5792749	Helms - Replc Swtchyard Gen Fuel System	-	160	100	-	-	-	-	-	-	-	-	
1428	2P	5792758	Caribou 1 Way Rd Resurfacing	-	-	-	536	-	-	-	-	-	-	-	
1429	2P	5792759	Caribou Rd PNF Rd 27N26 Mitigate Erosion	-	94	224	135	66	-	-	-	-	-	-	
1430	2P	5792948	Helms PH Install Second Story Offices	-	-	-	-	65	-	577	-	-	-	-	
1431	2P	5792949	Helms Replace Access Tunnel Lighting	-	-	-	3	295	-	-	-	-	-	-	
1432	2P	5792952	Kerckchoff Dam Install Access Road	-	-	-	-	-	-	-	-	115	260	703	
1433	2P	5793579	SYC YB139 Replace Cross Gate Limitorque	-	-	-	-	-	-	241	14	-	-	-	
1434	2P	5793583	Spaulding 1 Install Backup Gen (PSPS)	-	-	-	-	-	-	-	-	367	1,040	94	
1435	2P	5793611	Spaulding Road Repave Access Road	-	-	-	782	-	-	-	-	-	-	-	
1436	2P	5793612	Spaulding Lumber Yard Install Snow Cover	-	-	-	132	1,049	1,246	-	-	-	-	-	
1437	2P	5793614	Lake Valley Propane Install Snow Cover	-	-	-	-	-	-	124	10	-	-	-	
1438	2P	5793617	Alta SC Replace Failed Asphalt	-	-	-	-	17	-	0	-	-	-	-	
1439	2P	5795558	Halsey Crane Modifacations	0	-	-	-	-	-	-	-	-	-	-	
1440	2P	5796184	Tiger Creek Dorms Refurbishment HVAC	-	108	197	-	-	-	-	-	-	-	-	
1441	2P	5796498	Haas – Sawmill Flat Rd Instl Culvert	-	8	201	292	172	858	-	-	-	-	-	
1442	2P	5796641	Helms - Upgr Drinking Water System	-	38	212	238	22	-	-	-	-	-	-	
1443	2P	5797518	Balch PH Road Improvements	-	289	938	-	-	-	-	-	-	-	-	
1444	2P	5797658	Pit 5 Surge Chmbr & VH Sld Stabilization	-	10	293	316	319	4,126	-	-	-	-	-	
1445	2P	5798298	Panther Creek Erosion Control Protection	-	48	123	453	4	-	-	-	-	-	-	
1446	2P	5798384	Helms - Stabilize Xfmr Gallery Ceiling	-	-	5	95	79	-	-	130	713	2,361	45	
1447	2P	5798498	Pit 3 Rock Crk Bridge Upgr Footing	-	-	343	28	-	-	-	-	-	-	-	
1448	2P	5798499	Pit 3 Tailrace Bridge Refb Pier Voids	-	-	1	1	13	-	39	7,191	92	-	-	
1449	2P	5798560	Pit 3 Britton Dam Brdg Concrete Upgr	-	-	5,175	25	2	-	-	-	-	-	-	
1450	2P	5799078	Pit 5 PH Road Improvements	-	7	64	78	341	-	78	-	-	-	-	
1451	2P	5799079	Pit 6 PH Road Improvements	-	7	72	65	241	-	78	-	-	-	-	
1452	2P	5799114	Camp 9 Road Stan PH Improvements	-	8	113	37	397	-	-	-	-	-	-	
1453	2P	5799116	Drum PH Road Improvement	-	6	144	53	983	-	-	-	-	-	-	
1454	2P	5799117	YB198 Gauging Improve Slope Protection	-	-	-	-	-	-	-	-	-	104	70	
1455	2P	5801298	Helms - Replace PH Elevator Controls	-	-	11	401	2	-	-	-	-	-	-	
1456	2P	5801421	K2 Crane Buss Support Replace	-	-	465	186	-	-	-	-	-	-	-	
1457	2P	5801422	Balch Remodel House 5383	-	-	305	32	-	-	-	-	-	-	-	
1458	2P	5801440	Helms Remodel Records-Comm Office	-	-	-	190	76	-	-	-	-	-	-	
1459	2P	5801498	Helms PSP Improve Lighting	-	-	0	34	485	-	-	-	-	-	-	
1460	2P	5801578	Helms HQ Woodchuck Generator Connection	-	-	-	-	212	1,000	1,440	71	-	-	-	WP 3-247
1461	2P	5801920	Spring Gap Replace Penstock Air Valves	-	-	-	76	79	-	-	-	-	-	-	
1462	2P	5801921	Stanislaus Replace Penstock Air Valves	-	-	-	182	560	-	-	-	-	-	-	
1463	2P	5802278	Balch Remodel House 5376 Smith	-	-	-	70	179	-	-	-	-	-	-	
1464	2P	5802279	Balch Remodel House 6368	-	-	-	-	-	-	-	357	-	-	-	
1465	2P	5802280	Balch - House 6370 (Peach)	-	-	-	98	271	-	-	-	-	-	-	
1466	2P	5802578	Cedar Mill Property Purchase Motherlode	-	-	75	483	2,279	-	-	-	-	-	-	
1467	2P	5802618	Helms – Upgrade Propane Meter System	-	-	-	55	364	-	-	-	-	-	-	
1468	2P	5802624	Salt Springs Rd Stabilizing Wall	-	-	-	414	-	-	-	-	-	-	-	
1469	2P	5802801	Balch – Remodel House 6537 (Lindler)	-	-	-	275	3	-	-	-	-	-	-	
1470	2P	5802824	Wise PH Instl Domestic Water Connection	-	-	-	65	379	-	-	-	-	-	-	
1471	2P	5802900	Helms - Remodel House 7974 (Seder)	-	-	-	0	288	-	-	-	-	-	-	
1472	2P	5802901	Helms Remodel House 8533	-	-	-	226	2	-	-	-	-	-	-	
1473	2P	5802902	Helms Remodel House 8537	-	-	-	18	40	-	-	-	-	-	-	
1474	2P	5802903	Helms Remodel House 8538	-	-	1	279	-	-	-	-	-	-	-	
1475	2P	5802906	Kerckhoff 2 Crane Overhaul	-	-	-	-	82	-	26	82	-	-	-	
1476	2P	5802907	Upper Wise Canal Install Osage Ln Bridge	-	-	-	100	31	-	-	-	-	-	-	
1477	2P	5803078	Balch PH Storage Facility	-	-	-	-	1	-	-	-	-	-	-	
1478	2P	5803559	Helms Large Dorm Remodel Bathroom	-	-	-	-	266	-	-	-	-	-	-	
1479	2P	5803882	Drum Penstock Access Imprv 2023	-	-	-	636	7	-	-	-	-	-	-	
1480	2P	5804259	Pit 3 PH Install Parking Lot Awning	-	-	-	-	-	-	-	-	46	125	294	
1481	2P	5804260	West Point PH Upgr Sump & Oil Detection	-	-	-	-	1	-	591	-	-	-	-	
1482	2P	5804261	Balch 1 Rplc 115kv Switching Structure	-	-	-	-	68	-	193	3,159	624	-	-	
1483	2P	5804658	Tiger Creek Leach Field Install	-	-	-	81	809	-	-	-	-	-	-	
1484	2P	5804719	Helms - House 8526 (Neff)	-	-	-	217	2	-	-	-	-	-	-	
1485	2P	5804720	Helms Remodel House 8522	-	-	-	236	2	-	-	-	-	-	-	
1486	2P	5804722	Balch Garage 6919 Improvements	-	-	-	119	-	-	-	-	-	-	-	
1487	2P	5805002	Spring Gap Replace Water System	-	-	-	3	621	-	-	-	-	-	-	
1488	2P	5805005	Balch Remodel House 5375	-	-	-	68	173	-	-	-	-	-	-	

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1489	2P	5805318	West Pt Inst Security Gate Repave Road	-	-	-	110	252	-	-	-	-	-	-	
1490	2P	5805398	DeSabla PH Road Improvements	-	-	-	860	3,136	1,500	-	-	-	-	-	
1491	2P	5805439	Spaulding Remodel Cabin 1	-	-	-	365	-	-	-	-	-	-	-	
1492	2P	5805444	Butt Valley PH Drainage Improvements	-	-	-	-	37	-	364	-	-	-	-	
1493	2P	5805500	Spaulding Remodel Cabin 2	-	-	-	312	-	-	-	-	-	-	-	
1494	2P	5805518	Helms McKinley Grove Road Imprv	-	-	-	7,006	-	-	-	-	-	-	-	
1495	2P	5805724	Salt Springs Rd 2.3 & 9.9 Imprv	-	-	-	35	208	-	-	-	-	-	-	
1496	2P	5805725	Cresta PH Replace Tailrace	-	-	-	32	384	-	1,300	57	-	-	-	
1497	2P	5805958	Helms DWP and Sump Pump Imprv	-	-	-	185	238	1,387	142	1,133	-	-	-	
1498	2P	5805959	Cole Creek Moke 10 Bridge Retaining Wall	-	-	-	-	5	-	-	-	-	-	-	
1499	2P	5805966	Pit 5 Camp Renovate Employee Housing Fac	-	-	-	-	10	-	-	-	-	-	1,968	
1500	2P	5806039	Helms Hardwire Temp Gen Disconnects 2	-	-	-	21	26	-	-	-	-	-	-	
1501	2P	5806220	Auburn Regional SC - Power Gen Command C	-	-	-	999	1,024	-	-	-	-	-	-	
1502	2P	5806264	Caribou Road Improvements 2023	-	-	-	3,985	4,883	60	-	-	-	-	-	WP 3-386
1503	2P	5806358	KR 2023 Storm Damage Improvements	-	-	-	1	74	248	2,673	-	-	-	-	WP 3-304
1504	2P	5806418	Balch – House 6369	-	-	-	3	0	-	272	-	-	-	-	
1505	2P	5806439	Upper Wise Canal Inst Airport Access Rd	-	-	-	-	29	-	-	-	-	-	-	
1506	2P	5806444	BRC YB50 Install Standby Generator	-	-	-	-	18	-	-	-	-	364	609	
1507	2P	5806451	Bucks Dam Spillway Improve Bridge BR18	-	-	-	1	79	-	655	68	-	-	-	
1508	2P	5806538	Helms Build New Housing	-	-	-	-	16	-	-	-	-	-	336	
1509	2P	5806539	Helms Single Professional Housing Units	-	-	-	-	71	-	-	-	-	-	-	
1510	2P	5806544	Kings River PH - Inst PH Crane	-	-	-	-	16	-	-	-	-	-	1,125	
1511	2P	5806583	Haas Battery Room Install Fans	-	-	-	-	16	-	-	-	229	260	-	
1512	2P	5806585	Balch Battery Room Install Fans	-	-	-	-	14	-	-	-	459	780	47	
1513	2P	5806618	Auberry SC Inst Fuel Island for PSPS	-	-	-	-	-	-	-	-	-	130	234	
1514	2P	5806619	Auberry SC Upgrade Shop HVAC	-	-	-	-	15	250	192	-	-	-	-	
1515	2P	5806703	Automation QA System	-	-	-	236	828	-	-	-	-	-	-	
1516	2P	5806718	Helms – Remodel House 8525	-	-	-	235	109	-	-	-	-	-	-	
1517	2P	5806800	Salt Springs Dam Rd Repl Retaining Wall	-	-	-	-	6	-	-	476	-	-	-	
1518	2P	5806801	Twin Lake Spillway Replace Access Bridge	-	-	-	-	14	-	78	95	275	-	-	
1519	2P	5806838	Belden PH Replace Jib Crane	-	-	-	-	14	-	-	-	-	-	-	
1520	2P	5806839	Caribou 2 PH Rest Battery Room CMU Walls	-	-	-	-	38	-	386	71	-	-	-	
1521	2P	5806859	Balch Remodel Historic HQ 6734	-	-	-	-	44	-	34	629	-	-	-	
1522	2P	5806864	Balch Remodel House 6601	-	-	-	34	57	-	-	-	-	-	-	
1523	2P	5806867	Balch - New Office 9024	-	-	-	-	-	-	-	381	-	-	-	
1524	2P	5806868	Balch Remodel Guest House 5368	-	-	-	-	100	-	-	-	-	-	-	
1525	2P	5806869	Helms Remodel House 6381	-	-	-	-	-	-	-	381	-	-	-	
1526	2P	5806871	Helms Remodel House 7971	-	-	-	-	-	-	-	404	-	-	-	
1527	2P	5806872	Helms Remodel House 7972	-	-	-	-	-	-	-	404	-	-	-	
1528	2P	5806873	Helms Remodel House 7973	-	-	-	-	-	-	-	404	-	-	-	
1529	2P	5806874	Helms Remodel House 7975	-	-	-	-	-	-	-	404	-	-	-	
1530	2P	5806876	Helms Remodel House 8529	-	-	-	-	-	-	-	404	-	-	-	
1531	2P	5807138	Balch Camp WaterTreatment Repl PLC	-	-	-	-	227	-	-	-	-	-	-	
1532	2P	5807270	Tiger Creek Forebay Install Comm Conduit	-	-	-	-	-	-	233	-	-	-	-	
1533	2P	5807273	Salt Springs Repave Panther Creek Road	-	-	-	-	-	-	-	-	-	312	1,406	
1534	2P	5807275	Salt Springs Reg Bridge Repave Road	-	-	-	-	-	-	-	-	-	520	-	
1535	2P	5807423	Drum 1 Replace Weather Station	-	-	-	5	25	-	415	-	-	-	-	
1536	2P	5807801	Helms House 7972 - 1st Floor Remodel	-	-	-	-	125	-	-	-	-	-	-	
1537	2P	5807802	K2 Replace Generator CTs	-	-	-	-	-	-	233	-	-	-	-	
1538	2P	5807867	Balch Backup Generator Inst House 6535	-	-	-	15	21	-	-	-	-	-	-	
1539	2P	5807898	Balch Backup Generator Inst House 6601	-	-	-	16	24	-	-	-	-	-	-	
1540	2P	5807899	Balch Backup Generator Inst House 6537	-	-	-	16	21	-	-	-	-	-	-	
1541	2P	5807900	Balch Backup Generator Inst House 6668	-	-	-	16	19	-	-	-	-	-	-	
1542	2P	5807901	Balch Backup Generator Inst House 5389	-	-	-	16	22	-	-	-	-	-	-	
1543	2P	5807902	Balch Backup Generator Inst House 5383	-	-	-	16	24	-	-	-	-	-	-	
1544	2P	5807903	Balch Backup Generator Inst House 5381	-	-	-	16	26	-	-	-	-	-	-	
1545	2P	5807904	Balch Backup Generator Inst House 9592	-	-	-	15	27	-	-	-	-	-	-	
1546	2P	5807905	Balch Backup Generator Inst House 6368	-	-	-	15	20	-	-	-	-	-	-	
1547	2P	5807906	Balch Backup Generator Inst House 6602	-	-	-	16	20	-	-	-	-	-	-	
1548	2P	5807908	SJ 2 Penstock 2 Repl Two Culv Headwalls	-	-	-	-	28	-	388	48	-	-	-	
1549	2P	5808619	Wise 1 PH Replace Standby Generator	-	-	-	-	-	-	361	19	-	-	-	
1550	2P	5808901	Haas - Comm Room Ventilation Upgrade	-	-	-	-	-	-	-	71	183	52	-	

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1551	2P	5808946	Sand Bar Div Dam Pave Heli Ops Landing	-	-	-	-	-	-	36	281	-	-	-	
1552	2P	5808964	Butt Valley PH Install Walkways	-	-	-	-	-	-	-	-	64	104	375	
1553	2P	5809175	Spaulding Remodel Cabin 3	-	-	-	-	494	-	-	-	-	-	-	
1554	2P	5809240	Balch Camp – Backup Gen House 6370	-	-	-	-	51	-	-	-	-	-	-	
1555	2P	5809460	K2 Install Wtr System for Roof	-	-	-	-	17	-	-	-	-	-	-	
1556	2P	5809539	Balch - House 6699 Remodel (GH2)	-	-	-	-	-	-	142	471	-	-	-	
1557	2P	5809569	Pit 7 Replace Lighting System	-	-	-	-	-	-	-	238	-	-	-	
1558	2P	5809698	Pit 5 PH Road Mitigate Landslide	-	-	-	-	1,199	88	-	-	-	-	-	
1559	2P	5809742	K2 Control Room Ventilation	-	-	-	-	-	-	-	48	-	-	-	
1560	2P	5809818	K2 Battery Room Upgrades	-	-	-	-	30	-	50	-	-	-	-	
1561	2P	5809859	Helms SWYD Build Mezzanine 2nd Floor	-	-	-	-	(0)	-	-	238	459	1,560	70	
1562	2P	5809927	Electra PH Stabilize Substation Slope	-	-	-	-	-	-	-	-	413	-	-	
1563	2P	5810118	Balch - Barracks 6701	-	-	-	-	0	-	-	-	-	-	-	
1564	2P	5810538	Helms House 8530 (Baker)	-	-	-	-	112	-	-	-	-	-	-	
1565	2P	5810642	West Point Upgrade AC/DC Load Center	-	-	-	-	-	-	466	-	-	-	-	
1566	2P	5811072	Caribou SC Remodel	-	-	-	-	-	-	-	809	-	-	-	
1567	2P	5811219	Spaulding Tram Improvments	-	-	-	-	1,012	-	-	-	-	-	-	
1568	2P	5812034	Spaulding PH 3 Trail Improvement	-	-	-	-	-	-	-	-	138	78	281	
1569	2P	5812038	Helms House 8539 Remodel	-	-	-	-	216	-	-	-	-	-	-	
1570	2P	5812158	Helms - House 8524 (Hirtzel)	-	-	-	-	-	-	-	404	-	-	-	
1571	2P	5812183	Balch Remodel House 5377	-	-	-	-	-	-	349	-	-	-	-	
1572	2P	5812246	Dam Safety Camera (HAWC Cameras)	-	-	-	-	-	-	-	-	-	1,560	1,406	WP 3-447
1573	2P	5812247	Hydro Warehouse Design & Installation	-	-	-	-	-	-	-	-	-	-	187	
1574	2P	5812262	Butt Valley Pratville Intk Seismic Imprv	-	-	-	-	-	-	-	-	-	104	234	
1575	2P	5812267	BV Pnstk 2023 Coating & Improvements	-	-	-	-	-	-	-	-	92	260	562	
1576	2P	5812288	Caribou 1 PH Recoat Penstocks	-	-	-	-	-	-	-	76	92	416	-	
1577	2P	5812295	Caribou 2 Crane Upgrade/Replacement	-	-	-	-	-	-	-	190	275	936	1,406	
1578	2P	5812296	Caribou 2 Penstock Geotech Hardening	-	-	-	-	-	-	-	-	-	-	469	
1579	2P	5812297	Caribou 2 Pnstk Upgr Excess Flow System	-	-	-	-	-	-	78	190	459	-	-	
1580	2P	5812299	Tiger Creek Road Repair MP 2.9 Upper Rd	-	-	-	-	-	-	-	190	46	52	656	
1581	2P	5812318	Caribou 2 PH Upgrade Roof	-	-	-	-	-	-	-	71	138	312	937	
1582	2P	5812658	Helms Furnace Replacement - House 7971	-	-	-	-	5	-	-	-	-	-	-	
1583	2P	5812786	Helms Furnace Replacement - House 7972	-	-	-	-	5	-	-	-	-	-	-	
1584	2P	5812787	Helms Furnace Replacement - House 7973	-	-	-	-	5	-	-	-	-	-	-	
1585	2P	5812788	Helms Furnace Replacement - House 7974	-	-	-	-	9	-	-	-	-	-	-	
1586	2P	5812789	Helms Furnace Replacement - House 7975	-	-	-	-	5	-	-	-	-	-	-	
1587	2P	5812790	Helms Furnace Replacement - House 8522	-	-	-	-	5	-	-	-	-	-	-	
1588	2P	5812791	Helms Furnace Replacement - House 8523	-	-	-	-	5	-	-	-	-	-	-	
1589	2P	5812792	Helms Furnace Replacement - House 8524	-	-	-	-	5	-	-	-	-	-	-	
1590	2P	5812793	Helms Furnace Replacement - House 8526	-	-	-	-	5	-	-	-	-	-	-	
1591	2P	5812794	Helms Furnace Replacement - House 8527	-	-	-	-	5	-	-	-	-	-	-	
1592	2P	5812795	Helms Furnace Replacement - House 8528	-	-	-	-	1	-	-	-	-	-	-	
1593	2P	5812796	Helms Furnace Replacement - House 8529	-	-	-	-	5	-	-	-	-	-	-	
1594	2P	5812797	Helms Furnace Replacement - House 8530	-	-	-	-	5	-	-	-	-	-	-	
1595	2P	5812798	Helms Furnace Replacement - House 8531	-	-	-	-	5	-	-	-	-	-	-	
1596	2P	5812799	Helms Furnace Replacement - House 8532	-	-	-	-	5	-	-	-	-	-	-	
1597	2P	5812800	Helms Furnace Replacement - House 8533	-	-	-	-	5	-	-	-	-	-	-	
1598	2P	5812801	Helms Furnace Replacement - House 8534	-	-	-	-	5	-	-	-	-	-	-	
1599	2P	5812802	Helms Furnace Replacement - House 8535	-	-	-	-	5	-	-	-	-	-	-	
1600	2P	5812803	Helms Furnace Replacement - House 8536	-	-	-	-	5	-	-	-	-	-	-	
1601	2P	5812804	Helms Furnace Replacement - House 8537	-	-	-	-	5	-	-	-	-	-	-	
1602	2P	5812805	Helms Furnace Replacement - House 8538	-	-	-	-	5	-	-	-	-	-	-	
1603	2P	5812806	Helms Furnace Replacement - House 8539	-	-	-	-	5	-	-	-	-	-	-	
1604	2P	5812879	Helms Furnace Replacement - House 6381	-	-	-	-	5	-	-	-	-	-	-	
1605	**2P**	**2P Total**		**8,015**	**19,557**	**19,272**	**41,827**	**37,023**	**19,363**	**32,599**	**32,533**	**19,369**	**18,585**	**19,453**	Sum of Lines 1334-1604
1606	**2P**														
1607	3H	5700287	RCC LC: River Water Temp Control	-	-	-	12	-	-	-	-	-	-	-	
1608	3H	5704039	UNFFR FERC 2105 Relicense	2,176	857	505	252	77	655	-	-	-	-	-	
1609	3H	5716718	DeSabla Centerville Relicensing	-	-	122	259	161	396	381	480	-	-	-	
1610	3H	5718898	Battle Cr Salmon Restoration FERC Lic Am	369	371	325	480	536	200	-	-	-	-	-	
1611	3H	5719039	McCloud-Pit FERC 2106 Relicense	1,721	1,013	829	858	756	1,421	-	-	-	-	-	
1612	3H	5719538	Drum Spaulding Relicensing	1,281	691	533	471	361	733	794	953	-	-	-	

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1613	3H	5720508	Drum-Spaulding Lic Cond	-	-	-	-	-	-	-	414	3,176	8,784	13,727	
1614	3H	5720509	Merced Falls FERC 2467 Relicense	(16)	-	-	-	-	-	-	-	-	-	-	
1615	3H	5720686	Bucks Creek FERC 619 Relicense	893	391	398	15	-	-	-	-	-	-	-	
1616	3H	5722537	PoeLC- Rec. Enhancement Plans/ Poe Beach	199	149	389	26	13	-	-	-	-	-	-	
1617	3H	5741498	DeSabla Centerville LC-FishScreen&Ladder	-	-	5	-	-	-	-	-	-	-	-	
1618	3H	5741499	DeSabla Centerville LC-FlowMon&Recording	-	-	15	-	-	-	-	-	-	-	-	
1619	3H	5741503	DeSabla Centerville LC-H2Otemp D forebay	-	-	6	-	-	-	-	-	-	-	-	
1620	3H	5741504	UNFFR LC-Capital Projects	-	-	-	-	-	-	-	65	633	121	149	
1621	3H	5747281	PoeLC-Poe PH Recreation Improvements	96	1,430	389	-	-	-	-	-	-	-	-	
1622	3H	5760695	Kerckhoff 1 &2 Relicensing	4,677	3,003	2,905	1,295	873	1,120	1,260	394	-	-	-	
1623	3H	5760700	Narrows Relicensing	(706)	-	-	-	-	-	-	-	-	-	-	
1624	3H	5760704	Phoenix Relicensing	2,382	1,395	749	164	168	279	57	-	-	-	-	
1625	3H	5760714	Potter Valley Relicensing	66	-	(7,551)	-	-	-	-	-	-	-	-	
1626	3H	5767854	Balch 1 & 2 Relicensing	306	1,409	2,337	3,138	1,621	1,886	1,578	1,375	803	808	-	
1627	3H	5779438	Helms Relicensing FERC #2735	341	2,697	3,670	4,595	2,396	3,036	2,558	2,225	1,695	1,767	-	
1628	3H	5781662	Poe LC- HEA Implementation	-	-	-	-	-	250	1,165	238	229	2,080	586	
1629	3H	5781664	Poe LC Sandy Beach Improvements DOE	61	77	111	222	270	1,433	40	-	-	-	-	
1630	3H	5781666	Poe LC- Poe Reservoir Trail and Signage	48	69	228	346	-	-	-	-	-	-	-	
1631	3H	5781667	Poe LC Bardees Bar Rec & Cult Imp DOE	146	87	105	2,375	33	-	-	-	-	-	-	
1632	3H	5781668	Poe LC- Bardees Bar Drainage Imp & Reveg	44	24	132	39	37	-	-	-	-	-	-	
1633	3H	5781670	PoeLC-Poe Hiking Trail	-	-	10	96	156	851	854	653	98	-	-	WP 3-372
1634	3H	5792732	Rock Creek Rsvr North Fencing - FSI	-	-	-	368	2,740	311	-	-	-	-	-	WP 3-452
1635	3H	5792763	Caribou 1 Install Fencing FSI	-	-	-	-	-	-	-	153	1,343	-	-	
1636	3H	5793127	Hat Creek #1&#2 FERC-2661 Relicensing	-	-	-	-	-	300	414	778	2,557	2,371	1,091	
1637	3H	5794013	Belden Forebay Spillway Improv SAIP	313	412	3	-	-	-	-	-	-	-	-	
1638	3H	5794026	Belden Spillway Fence Replacement SAIP	603	24	-	-	-	-	-	-	-	-	-	
1639	3H	5794027	Butt Valley Spillway Improv SAIP	-	-	-	-	-	-	-	476	1,835	2,080	2,811	WP 3-381
1640	3H	5794029	Halsey Spillway Improvements SAIP	-	-	-	-	11	-	-	-	-	-	-	
1641	3H	5794030	Lake Almanor Spillway Improv SAIP	43	74	381	8	-	-	-	-	-	-	-	
1642	3H	5794031	Lower Bucks Spillway RestorationSAIP DOE	157	461	1,661	1,161	9,121	10,421	194	-	-	-	-	WP 3-381
1643	3H	5794032	McCloud Spillway Improvements SAIP	-	495	1,412	12,176	3,882	4,503	5,696	8,357	104,660	120,235	124,865	
1644	3H	5794034	McCloud Refb Hawkins Cr Rd Upr Slid SAIP	-	160	4,913	1,005	80	-	-	-	-	-	-	
1645	3H	5794035	Tiger Creek Reg Spillway Improv SAIP	1,070	1,085	2,455	2,760	2,127	1,312	26,195	42,197	19,776	7,676	3,701	WP 3-381
1646	3H	5794037	Wise Canal Head Gate Inst Autotrip SAIP	-	137	28	-	-	-	-	-	-	-	-	
1647	3H	5794174	Upper Peak Install Rip Rap SAIP	-	158	1,498	146	8	-	-	-	-	-	-	
1648	3H	5794806	Bucks Storage Spillway Improv SAIP	1,439	27	3	-	-	-	-	-	-	-	-	
1649	3H	5798915	Crane Valley License Amendment	-	-	9	1	0	2,717	3,602	2,568	2,294	1,845	469	
1650	3H	5799154	Pit 1 FB Reinforce Spllwy Chan Wall SAIP	-	-	-	-	1,277	-	-	-	-	-	-	
1651	3H	5800225	Pit 1 Log Boom Repair SAIP	-	-	-	133	525	100	-	-	-	-	-	WP 3-381
1652	3H	5800543	MCPIT-LC Const Iron Cyn Lak Access Sites	-	-	-	-	-	-	-	-	-	138	128	
1653	3H	5800544	MCPIT-LC Construct Gap Creek Campground	-	-	-	-	-	-	-	-	-	1,523	1,403	
1654	3H	5800545	MCPIT-LC Reconstruct Deadlun Campground	-	-	-	-	-	-	-	-	-	1,246	1,148	
1655	3H	5800546	MCPIT-LC Reconstruct Hawkins Boat Launch	-	-	-	-	-	-	-	-	-	1,246	1,148	
1656	3H	5800548	MCPIT-LC Construct Pit 7 Dam Abay Bridge	-	-	-	-	-	-	-	-	-	3,462	9,563	
1657	3H	5800549	MCPIT-LC Recnst Pit 7 Abay Dam Boat Lnch	-	-	-	-	-	-	-	-	-	415	1,148	
1658	3H	5800550	MCPIT-LC Reconstruct Hawkins Campground	-	-	-	-	-	-	-	-	-	692	638	
1659	3H	5800551	MCPIT-LC Construct Iron Canyon Boat Ramp	-	-	-	-	-	-	-	-	-	1,385	1,275	
1660	3H	5800552	MCPIT-LC Const McCloud Dam DUA & Trail	-	-	-	-	-	-	-	-	-	208	191	
1661	3H	5800553	MCPIT-LC Const Star City Crk Camp & DUA	-	-	-	-	-	-	-	-	-	1,731	1,594	
1662	3H	5800554	MCPIT-LC Construct East McCloud Dam DUA	-	-	-	-	-	-	-	-	-	118	108	
1663	3H	5800555	MCPIT-LC Construct West McCloud Dam DUA	-	-	-	-	-	-	-	-	-	118	108	
1664	3H	5800556	MCPIT-LC Construct Battle Creek DUA	-	-	-	-	-	-	-	-	-	111	102	
1665	3H	5800557	MCPIT-LC Construct Red Banks DUA	-	-	-	-	-	-	-	-	-	415	383	
1666	3H	5800561	MCPIT-LC Dev Road Pln	-	-	-	-	-	-	213	267	-	-	-	
1667	3H	5800562	MCPIT-LC Develop Pit 6 Dam Prkg Areas	-	-	-	-	-	-	-	-	-	104	96	
1668	3H	5800563	MCPIT-LC Const Tarantula Gulch Inlet DUA	-	-	-	-	-	-	-	-	-	145	134	
1669	3H	5800564	MCPIT-LC Dev E&S Cntrl and Mgmt Plan	-	-	-	-	-	-	17	22	-	-	-	
1670	3H	5800565	MCPIT-LC Impl Raptor Terr Bio Mgmt & Mon	-	-	-	-	-	-	-	-	122	-	-	
1671	3H	5800566	MCPIT-LC MC-1 Turb Sensor	-	-	-	-	-	-	15	-	-	-	-	
1672	3H	5800567	MCPIT-LC MC-7 Back-up Equip	-	-	-	-	-	-	10	-	-	-	-	
1673	3H	5800568	MCPIT-LC MC-10 Back-up Equip	-	-	-	-	-	-	10	-	-	-	-	
1674	3H	5800569	MCPIT-LC Dev & Impl Sign I&E Mgt Pln	-	-	-	-	-	-	26	32	179	-	-	

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1675	3H	5800598	MCPIT-LC Construct McCloud Rsvr Platform	-	-	-	-	-	-	-	-	-	208	191	
1676	3H	5800599	MCPIT-LC Recnst Tarant Gulch Boat & DUA	-	-	-	-	-	-	-	-	-	2,077	1,913	
1677	3H	5800600	MCPIT-LC Reconstruct Project Roads	-	-	-	-	-	-	-	-	3,585	4,154	7,651	
1678	3H	5800601	MCPIT-LC IMPL Erosion & Sediment Mgt Pln	-	-	-	-	-	-	-	825	1,627	1,885	1,736	
1679	3H	5800602	MCPIT-LC McCloud Dam Improve LLO	-	-	-	-	-	-	1,307	6,811	11,414	13,311	1,308	
1680	3H	5800603	MCPIT-LC MC-7 Gage Improvements	-	-	-	-	-	-	145	182	-	-	-	
1681	3H	5800604	MCPIT-LC MC-10 Gage Improvements	-	-	-	-	-	-	97	121	-	-	-	
1682	3H	5800605	MCPIT-LC Const Pit 7 Rsvr Access Trail	-	-	-	-	-	-	-	-	-	104	96	
1683	3H	5801518	Poe NF 23 Install Temperature Gage	-	-	2	56	-	-	-	-	-	-	-	
1684	3H	5801879	Potter Valley License Surrender	-	-	69	9	38	-	-	-	-	-	-	
1685	3H	5802303	BucksCreek LC Flow Mod Bucks and Lower	-	-	-	-	251	645	-	-	-	-	-	
1686	3H	5802304	BucksCreek LC Bucks Lk Inst Boat-in CG	-	-	-	-	-	-	-	0	-	-	94	
1687	3H	5802305	BucksCreek LC GrizzlyFbayCG Inst Bearbox	-	-	-	1	115	-	-	-	-	-	-	
1688	3H	5802308	BucksCreek LC Bucks PH Access & Signage	-	-	-	-	-	-	-	-	69	208	234	
1689	3H	5802309	BucksCreek LC Lwr BucksLake DUA Recon	-	-	-	-	-	-	162	263	306	1,155	38	
1690	3H	5802310	BucksCreek LC Haskin Valley CG Impvs	-	-	-	-	-	217	233	307	2,142	42	-	
1691	3H	5802311	BucksCreek LC Sandy Pt DUA RMP & TMP Imp	-	-	-	-	15	397	733	143	-	-	-	
1692	3H	5802312	BucksCreek LC Lwr Bucks Lake New DUA	-	-	-	-	-	-	159	258	299	791	37	
1693	3H	5802313	BucksCreek LC GrizzlyFbay RA Repl Restr	-	-	-	4	87	481	-	-	-	-	-	
1694	3H	5802314	BucksCreek LC Lwr Bucks Lake CG Upgr	-	-	-	-	-	-	156	253	294	2,678	37	
1695	3H	5802316	BucksCreek LC SundewCG Repl WtrSys & Rd	-	-	-	38	12	-	-	-	-	-	1,499	
1696	3H	5802317	BucksCreek LC Mill Crk CG RMP & TMP	-	-	-	-	28	131	1,506	87	-	-	-	
1697	3H	5802321	BucksCreek LC Haskins CG Inst Sites&Amp	-	-	-	-	-	-	-	48	92	208	33	
1698	3H	5802323	BucksCreek LC Bucks Lk Shoreline Trl New	-	-	-	-	-	-	78	232	217	940	37	
1699	3H	5802325	BucksCreek LC 3 Lakes Trailhead Barriers	-	-	-	-	-	-	-	0	-	26	141	
1700	3H	5802327	BucksCreek LC WEnd DUA Inst Trl & Prking	-	-	-	-	-	-	-	0	-	226	276	
1701	3H	5802329	BucksCreekLC 3 Lakes Rd 15 Improvs	-	-	-	-	-	-	-	95	217	164	616	
1702	3H	5802330	BucksCreekLC 3 Lakes Rd 15A Improvs	-	-	-	-	-	-	-	95	186	364	1,266	
1703	3H	5802331	BucksCreekLC 3 Lakes Rd 15C Improvs	-	-	-	-	-	-	-	95	186	364	2,897	
1704	3H	5802332	BucksCreekLC Bucks Pnstk Rd Improvs	-	-	-	84	94	184	1,641	-	-	-	-	
1705	3H	5802838	MCPIT-LC Rec Dev & Mgt Plns	-	-	-	-	-	-	42	106	52	-	-	
1706	3H	5802858	'UNFFR LC#Canyon Dam DUA Upgr	-	-	-	-	-	-	31	307	151	847	27	
1707	3H	5802859	UNFFR LC#East Shore CG Fam & RV Upgr	-	-	-	-	-	-	30	464	619	-	-	
1708	3H	5802861	Salmon HEA Implement - UNFFR LC	-	-	-	999	218	750	3,494	713	688	6,241	1,757	
1709	3H	5802883	Caribou 1 Inst Video & Security Upgr FSI	-	-	-	-	-	-	-	243	1,128	28	-	
1710	3H	5802884	Rock Creek PH SC Inst Video&Sec Upgr FSI	-	-	-	12	116	298	8	8	-	-	-	
1711	3H	5802886	Lake Almanor Spillway Install Fence FSI	-	-	-	-	-	150	595	-	-	-	-	WP 3-452
1712	3H	5802888	UNFFR LC#Last Chance CG Upgr & Rec Plan	-	-	-	-	-	-	251	1,355	1,500	36	-	
1713	3H	5802889	UNFFR LC#North Fork Fishing Trail Upgr	-	-	-	-	-	-	-	336	535	-	-	
1714	3H	5804599	Relief Dam Inst V. Surv/Sec Cams FSI	-	-	-	0	1	50	236	837	34	-	-	WP 3-452
1715	3H	5804600	Relief Dam Fencing & Barrier Upgrade	-	-	-	96	784	284	-	-	-	-	-	WP 3-452
1716	3H	5804963	Tiger Crk Reg Dam Inst V.Surv/SecCamsFSI	-	-	-	-	-	-	542	35	-	-	-	WP 3-452
1717	3H	5805018	Tiger Crk ABay Upgr Security Fencing FSI	-	-	-	-	-	-	772	-	-	-	-	WP 3-452
1718	3H	5805019	Tiger Crk Abay Inst V. Surv/Sec Cams FSI	-	-	-	-	-	-	594	-	-	-	-	WP 3-452
1719	3H	5805416	Lake Almanor Spillway Joint Rpl SAIP -ST	-	-	-	251	5,257	4,500	3,882	7,190	6,422	-	-	WP 3-381
1720	3H	5805998	Belden Dam Install Cameras FSI	-	-	-	21	106	212	135	36	844	53	-	WP 3-452
1721	3H	5805999	Bucks Lake Dam Inst Video Surv Upgr FSI	-	-	-	-	-	-	-	289	807	39	-	WP 3-452
1722	3H	5806000	Butt Valley Dam Inst Video Surv FSI	-	-	-	-	-	296	707	35	-	-	-	WP 3-452
1723	3H	5806001	Cresta Dam Inst V. Surv/Sec Cameras FSI	-	-	-	45	194	349	152	-	-	-	-	WP 3-452
1724	3H	5806002	Grizzly Dam Inst Video & Sec Upgr FSI	-	-	-	-	-	-	-	289	807	39	-	WP 3-452
1725	3H	5806003	Lake Almanor Dam Inst Video&Sec Upgr FSI	-	-	-	-	-	396	683	35	-	-	-	WP 3-452
1726	3H	5806004	Lwr Bucks Dam Inst Video & Sec Upgr FSI	-	-	-	-	-	-	-	289	807	39	-	WP 3-452
1727	3H	5806005	Rock Creek Dam Inst Video & Sec Upgr FSI	-	-	-	38	184	1,177	169	-	-	-	-	WP 3-452
1728	3H	5806063	Pit 1 Fbay Inst V. Surv/Sec Cameras FSI	-	-	-	15	228	220	-	749	43	-	-	WP 3-452
1729	3H	5806064	Pit 1 Forebay Install Fencing FSI	-	-	-	-	-	50	125	1,088	-	-	-	WP 3-452
1730	3H	5806065	Pit 1 PH Inst Video Surv/Sec Cameras FSI	-	-	-	13	260	239	-	1,633	60	-	-	
1731	3H	5806066	Pit 3 Lk Britton Inst V.Surv/Sec Cam FSI	-	-	-	0	66	593	68	924	29	-	-	WP 3-452
1732	3H	5806067	Pit 3 VH Inst Security Upgrades FSI	-	-	-	-	-	-	-	109	281	40	-	
1733	3H	5806068	Pit 4 Div Dam Inst Cameras and IDS FSI	-	-	-	-	-	-	-	289	807	39	-	WP 3-452
1734	3H	5806069	Pit 4 PH Install Fencing FSI	-	-	-	-	-	-	-	153	1,343	-	-	
1735	3H	5806070	Pit 5 Open Conduit Install Fencing FSI	-	-	-	-	-	-	-	36	126	269	-	WP 3-452
1736	3H	5806071	Pit 5 Dam and OC Install Cameras FSI	-	-	-	-	-	-	-	36	278	915	35	WP 3-452

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1737	3H	5806119	Salt Springs Fencing Upgrades FSI	-	-	-	-	40	207	988	-	-	-	-	
1738	3H	5806120	Salt Spgs Dam Inst V. Surv/Sec Cams FSI	-	-	-	12	45	296	-	289	807	39	-	WP 3-452
1739	3H	5806121	Salt Spgs PH Inst V. Surv/Sec Cams FSI	-	-	-	13	9	230	-	-	278	915	35	WP 3-452
1740	3H	5806318	Inskip Eagle Cyn Div Dam Inst Slide Gate	-	-	-	0	119	-	-	-	-	-	-	
1741	3H	5806621	Courtright Dam Video Surv Upgrade FSI	-	-	-	-	14	-	307	1,092	45	-	-	WP 3-452
1742	3H	5806622	Wishon Dam Inst Video Surv/Security FSI	-	-	-	-	10	-	328	1,092	46	-	-	WP 3-452
1743	3H	5806623	Courtright Comm Twr Inst V. Surv/Sec FSI	-	-	-	-	15	-	-	377	1,053	51	-	WP 3-452
1744	3H	5806700	Lake Tabeaud Spillway Retrofit	-	-	-	-	-	-	-	-	183	260	609	WP 3-381
1745	3H	5806802	Phoenix Relicensing- Capital LC	-	-	-	-	-	522	829	1,038	-	-	-	
1746	3H	5806805	Butt Valley Wall Reinforcement SAIP - ST	-	-	-	-	24	-	-	238	275	312	1,874	WP 3-381
1747	3H	5806806	Bucks Storage Erosion Protect SAIP - ST	-	-	-	-	27	-	-	238	459	1,040	-	WP 3-381
1748	3H	5807778	Drum SW Inst Intrusion Detection FSI	-	-	-	9	727	33	-	-	-	-	-	
1749	3H	5806111	Salt Springs Spillway SAIP	-	-	-	1,229	691	-	-	-	-	-	-	
1750	3H	5808125	Belden Spillway Imprv Walls SAIP IRRM	-	-	-	-	333	6,500	1,165	2,054	16,515	10,402	47	WP 3-381
1751	3H	5808126	Cape Horn Erosion Protection - SAIP - ST	-	-	-	-	23	-	-	254	460	1,040	-	WP 3-381
1752	3H	5808252	Cresta PH Install Video & Sec Upgr FSI	-	-	-	-	41	290	68	-	-	-	-	
1753	3H	5808253	Courtright Comms Tower Fencing FSI	-	-	-	-	-	-	-	131	238	-	-	
1754	3H	5808254	CV Dam Fencing Upgrade FSI	-	-	-	-	-	-	-	153	1,049	-	-	WP 3-452
1755	3H	5808255	CV Dam Video Surveillance Upgrade FSI	-	-	-	-	-	-	-	289	807	39	-	WP 3-452
1756	3H	5808256	Drum Fbay Dam Install Cameras FSI	-	-	-	-	-	-	-	36	278	915	35	WP 3-452
1757	3H	5808257	Lake Almanor Intake Inst Sec Upgr FSI	-	-	-	-	-	-	-	109	317	40	-	WP 3-452
1758	3H	5808282	Lake Almanor Spillway Improv SAIP LT	-	-	-	-	-	-	-	238	229	2,080	1,874	WP 3-381
1759	3H	5808283	RV Spillway Armor Splash Pool SAIP IRRM	-	-	-	-	19	-	0	250	459	1,040	-	WP 3-381
1760	3H	5808284	NBC Spillway Improvements SAIP LT	-	-	-	-	-	-	-	-	-	-	469	WP 3-381
1761	3H	5808285	Belden Spillway Inst Log Boom SAIP IRRM	-	-	-	-	45	385	536	3,106	61	-	-	WP 3-381
1762	3H	5808286	BucksCreek LC Hutchins CG RMP and TMP	-	-	-	-	8	254	156	1,310	69	-	-	
1763	3H	5808307	Helms Upgrade Switchyard Road Gate FSI	-	-	-	-	48	-	-	-	-	-	-	
1764	3H	5808318	Lake Fordyce Install Cameras FSI	-	-	-	-	-	-	-	-	-	40	284	WP 3-452
1765	3H	5808319	Lake Valley Dam Install Cameras FSI	-	-	-	-	-	-	34	289	807	39	-	WP 3-452
1766	3H	5808320	Lower Bucks Lake Dam Install Fencing FSI	-	-	-	-	-	-	-	153	1,049	-	-	WP 3-452
1767	3H	5808321	Manzanita Dam Fencing Upgrade FSI	-	-	-	-	-	-	-	-	-	168	1,072	WP 3-452
1768	3H	5808322	Manzanita Dam Video Surv Upgrade FSI	-	-	-	-	-	-	-	-	-	316	825	WP 3-452
1769	3H	5808323	PV Scott Dam Install Cameras FSI	-	-	-	-	-	-	-	-	-	316	825	WP 3-452
1770	3H	5808324	PV Scott Dam Install Fencing Upgrade FSI	-	-	-	-	-	-	-	-	-	168	1,072	WP 3-452
1771	3H	5808325	Rock Creek Dam Desabla Inst Fencing FSI	-	-	-	-	31	0	0	153	1,049	-	-	WP 3-452
1772	3H	5808326	Rock Crk Inst Video & Security Upgr FSI	-	-	-	-	-	51	267	837	34	-	-	WP 3-452
1773	3H	5808327	Rucker Lake Dam Install Cameras FSI	-	-	-	-	-	-	-	-	35	316	825	WP 3-452
1774	3H	5808328	Rucker Lake Inst Fencing and Gate FSI	-	-	-	-	-	-	-	-	35	168	1,072	WP 3-452
1775	3H	5808329	Spaulding Dam 1 Install Cameras FSI	-	-	-	-	-	34	289	807	39	-	-	WP 3-452
1776	3H	5808330	Spaulding Dam 2 Install Access Gates FSI	-	-	-	-	-	142	1,088	-	-	-	-	WP 3-452
1777	3H	5808331	Spaulding Dam 2 Install Cameras FSI	-	-	-	-	-	34	289	807	39	-	-	WP 3-452
1778	3H	5808332	Upper Peak Lake Dam Install Cameras FSI	-	-	-	-	-	-	-	36	278	915	35	WP 3-452
1779	3H	5808333	Upper Peak Lake Upgrade Fencing FSI	-	-	-	-	-	-	-	36	148	1,189	-	WP 3-452
1780	3H	5808334	Wise Fbay Inst Video & Security Upgr FSI	-	-	-	-	-	-	-	-	35	316	825	WP 3-452
1781	3H	5808335	Belden Dam Intake Bldg Fencing FSI	-	-	-	-	25	0	0	-	11	168	928	WP 3-452
1782	3H	5808336	Butt Valley Dam Cntl Bldg Fencing FSI	-	-	-	-	22	-	-	-	14	218	1,398	
1783	3H	5808337	Drum Abay Dam Install Cameras FSI	-	-	-	-	-	50	-	153	1,049	39	-	
1784	3H	5808338	Halsey Fbay Dam Install Cameras FSI	-	-	-	-	-	-	-	289	807	39	-	WP 3-452
1785	3H	5808339	Lake Almanor LLO Fencing FSI	-	-	-	-	18	150	595	-	-	-	-	WP 3-452
1786	3H	5808340	Lake Tabeaud Inst Video Surveillance FSI	-	-	-	-	-	-	-	36	278	915	35	WP 3-452
1787	3H	5808341	Macumber Dam Inst Video & Sec Upg FSI	-	-	-	-	-	-	-	36	278	915	35	WP 3-452
1788	3H	5808342	Macumber Install Fencing FSI	-	-	-	-	-	-	-	36	148	1,189	-	WP 3-452
1789	3H	5808343	Cresta Dam Install Fencing FSI	-	-	-	-	30	0	0	153	1,049	-	-	WP 3-452
1790	3H	5808359	Helms Switchyard Video Surv - FSI	-	-	-	-	83	103	68	1,377	401	-	-	
1791	3H	5808627	Rock Crk SC Install Panic Button FSI	-	-	-	-	151	42	-	-	-	-	-	
1792	3H	5808628	Caribou SC Install Panic Button FSI	-	-	-	-	164	40	-	-	-	-	-	
1793	3H	5808828	Helms Upgrade Lost Canyon Road Gate FSI	-	-	-	-	48	-	-	-	-	-	-	
1794	3H	5808829	Helms Upgrade T-1 House Vehicle Gate FSI	-	-	-	-	48	-	-	-	-	-	-	
1795	3H	5808830	Helms Upgrade Hall Mountain Rd Gate FSI	-	-	-	-	47	-	-	-	-	-	-	
1796	3H	5808880	Belden Forebay Spillway Improv SAIP LT	-	-	-	-	-	-	-	238	229	520	469	WP 3-381
1797	3H	5808905	Caribou 1 Intake Fencing FSI	-	-	-	-	15	179	228	-	-	-	-	
1798	3H	5808906	Caribou 2 Intk Inst Video & Sec Upgr FSI	-	-	-	-	-	-	-	109	317	40	-	

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1799	3H	5808907	Caribou 2 PH Inst Video & Sec Upgr FSI	-	-	-	-	-	-	-	243	1,128	28	-	
1800	3H	5808908	Caribou 2 PH Install Fencing FSI	-	-	-	-	-	-	-	153	1,343	-	-	
1801	3H	5808909	Caribou 2 VH Install Fencing FSI	-	-	-	-	-	179	228	-	-	-	-	
1802	3H	5808910	Caribou 2 Intake Fencing FSI	-	-	-	-	28	179	228	-	-	-	-	
1803	3H	5808911	Caribou 2 Adit 1 Fencing FSI	-	-	-	-	15	-	-	-	-	143	243	
1804	3H	5808912	Caribou 2 Surge Tank Fencing FSI	-	-	-	-	29	179	228	-	-	-	-	
1805	3H	5808913	Cresta Surge Chamber Fencing FSI	-	-	-	-	15	180	228	-	-	-	-	
1806	3H	5808914	Cresta Grizzly Crk Conduit Fencing FSI	-	-	-	-	15	179	228	-	-	-	-	
1807	3H	5808915	Cresta Elephant Butte Adit Fencing FSI	-	-	-	-	15	-	-	-	-	218	1,789	
1808	3H	5808916	Cresta Bear Creek Adit Fencing FSI	-	-	-	-	15	-	-	-	-	186	317	
1809	3H	5808917	Cresta PH Install Fencing FSI	-	-	-	-	-	-	-	-	11	168	1,372	
1810	3H	5808921	Wise SW Ctr Inst Video Surveillance FSI	-	-	-	-	24	0	0	-	35	266	1,152	
1811	3H	5808922	Belden Siphon Stairs Fencing FSI	-	-	-	-	23	180	228	-	-	-	-	
1812	3H	5808923	Belden Surge Chamber Fencing FSI	-	-	-	-	23	180	228	-	-	-	-	
1813	3H	5808924	Belden PH Inst Video & Security Upgr FSI	-	-	-	-	-	-	-	243	1,128	28	-	
1814	3H	5808925	Belden PH Install Fencing FSI	-	-	-	-	-	-	-	-	11	168	1,372	
1815	3H	5808927	Butt Valley PH Inst Video & Sec Upgr FSI	-	-	-	-	-	234	882	25	-	-	-	
1816	3H	5808928	Butt Valley PH Install Fencing FSI	-	-	-	-	-	-	-	-	11	168	1,372	
1817	3H	5808929	Butt Valley VH Surveillance FSI	-	-	-	-	29	150	39	255	35	-	-	
1818	3H	5808930	Butt Valley Surge Tank Fencing FSI	-	-	-	-	20	-	-	-	14	186	317	
1819	3H	5808931	Butt Valley Spillway Fencing FSI	-	-	-	-	19	-	-	-	14	218	1,398	WP 3-452
1820	3H	5808932	Butt Valley Prattville Intk Fencing FSI	-	-	-	-	19	-	-	-	14	186	317	WP 3-452
1821	3H	5808933	Butt Valley VH Fencing FSI	-	-	-	-	19	-	-	-	14	186	317	
1822	3H	5808934	BV Scada Bldg & Intk Inst Fencing FSI	-	-	-	-	-	-	-	-	11	143	243	
1823	3H	5808935	Caribou 1 Intk Inst Video Surv FSI	-	-	-	-	-	-	-	109	317	40	-	
1824	3H	5808936	Caribou 1 VH Inst Video & Sec Upgr FSI	-	-	-	-	39	200	39	-	-	-	-	
1825	3H	5808937	Caribou 1 VH Fencing FSI	-	-	-	-	15	179	228	-	-	-	-	
1826	3H	5808943	Electra PH inst Video Surv/Sec Cams FSI	-	-	-	-	-	150	60	1,169	24	-	-	WP 3-452
1827	3H	5808944	Tiger Creek PH Inst V. Surv/Sec Cams FSI	-	-	-	-	-	-	-	36	235	1,279	-	WP 3-452
1828	3H	5808945	Lwr Bear Dam Inst Video Surv/Sec Cams FSI	-	-	-	-	-	-	-	36	278	915	35	WP 3-452
1829	3H	5808948	Strawberry Dam Intl Video Security FSI	-	-	-	-	-	-	-	36	278	915	35	WP 3-452
1830	3H	5808958	Caribou 1 Surge Tank Fencing FSI	-	-	-	-	-	179	228	-	-	-	-	

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1831	3H	5808959	Caribou 1 Adit 1 Fencing FSI	-	-	-	-	13	-	-	-	-	186	317	
1832	3H	5808960	Caribou 1 Adit 2 Fencing FSI	-	-	-	-	15	-	-	-	-	143	243	
1833	3H	5808978	Cresta VH Video & Sec Upgr FSI	-	-	-	-	-	-	-	109	281	40	-	
1834	3H	5808979	Grizzly PH Inst Video & Sec Upgr FSI	-	-	-	-	-	-	-	243	1,128	28	-	
1835	3H	5808980	Rock Creek Switchyard Fencing Upgr FSI	-	-	-	-	-	210	988	-	-	-	-	
1836	3H	5808981	Rock Creek VH Inst Video & Sec Upgr FSI	-	-	-	-	-	-	-	109	281	40	-	
1837	3H	5808982	Rock Creek Chambers Crk Adit Fencing FSI	-	-	-	-	18	0	0	-	-	143	243	
1838	3H	5808983	Rock Creek Jackass Crk Adit Fencing FSI	-	-	-	-	18	0	0	-	-	143	243	
1839	3H	5808984	Rock Creek Surge Chamber Fencing FSI	-	-	-	-	17	179	262	-	-	-	-	
1840	3H	5808985	Pit 4 PH Inst Cameras FSI	-	-	-	-	-	-	-	243	1,128	28	-	
1841	3H	5808986	Pit 1 Surge Tank Surveillance FSI	-	-	-	-	152	221	-	797	48	-	-	
1842	3H	5808987	Pit 1 Surge Tank Fencing FSI	-	-	-	-	220	124	13	-	-	-	-	
1843	3H	5808990	Electra PH Fencing & Permiter Upgr FSI	-	-	-	-	971	886	-	-	-	-	-	WP 3-228
1844	3H	5808992	Spaulding PH 1 Install Cameras FSI	-	-	-	-	-	-	34	243	1,128	28	-	
1845	3H	5808993	Spaulding PH 2 Install Cameras FSI	-	-	-	-	-	-	34	243	1,128	28	-	
1846	3H	5808994	Halsey PH & SWYD Install Cameras FSI	-	-	-	-	-	-	-	243	1,128	28	-	
1847	3H	5808995	Oak Flat Install Fencing Upgrade FSI	-	-	-	-	-	-	-	-	-	40	180	
1848	3H	5808996	Oak Flat PH Inst Video and Sec Upgr FSI	-	-	-	-	0	-	-	243	1,128	28	-	
1849	3H	5808997	Haney Inst Video & Sec Upgr FSI	-	-	-	-	210	-	-	-	-	-	-	
1850	3H	5809018	Hatchet Replace Cameras FSI	-	-	-	-	168	-	-	-	-	-	-	
1851	3H	5809019	CV PH Video & Security Upgrades FSI	-	-	-	-	-	-	-	243	1,128	28	-	
1852	3H	5809021	Pit 1 Remove Fall River Trap Club	-	-	-	-	-	-	272	571	23	-	-	
1853	3H	5809023	Mokelumne FERC-137 Relicensing	-	-	-	-	33	679	1,077	5,098	4,654	2,311	2,554	
1854	3H	5809130	Pit 1 River Access Parking Lot Improv	-	-	-	-	223	1,235	51	-	-	-	-	
1855	3H	5809402	Crane Valley Dam SAIP	-	-	-	-	110	918	-	-	-	-	-	WP 3-381
1856	3H	5809498	Strawberry Dam Fencing Upgrade FSI	-	-	-	-	-	-	-	36	148	1,189	-	WP 3-452
1857	3H	5809574	Tiger Creek VH Inst Video Surv FSI	-	-	-	-	-	-	-	109	281	40	-	
1858	3H	5809575	Tiger Creek PH Upgrade Fencing FSI	-	-	-	-	-	-	-	153	1,343	-	-	
1859	3H	5809838	Drum SW Ctr Inst Video Surveillance FSI	-	-	-	-	0	50	225	1,169	24	-	-	
1860	3H	5809922	Salt Springs Dam Upgrade Sec Fencing FSI	-	-	-	-	38	210	-	153	1,049	-	-	WP 3-452
1861	3H	5809923	Salt Sprs PH Inst Backup Gen Sec Com FSI	-	-	-	-	-	-	298	-	-	-	-	
1862	3H	5809924	Lake Tabeaud VH-Surg Tank Inst Surv FSI	-	-	-	-	-	150	-	36	106	319	36	
1863	3H	5809925	Lake Tabeaud VH-Surg Tank Upgr Fnc FSI	-	-	-	-	-	-	-	131	238	-	-	
1864	3H	5810101	Butt Valley Dam Fencing Upgrade FSI	-	-	-	-	-	-	-	-	11	168	1,072	
1865	3H	5810320	Potter Valley License Amendment	-	-	-	-	-	22	-	-	-	-	-	
1866	3H	5811780	Lake Tabeaud Install Fencing FSI	-	-	-	-	-	-	-	36	148	1,189	-	WP 3-452
1867	3H	5812218	UNFFR LC Almanor Scenic Overlook Upgr	-	-	-	-	-	-	-	47	246	553	-	
1868	3H	5812219	UNFFR LC Belden Fbay Cartop Boat Acc New	-	-	-	-	-	-	-	0	-	-	369	
1869	3H	5812220	UNFFR LC Belden Reach Trails New	-	-	-	-	-	-	-	501	674	-	-	
1870	3H	5812221	UNFFR LC Belden Rest Stop (SR 70) Upgr	-	-	-	-	-	-	-	91	313	570	-	
1871	3H	5812222	UNFFR LC ButtValley PH Angler Trails New	-	-	-	-	-	-	-	0	-	-	365	
1872	3H	5812223	UNFFR LC Camp Conery Upgr	-	-	-	-	-	-	-	0	106	444	-	
1873	3H	5812224	UNFFR LC Catfish Beach Upgr	-	-	-	-	-	-	-	16	373	1,352	-	
1874	3H	5812225	UNFFR LC Cool Springs Campground Upgr	-	-	-	-	-	-	-	0	-	-	374	
1875	3H	5812226	UNFFR LC Eastshore DUA Area Upgr	-	-	-	-	-	-	-	83	667	471	7,498	
1876	3H	5812227	UNFFR LC N.Shore Public Boat Launch Upgr	-	-	-	-	-	-	-	147	726	4,489	103	
1877	3H	5812228	UNFFR LC Ponderosa Flat CG Upgr	-	-	-	-	-	-	-	0	-	-	525	
1878	3H	5812229	UNFFR LC Ray Adams Boat Launch Upgr	-	-	-	-	-	-	-	0	-	-	524	
1879	3H	5812230	UNFFR LC StoverRnch Chester Shin Acc New	-	-	-	-	-	-	-	0	-	340	720	
1880	3H	5812231	UNFFR LC Stumpy Beach New	-	-	-	-	-	-	-	131	347	1,565	33	
1881	3H	5812232	UNFFR LC SW Shoreline Access Zone Upgr	-	-	-	-	-	-	-	0	461	1,425	18	
1882	3H	5812233	UNFFR LC Westwood Beach New	-	-	-	-	-	-	45	151	345	2,285	56	
1883	3H	5812234	DeSabla LC - Capital	-	-	-	-	-	-	269	988	4,505	9,292	8,553	
1884	3H	5812235	Helms Relicensing - Capital LC	-	-	-	-	-	-	-	0	-	-	17,025	
1885	3H	5812236	Kerckhoff 1 &2 Relicensing - Capital LC	-	-	-	-	-	-	-	2,863	3,265	11,876	2,634	
1886	3H	5812237	Balch 1 & 2 Relicensing - Capital LC	-	-	-	-	-	-	-	0	-	-	9,083	
1887	3H	5812238	Rock Creek-Cresta FERC-1962 Relicensing	-	-	-	-	-	-	-	285	665	1,541	4,966	
1888	3H	5812239	BucksCreek LC Sandy Pt DUA Rd Imprvs TMP	-	-	-	-	-	-	-	-	69	104	187	
1889	3H	5812240	Phoenix Forebay Install Butterfly Valve	-	-	-	-	-	-	-	285	780	-	-	
1890	3H	5812255	Spaulding Dam 2 Upgrade Fencing FSI	-	-	-	-	-	15	142	1,088	-	-	-	WP 3-452
1891	3H	5812256	Spaulding Dam 1 Upgrade Fencing FSI	-	-	-	-	-	30	142	1,088	-	-	-	WP 3-452

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1892	3H	5812257	Spa Comms Bldg Video & Security Upgr FSI	-	-	-	-	-	-	-	-	35	316	825	
1893	3H	5812258	Drum 1 PH Upgrade Fencing FSI	-	-	-	-	-	50	142	1,088	-	-	-	
1894	3H	5812259	Drum 2 PH Video & Security Upgrade FSI	-	-	-	-	-	-	-	36	278	915	35	
1895	3H	5812260	Drum 2 PH Upgrade Fencing FSI	-	-	-	-	-	-	-	36	235	1,279	25	
1896	3H	5812263	Drum Abay Dam Upgrade Fencing FSI	-	-	-	-	-	50	142	1,088	-	-	-	
1897	3H	5812264	Drum Fbay Dam Upgrade Fencing FSI	-	-	-	-	-	50	142	1,088	-	-	-	WP 3-452
1898	3H	5812265	Pit 1 Valvehouse Fencing Upgrade FSI	-	-	-	-	-	50	139	321	-	-	-	
1899	3H	5812266	Pit 1 PH Fencing Upgrade FSI	-	-	-	-	-	50	125	1,504	-	-	-	
1900	3H	5812268	Pit 4 VH Inst Cameras and IDS FSI	-	-	-	-	-	50	89	292	35	-	-	
1901	3H	5812269	Red Hill Microwave Tower V. Surv FSI	-	-	-	-	-	150	268	36	-	-	-	
1902	3H	5812270	Cresta Valvehouse Fencing FSI	-	-	-	-	-	179	228	-	-	-	-	
1903	3H	5812271	Rock Creek VH Fencing Upgrade FSI	-	-	-	-	-	179	169	-	-	-	-	
1904	3H	5812272	Belden FB Adit Fencing FSI	-	-	-	-	-	-	-	-	-	143	243	
1905	3H	5812273	Bucks Lake VH Security Upgrade FSI	-	-	-	-	-	-	-	109	281	40	-	
1906	3H	5812274	Caribou 2 Valvehouse Security Upgr FSI	-	-	-	-	-	-	-	109	281	40	-	
1907	3H	5812275	Courtright Dam Gatehouse Veh. Gate FSI	-	-	-	-	-	-	125	1,088	-	-	-	
1908	3H	5812276	Dutch Flat PH Upgrade Fencing FSI	-	-	-	-	-	-	-	36	148	1,523	-	
1909	3H	5812277	Dutch Flat PH Video & Security Upgr FSI	-	-	-	-	-	-	-	-	-	40	240	
1910	3H	5812278	Dutch Flat VH inst Camera FSI	-	-	-	-	-	-	-	-	-	40	108	
1911	3H	5812279	Grizzly Valvehouse Security Upgrade FSI	-	-	-	-	-	-	-	109	281	40	-	
1912	3H	5812280	Hall Mtn Repeater Fence & Sec. Upgr FSI	-	-	-	-	-	-	106	246	-	-	-	
1913	3H	5812281	Helms Switchyard Fencing Upgrade FSI	-	-	-	-	-	-	125	1,088	-	-	-	
1914	3H	5812282	Helms T2 Tunnel Upg Vehic Gate FSI	-	-	-	-	-	-	106	246	-	-	-	
1915	3H	5812283	Helms Surge Chamber Install Cameras FSI	-	-	-	-	-	-	89	328	35	-	-	
1916	3H	5812284	Lake Fordyce Dam Upgrade Fencing FSI	-	-	-	-	-	-	-	36	148	1,189	-	WP 3-452
1917	3H	5812285	PV Switchyard Video Surveillance FSI	-	-	-	-	-	-	-	-	-	316	825	
1918	3H	5812286	Wise 2 PH Inst Video Surveillance FSI	-	-	-	-	-	-	-	-	35	266	1,152	
1919	**3H**	**3H Total**		**17,708**	**16,696**	**18,648**	**35,347**	**40,795**	**60,956**	**78,507**	**136,118**	**247,462**	**278,598**	**274,772**	Sum of Lines 1607-1918
1920															
1921		**Grand Total**		**197,937**	**208,020**	**219,894**	**273,574**	**452,358**	**370,290**	**357,210**	**501,186**	**631,536**	**638,685**	**676,346**	Sum of Lines 14,22,27,252,940,1332, 1605,1919 and 1921

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Line No.	Year	Program/Activity	Amount		Detailed Description/Assumptions	Reference From
1	**2024**	**Adjusted Recorded**	**70,347**			WP 3-55, Line 4
2		Adjustment	7,351		Fordyce Dam Projects	WP 3-64 to 67, Lines 37,239,240
3		Adjustment	-3,113		Caribou 2 PH U5 Upgr Gen Protect Relays	WP 3-66, Line 169
4		Adjustment	-2,210		Helms – Replace Gen CO2 Fire System	WP 3-67, Line 194
5		Adjustment	-1,234		Pit 3 PH Seismic Retrofit	WP 3-64 , Line 36
6		Misc Adjustment	-894		Net adjustment for yearly cost fluctuations	Remaining adjustments
7		**Total Net Change**	**-100**			Sum of Lines 2-6
8						
9	**2025**	**Forecast**	**70,247**			Line 1 + Line 7 and WP 3-55, Line 4
10		Adjustment	-16,393		Fordyce Dam Projects	WP 3-64 to 67, Lines 37,239,240
11		Adjustment	-9,216		Pit 3 PH Seismic Retrofit	WP 3-64 , Line 36
12		Adjustment	1,915		Pit 1 PH Ctrl & AVR Rm Rebuild Non-Comb	WP 3-67 , Line 187
13		Misc Adjustment	-478		Net adjustment for yearly cost fluctuations	Remaining adjustments
14		**Total Net Change**	**-24,172**			Sum of Lines 10-13
15						
16	**2026**	**Forecast**	**46,075**			Line 9 + Line 14 and WP 3-55, Line 4
17		Adjustment	-20,831		Fordyce Dam Projects	WP 3-64 to 67, Lines 37,239,240
18		Adjustment	11,629		Lower Bucks Dam Resurface DS Face	WP 3-65 , Line 104
19		Adjustment	5,654		Kerckhoff 2 - Replace CO2 System	WP 3-64, Line 39
20		Adjustment	8,266		Crane Valley Equipment Life Cycle Replacment	WP 3-65 to 66, Lines 66, 124
21		Adjustment	3,423		Balch 2 – Arc Flash Mitigation of Overst	WP 3-67, Line 188
22		Misc Adjustment	986		Net adjustment for yearly cost fluctuations	Remaining adjustments
23		**Total Net Change**	**9,127**			Sum of Lines 17-22
24						

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Line No.	Year	Program/Activity	Amount		Detailed Description/Assumptions	Reference From
25	**2027**	**Forecast**	**55,202**			Line 16 + Line 23 and WP 3-55, Line 4
26		Adjustment	10,400		Pit 7 U1 and 2 Radial Gates - Arms and Trunnions	WP 3-64 to 65, Lines 53, 70
27		Adjustment	4,303		Fordyce Dam Projects	WP 3-64 to 67, Lines 37,239,240
28		Adjustment	1,473		Pit 6 U1 and 2 Radial Gates - Arms and Trunnions	WP 3-64 to 65, Lines 54, 69
29		Adjustment	-6,120		Kerckhoff 2 - Replace CO2 System	WP 3-64, Line 39
30		Adjustment	-11,186		Crane Valley Equipment Life Cycle Replacment	WP 3-65 to 66, Lines 66, 124
31		Misc Adjustment	1,609		Net adjustment for yearly cost fluctuations	Remaining adjustments
32		**Total Net Change**	**480**			Sum of Lines 26-31
33						
34	**2028**	**Forecast**	**55,682**			Line 25 + Line 32 and WP 3-55, Line 4
35		Adjustment	11,948		Pit 6 U1 and 2 Radial Gates - Arms and Trunnions	WP 3-64 to 65, Lines 54, 69
36		Adjustment	2,983		Pit 5 Penstock Geotechnical Hardening	WP 3-68, Line 246
37		Adjustment	2,014		Helms - Repl Zone 12 Fire Protect Sys	WP 3-66, Line 141
38		Adjustment	1,860		Stanislaus CO2 Fire Protection Systems	WP 3-64 , Line 45
39		Adjustment	1,433		Coleman Upgr 120/208V Switchgear	WP 3-66, Line 170
40		Adjustment	1,389		Pit 1 Dam Recoat Radial Gate 5 GIR	WP 3-67, Line 230
41		Adjustment	-10,800		Pit 7 U1 and 2 Radial Gates - Arms and Trunnions	WP 3-64 to 65, Lines 53, 70
42		Adjustment	-10,451		Lower Bucks Dam Resurface DS Face	WP 3-65 , Line 104
43		Misc Adjustment	994		Net adjustment for yearly cost fluctuations	Remaining adjustments
44		**Total Net Change**	**1,370**			Sum of Lines 35-43
45						
46	**2029**	**Forecast**	**57,052**			Line 34 + Line 44 and WP 3-55, Line 4
47		Adjustment	-11,666		Pit 6 U1 and 2 Radial Gates - Arms and Trunnions	WP 3-64 to 65, Lines 54, 69
48		Adjustment	-10,850		Fordyce Dam Projects	WP 3-64 to 67, Lines 37,239,240
49		Adjustment	-2,253		Helms - Repl Zone 12 Fire Protect Sys	WP 3-66, Line 141
50		Misc Adjustment	-519		Net adjustment for yearly cost fluctuations	Remaining adjustments
51		**Total Net Change**	**-25,289**			Sum of Lines 47-50
52						
53	**2030**	**Forecast**	**31,764**			Line 46 + Line 51 and WP 3-55, Line 4

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Line No.	Year	Program/Activity	Amount		Detailed Description/Assumptions	Reference From
1	**2024**	**Adjusted Recorded**	**196,209**			WP 3-55, Line 5
2		Adjustment	-14,897		Bucks Creek Equipment Life Cycle Replacement	WP 3-68 to 79, Lines 299,322,555,686,923
3		Adjustment	-9,601		Caribou Equipment Life Cycle Replacement	WP 3-68 to 75, Lines 267,269,279,280,285,379,674
4		Adjustment	-7,724		West Point Equipment Life Cycle Replacement	WP 3-73 to 75, Lines 606,700-702
5		Adjustment	-5,413		Helms Draft Tube Gate & Turbine Improvements	WP 3-70 to 77, Lines 412-414,660,788,813,835-837,838,852-854
6		Adjustment	-5,294		Stan PH Rpl Thrust Bearing Cooling Coil	WP 3-74, Line 647
7		Adjustment	-4,413		Halsey PH - Replace Exciter, Runner and Wicket	WP 3-69 to 70, Lines 341, 376
8		Adjustment	-2,204		Poe Equipment Life Cycle Replacement	WP 3-70 to 73, Lines 384,385,467,468,592
9		Adjustment	-3,605		Belden Equipment Life Cycle Replacement	WP 3-71 to 76, Lines 451,664,748
10		Adjustment	-2,681		Spaulding 2 Replc Bearings and Gov Ctrls	WP 3-78, Line 857
11		Adjustment	-2,435		Helms - Switchyard Emerg Access/Elevator	WP 3-69, Line 317
12		Adjustment	-1,770		Helms U3 Rotor Demo	WP 3-71, Line 461
13		Misc Adjustment	-8,996		Net adjustment for yearly cost fluctuations on generator Rewind/Restack related projects	Remaining adjustments
14		**Total Net Change**	**-69,034**			Sum of Lines 2-13
15						
16	**2025**	**Forecast**	**127,175**			Line 1 + Line 14 and WP 3-55, Line 5
17		Adjustment	14,092		Helms Draft Tube Gate & Turbine Improvements	WP 3-70 to 77, Lines 412-414,660,788,813,835-837,838,852-854
18		Adjustment	8,803		Hydro Powerhouse Modernization	WP 3-73 to 79, Lines 581,691,718, 731,737,738,757,831,917-921,933
19		Adjustment	3,512		Cresta PH Crane Upgrade	WP 3-69, Line 331
20		Adjustment	-28,752		Spaulding 1 and 2 (Water Delivery/Public Safety)	WP 3-77, Lines 815,832,834,839
21		Adjustment	-5,806		Pit 4 Replace Generator Air Breakers	WP 3-69, Line 363
22		Misc Adjustment	-128		Net adjustment for yearly cost fluctuations on generator Rewind/Restack related projects	Remaining adjustments
23		**Total Net Change**	**-8,279**			Sum of Lines 17-22

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Line No.	Year	Program/Activity	Amount		Detailed Description/Assumptions	Reference From
24						
25	**2026**	**Forecast**	**118,896**			Line 16 + Line 23 and WP 3-55, Line 5
26		Adjustment	23,668		Caribou Equipment Life Cycle Replacement	WP 3-68 to 75, Lines 267,269,279,280,285,379,674
27		Adjustment	11,273		Balch 2 Equipment Life Cycle Replacement	WP 3-71 to 73, Lines 481, 585
28		Adjustment	10,210		Hydro Powerhouse Modernization	WP 3-73 to 79, Lines 581,691,718, 731,737,738,757,831,917-921,933
29		Adjustment	6,539		Drum 2 U5 Rewind	WP 3-69, Line 338
30		Adjustment	5,010		Pit 3 Equipment Life Cycle Replacement	WP 3-69 to 75, Lines 320,355,677
31		Adjustment	4,273		Pit 6 U1 and 2 Turbine Upgrades	WP 3-68, Lines 276, 277
32		Adjustment	6,899		Helms Incremental Lifecycle Replacement	WP 3-78, Lines 858-860
33		Adjustment	4,050		Rock Creek Equipment Life Cycle Replacement	WP 3-75 to 79, Lines 711,789,934
34		Adjustment	2,664		Cresta PH Crane Upgrade	WP 3-69, Line 331
35		Adjustment	2,336		Cresta Equipment Life Cycle Replacement	WP 3-69 to 76, Lines 324,333,499,751,756
36		Adjustment	2,176		West Point Equipment Life Cycle Replacement	WP 3-73 to 75, Lines 606,700-702
37		Misc Adjustment	4,987		Net adjustment for yearly cost fluctuations on generator Rewind/Restack related projects	Remaining adjustments
38		**Total Net Change**	**84,086**			Sum of Lines 26-37
39						
40	**2027**	**Forecast**	**202,981**			Line 25 + Line 38 and WP 3-55, Line 5
41		Adjustment	43,589		Helms Draft Tube Gate & Turbine Improvements	WP 3-70 to 77, Lines 412-414,660,788,813,835-837,838,852-854
42		Adjustment	-6,176		Cresta PH Crane Upgrade	WP 3-69, Line 331
43		Adjustment	-8,614		Balch 2 Equipment Life Cycle Replacement	WP 3-71 to 73, Lines 481, 585
44		Adjustment	-21,635		Caribou Equipment Life Cycle Replacement	WP 3-68 to 75, Lines 267,269,279,280,285,379,674
45		Misc Adjustment	-314		Net adjustment for yearly cost fluctuations on generator Rewind/Restack related projects	Remaining adjustments
46		**Total Net Change**	**6,850**			Sum of Lines 41-45
47						

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Line No.	Year	Program/Activity	Amount		Detailed Description/Assumptions	Reference From
48	**2028**	**Forecast**	**209,832**			Line 40 + Line 46 and WP 3-55, Line 5
49		Adjustment	7,647		Pit 6 U1 and 2 Turbine Upgrades	WP 3-68, Lines 276, 277
50		Adjustment	6,485		Helms Incremental Lifecycle Replacement	WP 3-78, Lines 858-860
51		Adjustment	4,592		Hydro Powerhouse Modernization	WP 3-73 to 79, Lines 581,691,718, 731,737,738,757,831,917-921,933
52		Adjustment	-29,984		Helms Draft Tube Gate & Turbine Improvements	WP 3-70 to 77, Lines 412-414,660,788,813,835-837,838,852-854
53		Misc Adjustment	1,550		Net adjustment for yearly cost fluctuations on generator Rewind/Restack related projects	Remaining adjustments
54		**Total Net Change**	**-9,711**			Sum of Lines 49-53
55						
56	**2029**	**Forecast**	**200,121**			Line 48 + Line 54 and WP 3-55, Line 5
57		Adjustment	32,267		Kings River Equipment Life Cycle Replacement	WP 3-74 to 78, Lines 631, 914
58		Adjustment	7,257		Cresta Equipment Life Cycle Replacement	WP 3-69 to 76, Lines 324,333,499,751,756
59		Adjustment	6,787		Pit 6 U1 and 2 Turbine Upgrades	WP 3-68, Lines 276, 277
60		Adjustment	6,436		Pit 7 U1 Replace Runner	WP 3-68, Line 274
61		Adjustment	-12,109		Hydro Powerhouse Modernization	WP 3-73 to 79, Lines 581,691,718, 731,737,738,757,831,917-921,933
62		Misc Adjustment	2,862		Net adjustment for yearly cost fluctuations on generator Rewind/Restack related projects	Remaining adjustments
63		**Total Net Change**	**43,501**			Sum of Lines 57-62
64						
65	**2030**	**Forecast**	**243,622**			Line 56 + Line 63 and WP 3-55, Line 5

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Line No.	Year	Program/Activity	Amount		Detailed Description/Assumptions	Reference From
1	**2024**	**Adjusted Recorded**	**102,324**			WP 3-55, Line 6
2		Adjustment	15,408		Spaulding Dam 1 Replace LLO	WP 3-83, Line 1214
3		Adjustment	11,812		Rock Creek Cresta Coffer Dam DOE	WP 3-81, Line 1061
4		Adjustment	-2,584		Coleman Forebay Dam Inst Seepage Monitor	WP 3-82, Line 1138
5		Adjustment	-5,409		Courtright - Dam Concrete Liner Repairs	WP 3-84, Line 1244
6		Adjustment	-7,001		JBB IC Dam LLO Rplce Act & Piping DOE	WP 3-81, Line 1069
7		Adjustment	-11,125		South Yuba Pipe Replacement	WP 3-84, Line 1245
8		Adjustment	-11,965		Courtright Dam Upgrade I/D Gate Control	WP 3-80, Line 1008
9		Misc Adjustment	-2,744		Net adjustment for yearly cost fluctuations on Reservoir and Dam related projects	Remaining adjustments
10		**Total Net Change**	**-13,609**			Sum of Lines 2-9
11						
12	**2025**	**Forecast**	**88,716**			Line 1 + Line 10 and WP 3-55, Line 6
13		Adjustment	4,936		Lower Blue Seepage Reduction DOE	WP 3-81, Line 1056
14		Adjustment	-4,018		Courtright Dam Upgrade I/D Gate Control	WP 3-80, Line 1008
15		Adjustment	-4,421		Rock Creek Cresta Coffer Dam DOE	WP 3-81, Line 1061
16		Adjustment	0		Tiger Creek Abay Spillway Gates Automation	WP 3-82, Line 1104
17		Misc Adjustment	-6,050		Net adjustment for yearly cost fluctuations on Reservoir and Dam related projects	Remaining adjustments
18		**Total Net Change**	**-9,552**			Sum of Lines 13-17
19						
20	**2026**	**Forecast**	**79,164**			Line 12 + Line 18 and WP 3-55, Line 6
21		Adjustment	5,656		Spaulding Dam 1 Replace LLO	WP 3-83, Line 1214
22		Adjustment	-12,778		Rock Creek Cresta Coffer Dam DOE	WP 3-81, Line 1061
23		Misc Adjustment	-807		Net adjustment for yearly cost fluctuations on Reservoir and Dam related projects	Remaining adjustments
24		**Total Net Change**	**-7,929**			Sum of Lines 21-23
25						

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Line No.	Year	Program/Activity	Amount		Detailed Description/Assumptions	Reference From
26	**2027**	**Forecast**	**71,234**			Line 20 + Line 24 and WP 3-55, Line 6
27		Adjustment	14,291		Relief Dam Resurface Upstream Liner	WP 3-82, Line 1140
28		Adjustment	8,542		Dams - Spillway Gate Program	WP 3-81 to 85, Lines 1092,1093,1173,1317,1331
29		Adjustment	6,699		Pit 3 Dam Rest Plunge Pool & Wing Wall	WP 3-82, Line 1155
30		Misc Adjustment	-2,755		Net adjustment for yearly cost fluctuations on Reservoir and Dam related projects	Remaining adjustments
31		**Total Net Change**	**26,778**			Sum of Lines 27-30
32						
33	**2028**	**Forecast**	**98,012**			Line 26 + Line 31 and WP 3-55, Line 6
34		Adjustment	-6,714		Dams - Spillway Gate Program	WP 3-81 to 85, Lines 1092,1093,1173,1317,1331
35		Adjustment	-7,080		Pit 3 Dam Rest Plunge Pool & Wing Wall	WP 3-82, Line 1155
36		Misc Adjustment	-1,259		Net adjustment for yearly cost fluctuations on Reservoir and Dam related projects	Remaining adjustments
37		**Total Net Change**	**-15,053**			Sum of Lines 34-36
38						
39	**2029**	**Forecast**	**82,959**			Line 33 + Line 37 and WP 3-55, Line 6
40		Adjustment	21,879		Sand Bar Dam Reduce Leakage	WP 3-83, Line 1167
41		Misc Adjustment	538		Net adjustment for yearly cost fluctuations on Reservoir and Dam related projects	Remaining adjustments
42		**Total Net Change**	**22,418**			Sum of Lines 40-41
43						
44	**2030**	**Forecast**	**105,377**			Line 39 + Line 42 and WP 3-55, Line 6

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Line No.	Year	Program/Activity	Amount		Detailed Description/Assumptions	Reference From
1	**2024**	**Adjusted Recorded**	**37,023**			WP 3-55, Line 7
2		Adjustment	-6,460		Road Improvements/Safety	WP 3-88, Lines 1490,1502
3		Adjustment	-2,279		Cedar Mill Property Purchase Motherlode	WP 3-88, Line 1466
4		Adjustment	-1,246		Kerckhoff Dam Repl Stairway to IFR	WP 3-87, Line 1426
5		Adjustment	-1,112		Pit 5 PH Road Mitigate Landslide	WP 3-89, Line 1558
6		Adjustment	-1,024		Auburn Regional SC - Power Gen Command C	WP 3-88, Line 1501
7		Adjustment	-1,012		Spaulding Tram Improvments	WP 3-89, Line 1567
8		Misc Adjustment	-4,528		Net adjustment for yearly cost fluctuations on Hydro Buildings related projects	Remaining adjustments
9		**Total Net Change**	**-17,660**			Sum of Lines 2-8
10						
11	**2025**	**Forecast**	**19,363**			Line 1 + Line 9 and WP 3-55, Line 7
12		Adjustment	5,348		JBB Willow Creek Rd Stabilization	WP 4-87, Line 1416
13		Adjustment	4,203		Pit 3 Repave Road	WP 4-87, Line 1417
14		Adjustment	2,525		Pit 4 PH Upgrade Crane(s)	WP 4-87, Line 1412
15		Misc Adjustment	1,159		Net adjustment for yearly cost fluctuations on Hydro Buildings related projects	Remaining adjustments
16		**Total Net Change**	**13,236**			Sum of Lines 12-15
17						
18	**2026**	**Forecast**	**32,599**			Line 11 + Line 16 and WP 3-55, Line 7
19		Misc Adjustment	-65		Net adjustment for yearly cost fluctuations on Hydro Buildings related projects	Remaining adjustments
20		**Total Net Change**	**-65**			Line 19
21						

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Line No.	Year	Program/Activity	Amount		Detailed Description/Assumptions	Reference From
22	**2027**	**Forecast**	**32,533**			Line 18 + Line 20 and WP 3-55, Line 7
23		Adjustment	-2,535		Balch 1 Rplc 115kv Switching Structure	WP 4-88, Line 1482
24		Adjustment	-5,285		Pit 4 PH Upgrade Crane(s)	WP 4-87, Line 1412
25		Adjustment	-7,099		Pit 3 Tailrace Bridge Refb Pier Voids	WP 4-87, Line 1448
26		Misc Adjustment	1,755		Net adjustment for yearly cost fluctuations on Hydro Buildings related projects	Remaining adjustments
27		**Total Net Change**	**-13,164**			Sum of Lines 23-26
28						
29	**2028**	**Forecast**	**19,369**			Line 22 + Line 27 and WP 3-55, Line 7
30		Misc Adjustment	-785		Net adjustment for yearly cost fluctuations on Hydro Buildings related projects	Remaining adjustments
31		**Total Net Change**	**-785**			Line 30
32						
33	**2029**	**Forecast**	**18,585**			Line 29 + Line 31 and WP 3-55, Line 7
34		Misc Adjustment	869		Net adjustment for yearly cost fluctuations on Hydro Buildings related projects	Remaining adjustments
35		**Total Net Change**	**869**			Line 34
36						
37	**2030**	**Forecast**	**19,453**			Line 33 + Line 35 and WP 3-55, Line 7

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Line No.	Year	Program/Activity	Amount		Detailed Description/Assumptions	Reference From
1	**2024**	**Adjusted Recorded**	**40,795**			WP 3-55, Line 8
2		Adjustment	5,078		Spillway Assessment and Improvement Prgm Cap Mitigation	WP 3-90 to 94, Lines 1637-1648,1650,1651,1719, 1746,1747,1749,1750,1751,1758-1761,1796,1855
3		Adjustment	3,532		FERC Security Improvements Projects	WP 3-90 to 95, Lines 1634,1635,1709-1711,1714,1716-1718,1720-1739,1741-1743,1748,1752-1757,1763-1795,1797-1851,1856-1864,1866,1890-1918
4		Adjustment	4,059		FERC Relicensing Projects	WP 3-90 to 94, Lines 1608,1609,1611,1612,1614,1615,1622-1627,1636,1853,1887
5		Adjustment	2,717		Crane Valley License Amendment	WP 3-91, Line 1649
6		Adjustment	1,163		Poe LC Sandy Beach Improvements DOE	WP 3-90, Line 1629
7		Adjustment	1,012		Pit 1 River Access Parking Lot Improv	WP 3-94, Line 1854
8		Adjustment	782		Salmon Habitat Expansion Agreement	WP 3-90 to 91, Lines 1628,1708
9		Misc Adjustment	1,817		Net adjustment for yearly cost fluctuations on relicensing spending for other licenses	Remaining adjustments
10		**Total Net Change**	**20,160**			Sum of Lines 2-9
11						
12	**2025**	**Forecast**	**60,956**			Line 1 + Line 10 and WP 3-55, Line 8
13		Adjustment	9,028		Spillway Assessment and Improvement Prgm Cap Mitigation	WP 3-90 to 94, Lines 1637-1648,1650,1651,1719, 1746,1747,1749,1750,1751,1758-1761,1796,1855
14		Adjustment	3,824		FERC Security Improvements Projects	WP 3-90 to 95, Lines 1634,1635,1709-1711,1714,1716-1718,1720-1739,1741-1743,1748,1752-1757,1763-1795,1797-1851,1856-1864,1866,1890-1918
15		Adjustment	3,658		Salmon Habitat Expansion Agreement	WP 3-90 to 91, Lines 1628,1708
16		Adjustment	1,882		McCloud Pit License Conditions	WP 3-91, Lines 1652 - 1682,1705
17		Adjustment	1,457		BucksCreekLC Bucks Pnstk Rd Improvs	WP 3-91, Line 1704
18		Adjustment	-2,386		FERC Relicensing Projects	WP 3-90 to 94, Lines 1608,1609,1611,1612,1614,1615,1622-1627,1636,1853,1887
19		Misc Adjustment	88		Net adjustment for yearly cost fluctuations on relicensing spending for other licenses	Remaining adjustments
20		**Total Net Change**	**17,552**			Sum of Lines 13-19
21						
22	**2026**	**Forecast**	**78,507**			Line 12 + Line 20 and WP 3-55, Line 8

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Line No.	Year	Program/Activity	Amount		Detailed Description/Assumptions	Reference From
23		Adjustment	27,169		Spillway Assessment and Improvement Prgm Cap Mitigation	WP 3-90 to 94, Lines 1637-1648,1650,1651,1719, 1746,1747,1749,1750,1751,1758-1761,1796,1855
24		Adjustment	19,033		FERC Security Improvements Projects	WP 3-90 to 95, Lines 1634,1635,1709-1711,1714,1716-1718,1720-1739,1741-1743,1748,1752-1757,1763-1795,1797-1851,1856-1864,1866,1890-1918
25		Adjustment	6,485		McCloud Pit License Conditions	WP 3-91, Lines 1652 - 1682,1705
26		Adjustment	3,469		FERC Relicensing Projects	WP 3-90 to 94, Lines 1608,1609,1611,1612,1614,1615,1622-1627,1636,1853,1887
27		Adjustment	2,863		Kerckhoff 1 &2 License Conditions	WP 3-94, Line 1885
28		Adjustment	-1,641		BucksCreekLC Bucks Pnstk Rd Improvs	WP 3-91, Line 1704
29		Misc Adjustment	234		Net adjustment for yearly cost fluctuations on relicensing spending for other licenses	Remaining adjustments
30		**Total Net Change**	**57,611**			Sum of Lines 23-29
31						
32	**2027**	**Forecast**	**136,118**			Line 22 + Line 30 and WP 3-55, Line 8
33		Adjustment	86,545		Spillway Assessment and Improvement Prgm Cap Mitigation	WP 3-90 to 94, Lines 1637-1648,1650,1651,1719, 1746,1747,1749,1750,1751,1758-1761,1796,1855
34		Adjustment	8,613		McCloud Pit License Conditions	WP 3-91, Lines 1652 - 1682,1705
35		Adjustment	7,526		FERC Security Improvements Projects	WP 3-90 to 95, Lines 1634,1635,1709-1711,1714,1716-1718,1720-1739,1741-1743,1748,1752-1757,1763-1795,1797-1851,1856-1864,1866,1890-1918
36		Adjustment	3,517		DeSabla Centerville License Conditions	WP 3-94, Line 1883
37		Adjustment	2,762		Drum Spaulding License Conditions	WP 3-90, Line 1613
38		Adjustment	1,967		Bucks Creek License Conditions	WP 3-91, Lines 1690,1694,1703
39		Misc Adjustment	415		Net adjustment for yearly cost fluctuations on relicensing spending for other licenses	Remaining adjustments
40		**Total Net Change**	**111,343**			Sum of Lines 33-39
41						

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Line No.	Year	Program/Activity	Amount		Detailed Description/Assumptions	Reference From
42	**2028**	**Forecast**	**247,462**			Line 32 + Line 40 and WP 3-55, Line 8
43		Adjustment	17,819		McCloud Pit License Conditions	WP 3-91, Lines 1652 - 1682,1705
44		Adjustment	8,611		Kerckhoff 1 &2 License Conditions	WP 3-94, Line 1885
45		Adjustment	7,404		Salmon Habitat Expansion Agreement	WP 3-90 to 91, Lines 1628,1708
46		Adjustment	-1,576		FERC Relicensing Projects	WP 3-90 to 94, Lines 1608,1609,1611,1612,1614,1615,1622-1627,1636,1853,1887
47		Adjustment	5,608		Drum Spaulding License Conditions	WP 3-90, Line 1613
48		Adjustment	-780		Phoenix Forebay Install Butterfly Valve	WP 3-94, Line 1889
49		Adjustment	-4,955		Spillway Assessment and Improvement Prgm Cap Mitigation	WP 3-90 to 94, Lines 1637-1648,1650,1651,1719, 1746,1747,1749,1750,1751,1758-1761,1796,1855
50		Misc Adjustment	-995		Net adjustment for yearly cost fluctuations on relicensing spending for other licenses	Remaining adjustments
51		**Total Net Change**	**31,136**			Sum of Lines 43-50
52						
53	**2029**	**Forecast**	**278,598**			Line 42 + Line 51 and WP 3-55, Line 8
54		Adjustment	17,025		Helms License Conditions	WP 3-94, Line 1884
55		Adjustment	-9,242		Kerckhoff 1 &2 License Conditions	WP 3-94, Line 1885
56		Adjustment	-10,315		Spillway Assessment and Improvement Prgm Cap Mitigation	WP 3-90 to 94, Lines 1637-1648,1650,1651,1719, 1746,1747,1749,1750,1751,1758-1761,1796,1855
57		Misc Adjustment	-1,293		Net adjustment for yearly cost fluctuations on relicensing spending for other licenses	Remaining adjustments
58		**Total Net Change**	**-3,825**			Sum of Lines 54-57
59						
60	**2030**	**Forecast**	**274,772**			Line 53 + Line 58 and WP 3-55, Line 8

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Line No.	Year	Program/Activity	Amount		Detailed Description/Assumptions	Reference From
1	**2024**	**Adjusted Recorded**	**4,338**			WP 3-55, Line 1
2		Misc Adjustment	-1,104		Reduction in overall tools and equipment forecast across all hydro areas	Remaining adjustments
3		**Total Net Change**	**-1,104**			Line 2
4						
5	**2025**	**Forecast**	**3,234**			Line 1 + Line 3 and WP 3-55, Line 1
		Adjustment	-2,284		NERC Compliance -- Capital Tools	WP 3-64, line 9
6		Misc Adjustment	-181		Net adjustment for yearly cost fluctuations in tools and equipments	Remaining adjustments
7		**Total Net Change**	**-2,465**			Line 6
8						
9	**2026**	**Forecast**	**769**			Line 5 + Line 7 and WP 3-55, Line 1
10		Misc Adjustment	267		Net adjustment for yearly cost fluctuations in tools and equipments	Remaining adjustments
11		**Total Net Change**	**267**			Line 10
12						
13	**2027**	**Forecast**	**1,036**			Line 9 + Line 11 and WP 3-55, Line 1
14		Misc Adjustment	63		Net adjustment for yearly cost fluctuations in tools and equipments	Remaining adjustments
15		**Total Net Change**	**63**			Line 14
16						
17	**2028**	**Forecast**	**1,099**			Line 13 + Line 15 and WP 3-55, Line 1
18		Misc Adjustment	272		Net adjustment for yearly cost fluctuations in tools and equipments	Remaining adjustments
19		**Total Net Change**	**272**			Line 18
20						
21	**2029**	**Forecast**	**1,371**			Line 17 + Line 19 and WP 3-55, Line 1
22		Misc Adjustment	-12		Net adjustment for yearly cost fluctuations in tools and equipments	Remaining adjustments
23		**Total Net Change**	**-12**			Line 22
24						
25	**2030**	**Forecast**	**1,358**			Line 21 + Line 23 and WP 3-55, Line 1

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Line No.	Year	Program/Activity	Amount		Detailed Description/Assumptions	Reference From
1	**2024**	**Adjusted Recorded**	**1,122**			WP 3-55, Line 2
2		Adjustment	-486		Battle Cr Salmon/Steelhead Phase 1A&2	WP 3-64, Line 17
3		Misc Adjustment	-36		Net adjustment for yearly cost fluctuations in relicensing related work	Remaining adjustments
4		**Total Net Change**	**-522**			Sum of Lines 2-3
5						
6	**2025**	**Forecast**	**600**			Line 1 + line 4 and WP 3-55, Line 2
7		Adjustment	565		Battle Cr Salmon/Steelhead Phase 1A&2	WP 3-64, Line 17
8		**Total Net Change**	**565**			Line 7
9						
10	**2026**	**Forecast**	**1,165**			Line 6 + Line 8 and WP 3-55, Line 2
11		Adjustment	376		Battle Cr Salmon/Steelhead Phase 1A&2	WP 3-64, Line 17
12		**Total Net Change**	**376**			Line 11
13						
14	**2027**	**Forecast**	**1,541**			Line 10 + Line 12 and WP 3-55, Line 2
15		Adjustment	-1,541		Battle Cr Salmon/Steelhead Phase 1A&2	WP 3-64, Line 17
16		**Total Net Change**	**-1,541**			Line 15
17						
18	**2028**	**Forecast**	**0**			Line 14 + Line 16 and WP 3-55, Line 2
19		**Total Net Change**	**0**			
20						
21	**2029**	**Forecast**	**0**			Line 18 + Line 19 and WP 3-55, Line 2
22		Misc Adjustment	0		Net adjustment for yearly cost fluctuations in relicensing related work	Remaining adjustments
23		**Total Net Change**	**0**			Line 22
24						
25	**2030**	**Forecast**	**0**			Line 21 + Line 23 and WP 3-55, Line 2

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Line No.	Year	Program/Activity	Amount		Detailed Description/Assumptions	Reference From
1	**2024**	**Adjusted Recorded**	**200**			WP 3-55, Line 3
2		Adjustment	-196		Haas Remove OSPP	WP 3-64, Line 24
3		Misc Adjustment	-3		Net adjustment for yearly cost fluctuations	Remaining adjustments
4		**Total Net Change**	**-200**			Sum of Lines 2-3
5						
6	**2025**	**Forecast**	**0**			Line 1 + Line 4 and WP 3-55, Line 3
7		Misc Adjustment	37		Net adjustment for yearly cost fluctuations	Remaining adjustments
8		**Total Net Change**	**37**			Line 7
9						
10	**2026**	**Forecast**	**37**			Line 6 + Line 8 and WP 3-55, Line 3
11		Adjustment	503		Haas Remove OSPP	WP 3-64, Line 24
12		**Total Net Change**	**503**			Line 11
13						
14	**2027**	**Forecast**	**540**			Line 10 + Line 12 and WP 3-55, Line 3
15		Adjustment	-460		Haas Remove OSPP	WP 3-64, Line 24
16		**Total Net Change**	**-460**			Line 15
17						
18	**2028**	**Forecast**	**80**			Line 14 + Line 16 and WP 3-55, Line 3
19		Adjustment	-80		Haas Remove OSPP	WP 3-64, Line 24
20		**Total Net Change**	**-80**			Line 19
21						
22	**2029**	**Forecast**	**0**			Line 18 + Line 20 and WP 3-55, Line 3
23		**Total Net Change**	**0**			
24						
25	**2030**	**Forecast**	**0**			Line 22 + Line 23 and WP 3-55, Line 3

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Line No.	Planning Order	Planning Order Description	Mitigation or Control Name	MWC	2027 Forecast ($000)	2028 Forecast ($000)	2029 Forecast ($000)	2030 Forecast ($000)	2027-2030 Forecast ($000)
1	**Large Uncontrolled Water Release (Dam Failure) - LGUWR**								
2	5794027	Butt Valley Spillway Improv SAIP	M002 - Spillway Remediation	3H	476	1,835	2,080	2,811	7,202
3	5794032	McCloud Spillway Improvements SAIP	M002 - Spillway Remediation	3H	8,357	104,660	120,235	124,865	358,117
4	5794035	Tiger Creek Reg Spillway Improv SAIP	M002 - Spillway Remediation	3H	42,197	19,776	7,676	3,701	73,351
5	5804599	Relief Dam Inst V. Surv/Sec Cams FSI	M005 - Physical Security	3H	837	34			871
6	5804963	Tiger Crk Reg Dam Inst V.Surv/SecCamsFSI	M005 - Physical Security	3H	35				35
7	5805416	Lake Almanor Spillway Joint Rpl SAIP -ST	M002 - Spillway Remediation	3H	7,190	6,422			13,612
8	5805998	Belden Dam Install Cameras FSI	M005 - Physical Security	3H	36	844	53		933
9	5805999	Bucks Lake Dam Inst Video Surv Upgr FSI	M005 - Physical Security	3H	289	807	39		1,135
10	5806000	Butt Valley Dam Inst Video Surv FSI	M005 - Physical Security	3H	35				35
11	5806002	Grizzly Dam Inst Video & Sec Upgr FSI	M005 - Physical Security	3H	289	807	39		1,135
12	5806003	Lake Almanor Dam Inst Video&Sec Upgr FSI	M005 - Physical Security	3H	35				35
13	5806004	Lwr Bucks Dam Inst Video & Sec Upgr FSI	M005 - Physical Security	3H	289	807	39		1,135
14	5806063	Pit 1 Fbay Inst V. Surv/Sec Cameras FSI	M005 - Physical Security	3H	749	43			791
15	5806064	Pit 1 Forebay Install Fencing FSI	M005 - Physical Security	3H	1,088				1,088
16	5806066	Pit 3 Lk Britton Inst V.Surv/Sec Cam FSI	M005 - Physical Security	3H	924	29			954
17	5806068	Pit 4 Div Dam Inst Cameras and IDS FSI	M005 - Physical Security	3H	289	807	39		1,135
18	5806070	Pit 5 Open Conduit Install Fencing FSI	M005 - Physical Security	3H	36	126	269		432
19	5806071	Pit 5 Dam and OC Install Cameras FSI	M005 - Physical Security	3H	36	278	915	35	1,265
20	5806120	Salt Spgs Dam Inst V. Surv/Sec Cams FSI	M005 - Physical Security	3H	289	807	39		1,135
21	5806621	Courtright Dam Video Surv Upgrade FSI	M005 - Physical Security	3H	1,092	45			1,137
22	5806622	Wishon Dam Inst Video Surv/Security FSI	M005 - Physical Security	3H	1,092	46			1,138
23	5806623	Courtright Comm Twr Inst V. Surv/Sec FSI	M005 - Physical Security	3H	377	1,053	51		1,481
24	5806700	Lake Tabeaud Spillway Retrofit	M002 - Spillway Remediation	3H		183	260	609	1,053
25	5806805	Butt Valley Wall Reinforcement SAIP - ST	M002 - Spillway Remediation	3H	238	275	312	1,874	2,699
26	5806806	Bucks Storage Erosion Protect SAIP - ST	M002 - Spillway Remediation	3H	238	459	1,040		1,737
27	5808125	Belden Spillway Imprv Walls SAIP IRRM	M002 - Spillway Remediation	3H	2,054	16,515	10,402	47	29,018
28	5808126	Cape Horn Erosion Protection - SAIP - ST	M002 - Spillway Remediation	3H	254	460	1,040		1,754
29	5808254	CV Dam Fencing Upgrade FSI	M005 - Physical Security	3H	153	1,049			1,202
30	5808255	CV Dam Video Surveillance Upgrade FSI	M005 - Physical Security	3H	289	807	39		1,135
31	5808256	Drum Fbay Dam Install Cameras FSI	M005 - Physical Security	3H	36	278	915	35	1,265
32	5808257	Lake Almanor Intake Inst Sec Upgr FSI	M005 - Physical Security	3H	109	317	40		466
33	5808282	Lake Almanor Spillway Improv SAIP LT	M002 - Spillway Remediation	3H	238	229	2,080	1,874	4,422
34	5808283	RV Spillway Armor Splash Pool SAIP IRRM	M002 - Spillway Remediation	3H	250	459	1,040		1,750
35	5808284	NBC Spillway Improvements SAIP LT	M002 - Spillway Remediation	3H				469	469

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Line No.	Planning Order	Planning Order Description	Mitigation or Control Name	MWC	2027 Forecast ($000)	2028 Forecast ($000)	2029 Forecast ($000)	2030 Forecast ($000)	2027-2030 Forecast ($000)
36	5808285	Belden Spillway Inst Log Boom SAIP IRRM	M002 - Spillway Remediation	3H	3,106	61			3,167
37	5808318	Lake Fordyce Install Cameras FSI	M005 - Physical Security	3H			40	284	324
38	5808319	Lake Valley Dam Install Cameras FSI	M005 - Physical Security	3H	289	807	39		1,135
39	5808320	Lower Bucks Lake Dam Install Fencing FSI	M005 - Physical Security	3H	153	1,049			1,202
40	5808321	Manzanita Dam Fencing Upgrade FSI	M005 - Physical Security	3H			168	1,072	1,239
41	5808322	Manzanita Dam Video Surv Upgrade FSI	M005 - Physical Security	3H			316	825	1,140
42	5808323	PV Scott Dam Install Cameras FSI	M005 - Physical Security	3H			316	825	1,140
43	5808324	PV Scott Dam Install Fencing Upgrade FSI	M005 - Physical Security	3H			168	1,072	1,239
44	5808325	Rock Creek Dam Desabla Inst Fencing FSI	M005 - Physical Security	3H	153	1,049			1,202
45	5808326	Rock Crk Inst Video & Security Upgr FSI	M005 - Physical Security	3H	837	34			871
46	5808327	Rucker Lake Dam Install Cameras FSI	M005 - Physical Security	3H		35	316	825	1,176
47	5808328	Rucker Lake Inst Fencing and Gate FSI	M005 - Physical Security	3H		35	168	1,072	1,275
48	5808329	Spaulding Dam 1 Install Cameras FSI	M005 - Physical Security	3H	289	807	39		1,135
49	5808330	Spaulding Dam 2 Install Access Gates FSI	M005 - Physical Security	3H	1,088				1,088
50	5808331	Spaulding Dam 2 Install Cameras FSI	M005 - Physical Security	3H	289	807	39		1,135
51	5808332	Upper Peak Lake Dam Install Cameras FSI	M005 - Physical Security	3H	36	278	915	35	1,265
52	5808333	Upper Peak Lake Upgrade Fencing FSI	M005 - Physical Security	3H	36	148	1,189		1,374
53	5808334	Wise Fbay Inst Video & Security Upgr FSI	M005 - Physical Security	3H		35	316	825	1,176
54	5808335	Belden Dam Intake Bldg Fencing FSI	M005 - Physical Security	3H		11	168	928	1,106
55	5808338	Halsey Fbay Dam Install Cameras FSI	M005 - Physical Security	3H	289	807	39		1,135
56	5808340	Lake Tabeaud Instl Video SurveillanceFSI	M005 - Physical Security	3H	36	278	915	35	1,265
57	5808341	Macumber Dam Inst Video & Sec Upg FSI	M005 - Physical Security	3H	36	278	915	35	1,265
58	5808342	Macumber Install Fencing FSI	M005 - Physical Security	3H	36	148	1,189		1,374
59	5808343	Cresta Dam Install Fencing FSI	M005 - Physical Security	3H	153	1,049			1,202
60	5808880	Belden Forebay Spillway Improv SAIP LT	M002 - Spillway Remediation	3H	238	229	520	469	1,456
61	5808931	Butt Valley Spillway Fencing FSI	M005 - Physical Security	3H		14	218	1,398	1,630
62	5808932	Butt Valley Prattville Intk Fencing FSI	M005 - Physical Security	3H		14	186	317	517
63	5808945	Lwr Bear Dam Inst Video Surv/SecCams FSI	M005 - Physical Security	3H	36	278	915	35	1,265
64	5808948	Strawberry Dam Intl Video Security FSI	M005 - Physical Security	3H	36	278	915	35	1,265
65	5809498	Strawberry Dam Fencing Upgrade FSI	M005 - Physical Security	3H	36	148	1,189		1,374
66	5809922	Salt Springs Dam Upgrade Sec Fencing FSI	M005 - Physical Security	3H	153	1,049			1,202
67	5811780	Lake Tabeaud Install Fencing FSI	M005 - Physical Security	3H	36	148	1,189		1,374
68	5812255	Spaulding Dam 2 Upgrade Fencing FSI	M005 - Physical Security	3H	1,088				1,088
69	5812256	Spaulding Dam 1 Upgrade Fencing FSI	M005 - Physical Security	3H	1,088				1,088
70	5812264	Drum Fbay Dam Upgrade Fencing FSI	M005 - Physical Security	3H	1,088				1,088

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Line No.	Planning Order	Planning Order Description	Mitigation or Control Name	MWC	2027 Forecast ($000)	2028 Forecast ($000)	2029 Forecast ($000)	2030 Forecast ($000)	2027-2030 Forecast ($000)
71	5812284	Lake Fordyce Dam Upgrade Fencing FSI	M005 - Physical Security	3H	36	148	1,189		1,374
72	5511186	DeSabla Inst/Repl Rsrvrs, Dams & Wtrwys	C001 - Maintenance	2N	115	122	152	151	540
73	5511187	Shasta Inst/Repl Rsrvrs, Dams & Wtrwys	C001 - Maintenance	2N	115	122	152	151	540
74	5511188	Drum Inst/Repl Rsrvrs, Dams & Wtrwys	C001 - Maintenance	2N	115	122	152	151	540
75	5511189	MLode Inst/Repl Rsrvrs, Dams & Wtrwys	C001 - Maintenance	2N	115	122	152	151	540
76	5745679	Fordyce Dam Leakage Reduction DOE	M001 - Internal Erosion Mitigation	2L	11,138	15,441	10,850		37,430
77	5771199	Pit 7 Radial Gate1 Repl Arms & Trunnions	M002 - Spillway Remediation	2L	2,829	12,320	102		15,251
78	5771200	Pit 6 Radial Gate1 Repl Arms & Trunnions	M002 - Spillway Remediation	2L	1,148	2,305	12,962	92	16,507
79	5774800	Crane Valley Dam-Intake Twr Seismic Upgr	M003 - Seismic Retrofit	2L	5,550	15			5,565
80	5776722	Pit 6 Radial Gate2 Repl Arms & Trunnions	M002 - Spillway Remediation	2L		317	1,608	2,811	4,736
81	5776723	Pit 7 Radial Gate2 Repl Arms & Trunnions	M002 - Spillway Remediation	2L	274	1,182	2,600	11,917	15,973
82	5778271	Lake Almanor Automate Instrumentation	F001 - Dam Safety Program	2N	38				38
83	5778272	Butt Valley Dam Automate Instrumentation	F001 - Dam Safety Program	2N	1,746				1,746
84	5779023	Spaulding Dam 1 Install Log Booms	M002 - Spillway Remediation	2N	1,441				1,441
85	5780885	Fordyce Dam Replace LLO and Guard Valves	M004 - LLO Refurbishment	2N	773	6,619	1,080	300	8,773
86	5783130	Balch 2 Repl 22" Needle Vlv Actuat & Wir	M004 - LLO Refurbishment	2M	70				70
87	5783541	Lower Bucks Dam Resurface DS Face	M001 - Internal Erosion Mitigation	2L	12,002	10,711	260		22,973
88	5784683	Rock Creek Cresta Coffer Dam DOE	M002 - Spillway Remediation	2N	75				75
89	5785096	Pit 3 LLO Replace No.1,2,3 Actuator	M004 - LLO Refurbishment	2N	29	3,119	3,121	94	6,362
90	5789325	CVD Repl Gates, Stems, Guides & Actuator	M004 - LLO Refurbishment	2L	5,651				5,651
91	5792573	McCloud Dam LLO Repl. 5x7 SG Actuator	M004 - LLO Refurbishment	2N	143	195	2,426	47	2,810
92	5792673	Rock Cr Dam Repl Radial BP Gate Hoist	M002 - Spillway Remediation	2N	105	252	1,716		2,073
93	5792676	Rock Creek Dam Replace Stilling Wells	F001 - Dam Safety Program	2N	1,425	28			1,453
94	5793584	Halsey Afterbay Dam Inflow Design Flood	F001 - Dam Safety Program	2N	95				95
95	5798438	Relief Dam Resurface Upstream Liner	M001 - Internal Erosion Mitigation	2N	3,780	18,071	18,098	19,211	59,161
96	5798439	Manzanita Dam Refrurbish LLO	M004 - LLO Refurbishment	2N	9				9
97	5800748	Pit 3 Dam Rest Plunge Pool & Wing Wall	M002 - Spillway Remediation	2N	407	7,106	26		7,539
98	5802602	Pit 7 Dam Radial Gate Chain Replacement	M002 - Spillway Remediation	2N	42	4	3		50
99	5802603	Pit 6 Dam Radial Gate Chain Replacement	M002 - Spillway Remediation	2N	38				38
100	5802821	Upper Peak Mitigate Seismic Deformation	M003 - Seismic Retrofit	2N	3,749	101			3,850
101	5802829	Wishon Dam Install Seismic Monitoring	F001 - Dam Safety Program	2L	21				21
102	5802830	Courtright Dam Seismic Monitoring	F001 - Dam Safety Program	2L	119				119
103	5802878	Belden Intake Structure Seismic Improve	M003 - Seismic Retrofit	2N	238	275	312	4,686	5,511
104	5802899	Fordyce Dam Replace Radial Gate Actuator	M002 - Spillway Remediation	2N	162	1,579	76		1,816
105	5803993	Pit 1 Forebay Dam Restore Upstream Slope	M001 - Internal Erosion Mitigation	2N			681	136	817

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106	5804217	McCloud Dam Replace Log Boom	M002 - Spillway Remediation	2N	951	92			1,043
107	5805970	Pit 6 Dam Replace Debris Boom	M002 - Spillway Remediation	2N	48				48
108	5805971	Pit 4 Dam Debris Boom Replacement	M002 - Spillway Remediation	2N	1,888	46			1,934
109	5806395	Wise FB Install Rip Rap	M001 - Internal Erosion Mitigation	2N		183	1,560	23	1,767
110	5806779	Relief Dam Install Log Boom	M002 - Spillway Remediation	2N	48	321			369
111	5806780	Relief Spillway Impr Lower Training Wall	M002 - Spillway Remediation	2N	285	688	2,600	2,343	5,917
112	5806782	Lower Bear Dam 1 Erosion Protection	M002 - Spillway Remediation	2N		183	676		860
113	5806819	Rock Creek Dam Replace Gate Control RTUs	M002 - Spillway Remediation	2M	547				547
114	5806841	Cresta Dam Replace Gate Control RTUs	M002 - Spillway Remediation	2M	552				552
115	5807220	Spaulding Dam 1 Replace LLO	M004 - LLO Refurbishment	2N	20,251	14,476	11,747	539	47,013
116	5808116	Rock Creek Dam Recoat Radial BP Gate GIR	M002 - Spillway Remediation	2L			104	843	947
117	5808117	Lower Bear Dam Recoat Radial Gate GIR	M002 - Spillway Remediation	2L			520		520
118	5808200	Belden Dam Recoat Radial Gates GIR	M002 - Spillway Remediation	2L				187	187
119	5808204	Pit 1 Dam Recoat Radial Gate 5 GIR	M002 - Spillway Remediation	2L	190	275	1,664	19	2,149
120	5808205	Pit 6 Dam Recoat Radial Gate GIR	M002 - Spillway Remediation	2L		138	988	890	2,016
121	5808206	Pit 7 Dam Recoat Radial Gates GIR	M002 - Spillway Remediation	2L			104	278	382
122	5808207	Cresta Dam Recoat Drum Gate 1	M002 - Spillway Remediation	2N	24				24
123	5808620	Blue Lake Dam Install Log Boom	M002 - Spillway Remediation	2N	238	229	10		478
124	5808621	Kidd Lake Dam Install Log Boom	M002 - Spillway Remediation	2N	622	5			627
125	5808703	Pit 1 Fbay Dam Rep Gates 4 & 5 Chains	M002 - Spillway Remediation	2N	76	138	624		838
126	5808805	Wishon Dam Recoat Radial Gates GIR	M002 - Spillway Remediation	2N	71				71
127	5809663	Lyons Dam Restore Toe Void	M002 - Spillway Remediation	2N	710	18			728
128	5809987	Strawberry LLO Replace Rockfall Netting	M001 - Internal Erosion Mitigation	2N	143	183			326
129	5809988	Strawberry Intake Tower Guide Valve Rlpc	M004 - LLO Refurbishment	2N	238				238
130	5811973	Iron Cayon Dam Inst Instru ADAS	F001 - Dam Safety Program	2N				234	234
131	5811974	Pit 7 Dam Inst Instru ADAS	F001 - Dam Safety Program	2N				234	234
132	5811975	Pit 1 Dam Inst Instru ADAS	F001 - Dam Safety Program	2N				234	234
133	5811976	Pit 6 Dam Inst Instru ADAS	F001 - Dam Safety Program	2N				234	234
134	5812074	Spaulding Dam 2 Rplc Gate Hoist 8 -10	M002 - Spillway Remediation	2N			780	1,406	2,186
135	5812076	Upper Peak Dam Install Log Boom	M002 - Spillway Remediation	2N				47	47
136	5812077	Rucker Lake Dam Install Log Boom	M002 - Spillway Remediation	2N				70	70
137	5812082	Spaulding 3 Aux Spillway Inst Log Boom	M002 - Spillway Remediation	2N	143	23			166
138	5812083	Spaulding 2 Dam Rock Anchorage	M002 - Spillway Remediation	2N	143	92	260	14	509
139	5812099	Relief Dam U/S Liner Patching 2027	M001 - Internal Erosion Mitigation	2N	761				761
140	5812113	Salt Springs Dam Rplc 12 Gate Hoist	M002 - Spillway Remediation	2M	713	2,752	4,681		8,147

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141	5812184	Crane Valley Dam Replace Needle Valve	M004 - LLO Refurbishment	2N				703	703
142	5812200	Helms - Wishon Dam Replace HB Valve	M004 - LLO Refurbishment	2N				703	703
143	5812246	Dam Safety Camera (HAWC Cameras)	M005 - Physical Security	2P			1,560	1,406	2,966
144	5812248	Belden Dam Repl Radial Gates Hoist	M002 - Spillway Remediation	2N			780	2,811	3,592
145	5812254	Bucks Storage Dam Intake Tower Retrofit	M003 - Seismic Retrofit	2M		459	780	1,406	2,645
146	5812262	Butt Valley Pratville Intk Seismic Imprv	M003 - Seismic Retrofit	2P			104	234	338
147	5812319	Cresta Dam Inst Instru ADAS	F001 - Dam Safety Program	2N				234	234
148	5812320	Cresta Dam Restore LLO & Dredge	M004 - LLO Refurbishment	2N	143	183	208	469	1,003
149	5812324	Lake Almanor Dam Intake Tower Retrofit	M003 - Seismic Retrofit	2N	238	229	1,560	4,217	6,245
150	5812325	Lake Almanor LLO Retrofit Disc Structure	M004 - LLO Refurbishment	2N				234	234
151	5812326	Lower Bucks Dam Abandon Intake Tower	M003 - Seismic Retrofit	2N				469	469
152	5812328	Philbrook Dam Inst Instru ADAS	F001 - Dam Safety Program	2N				234	234
153	5812331	Rock Creek Dam Inst Instru ADAS	F001 - Dam Safety Program	2N				234	234
154	5812332	Rock Creek Dam Restore LLO & Dredge	M004 - LLO Refurbishment	2N	143	183	208	469	1,003
155									
156									
157			**LGUWR Total**		**163,285**	**271,316**	**250,271**	**207,723**	**892,594**
158									
159	**Extended Unplanned Shutdown of a Critical Power Generation Asset (GSHUT)**								
160	5792763	Caribou 1 Install Fencing FSI	M2 - Component Replacement or Repair Electrical	3H	153	1,343			1,496
161	5802883	Caribou 1 Inst Video & Security Upgr FSI	M2 - Component Replacement or Repair Electrical	3H	243	1,128	28		1,399
162	5802884	Rock Creek PH SC Inst Video&Sec Upgr FSI	M2 - Component Replacement or Repair Electrical	3H	8				8
163	5806065	Pit 1 PH Inst Video Surv/Sec Cameras FSI	M2 - Component Replacement or Repair Electrical	3H	1,633	60			1,693
164	5806067	Pit 3 VH Inst Security Upgrades FSI	M2 - Component Replacement or Repair Electrical	3H	109	281	40		431
165	5806069	Pit 4 PH Install Fencing FSI	M2 - Component Replacement or Repair Electrical	3H	153	1,343			1,496
166	5806121	Salt Spgs PH Inst V. Surv/Sec Cams FSI	M2 - Component Replacement or Repair Electrical	3H		278	915	35	1,229
167	5808359	Helms Switchyard Video Surv - FSI	M2 - Component Replacement or Repair Electrical	3H	1,377	401			1,778
168	5808906	Caribou 2 Intk Inst Video & Sec Upgr FSI	M2 - Component Replacement or Repair Electrical	3H	109	317	40		466
169	5808907	Caribou 2 PH Inst Video & Sec Upgr FSI	M2 - Component Replacement or Repair Electrical	3H	243	1,128	28		1,399
170	5808908	Caribou 2 PH Install Fencing FSI	M2 - Component Replacement or Repair Electrical	3H	153	1,343			1,496
171	5808911	Caribou 2 Adit 1 Fencing FSI	M2 - Component Replacement or Repair Electrical	3H			143	243	385
172	5808915	Cresta Elephant Butte Adit Fencing FSI	M2 - Component Replacement or Repair Electrical	3H			218	1,789	2,007
173	5808916	Cresta Bear Creek Adit Fencing FSI	M2 - Component Replacement or Repair Electrical	3H			186	317	503
174	5808917	Cresta PH Install Fencing FSI	M2 - Component Replacement or Repair Electrical	3H		11	168	1,372	1,550
175	5808924	Belden PH Inst Video & Security Upgr FSI	M2 - Component Replacement or Repair Electrical	3H	243	1,128	28		1,399

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176	5808925	Belden PH Install Fencing FSI	M2 - Component Replacement or Repair Electrical	3H		11	168	1,372	1,550
177	5808927	Butt Valley PH Inst Video & Sec Upgr FSI	M2 - Component Replacement or Repair Electrical	3H	25				25
178	5808928	Butt Valley PH Install Fencing FSI	M2 - Component Replacement or Repair Electrical	3H		11	168	1,372	1,550
179	5808929	Butt Valley VH Surveillance FSI	M2 - Component Replacement or Repair Electrical	3H	255	35			290
180	5808930	Butt Valley Surge Tank Fencing FSI	M2 - Component Replacement or Repair Electrical	3H		14	186	317	517
181	5808933	Butt Valley VH Fencing FSI	M2 - Component Replacement or Repair Electrical	3H		14	186	317	517
182	5808934	BV Scada Bldg & Intk Inst Fencing FSI	M2 - Component Replacement or Repair Electrical	3H		11	143	243	396
183	5808935	Caribou 1 Intk Inst Video Surv FSI	M2 - Component Replacement or Repair Electrical	3H	109	317	40		466
184	5808943	Electra PH inst Video Surv/Sec Cams FSI	M2 - Component Replacement or Repair Electrical	3H	1,169	24			1,194
185	5808944	Tiger Creek PH Inst V. Surv/Sec Cams FSI	M2 - Component Replacement or Repair Electrical	3H	36	235	1,279		1,550
186	5808959	Caribou 1 Adit 1 Fencing FSI	M2 - Component Replacement or Repair Electrical	3H			186	317	503
187	5808960	Caribou 1 Adit 2 Fencing FSI	M2 - Component Replacement or Repair Electrical	3H			143	243	385
188	5808978	Cresta VH Video & Sec Upgr FSI	M2 - Component Replacement or Repair Electrical	3H	109	281	40		431
189	5808979	Grizzly PH Inst Video & Sec Upgr FSI	M2 - Component Replacement or Repair Electrical	3H	243	1,128	28		1,399
190	5808981	Rock Creek VH Inst Video & Sec Upgr FSI	M2 - Component Replacement or Repair Electrical	3H	109	281	40		431
191	5808982	Rock Creek Chambers Crk Adit Fencing FSI	M2 - Component Replacement or Repair Electrical	3H			143	243	385
192	5808983	Rock Creek Jackass Crk Adit Fencing FSI	M2 - Component Replacement or Repair Electrical	3H			143	243	385
193	5808985	Pit 4 PH Inst Cameras FSI	M2 - Component Replacement or Repair Electrical	3H	243	1,128	28		1,399
194	5808986	Pit 1 Surge Tank Surveillance FSI	M2 - Component Replacement or Repair Electrical	3H	797	48			845
195	5808992	Spaulding PH 1 Install Cameras FSI	M2 - Component Replacement or Repair Electrical	3H	243	1,128	28		1,399
196	5808993	Spaulding PH 2 Install Cameras FSI	M2 - Component Replacement or Repair Electrical	3H	243	1,128	28		1,399
197	5809574	Tiger Creek VH Inst Video Surv FSI	M2 - Component Replacement or Repair Electrical	3H	109	281	40		431
198	5809575	Tiger Creek PH Upgrade Fencing FSI	M2 - Component Replacement or Repair Electrical	3H	153	1,343			1,496
199	5809838	Drum SW Ctr Inst Video Surveillance FSI	M2 - Component Replacement or Repair Electrical	3H	1,169	24			1,194
200	5812258	Drum 1 PH Upgrade Fencing FSI	M2 - Component Replacement or Repair Electrical	3H	1,088				1,088
201	5812259	Drum 2 PH Video & Security Upgrade FSI	M2 - Component Replacement or Repair Electrical	3H	36	278	915	35	1,265
202	5812260	Drum 2 PH Upgrade Fencing FSI	M2 - Component Replacement or Repair Electrical	3H	36	235	1,279	25	1,575
203	5812265	Pit 1 Valvehouse Fencing Upgrade FSI	M2 - Component Replacement or Repair Electrical	3H	321				321
204	5812266	Pit 1 PH Fencing Upgrade FSI	M2 - Component Replacement or Repair Electrical	3H	1,504				1,504
205	5812268	Pit 4 VH Inst Cameras and IDS FSI	M2 - Component Replacement or Repair Electrical	3H	292	35			327
206	5812272	Belden FB Adit Fencing FSI	M2 - Component Replacement or Repair Electrical	3H			143	243	385
207	5812273	Bucks Lake VH Security Upgrade FSI	M2 - Component Replacement or Repair Electrical	3H	109	281	40		431
208	5812274	Caribou 2 Valvehouse Security Upgr FSI	M2 - Component Replacement or Repair Electrical	3H	109	281	40		431
209	5812279	Grizzly Valvehouse Security Upgrade FSI	M2 - Component Replacement or Repair Electrical	3H	109	281	40		431
210	5812281	Helms Switchyard Fencing Upgrade FSI	M2 - Component Replacement or Repair Electrical	3H	1,088				1,088

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211	5812282	Helms T2 Tunnel Upg Vehic Gate FSI	M2 - Component Replacement or Repair Electrical	3H	246				246
212	5812283	Helms Surge Chamber Install Cameras FSI	M2 - Component Replacement or Repair Electrical	3H	328	35			363
213	5500312	Shasta Purchase Capital Tools/Eqpt	M3 - Component Replacement or Repair Mechanical	05	173	183	228	226	811
214	5500313	DeSabla Purchase Capital Tools/Eqpt	M3 - Component Replacement or Repair Mechanical	05	173	183	228	226	811
215	5500314	Drum Central Purchase Capital Tools	M3 - Component Replacement or Repair Mechanical	05	173	183	228	226	811
216	5500315	MLode Purchase Capital Tools/Eqpt	M3 - Component Replacement or Repair Mechanical	05	173	183	228	226	811
217	5500316	KCV Purchase Capital Tools/Eqpt	M3 - Component Replacement or Repair Mechanical	05	173	183	228	226	811
218	5500317	Helms Purchase Capital Tools/Eqpt	M3 - Component Replacement or Repair Mechanical	05	173	183	228	226	811
219	5500325	Shasta Inst/Repl Hydro Generating Equip	M3 - Component Replacement or Repair Mechanical	2M	1,036	1,099	1,371	1,358	4,864
220	5500327	Drum Inst/Repl Hydro Generating Equip	M3 - Component Replacement or Repair Mechanical	2M	1,036	1,099	1,371	1,358	4,864
221	5500328	MLode Inst/Repl Hydro Generating Equip	M3 - Component Replacement or Repair Mechanical	2M	1,036	1,099	1,371	1,358	4,864
222	5501133	DeSabla Repl Obsol/Deteriorated Eqpt/Fac	M2 - Component Replacement or Repair Electrical	2M	1,036	1,099	1,371	1,358	4,864
223	5502519	KCV Replace Obsolete/Deteriorated Eqpt	M2 - Component Replacement or Repair Electrical	2M	1,057	1,099	1,371	1,358	4,885
224	5502521	Helms Repl Obsolete/Deteriorated Eqpt	M2 - Component Replacement or Repair Electrical	2M	1,036	1,099	1,371	1,358	4,864
225	5720513	Salt Springs 1 Rewind Generator	M2 - Component Replacement or Repair Electrical	2M		67	1,682	5,657	7,406
226	5720657	Caribou 1 PH Rewind U2	M2 - Component Replacement or Repair Electrical	2M	9,244	459			9,703
227	5720696	Pit 4 PH U1 Upgr Runner WG & Seal Rings	M3 - Component Replacement or Repair Mechanical	2M		229	580	2,062	2,872
228	5720716	Pit 7 U1 Replace Runner	M3 - Component Replacement or Repair Mechanical	2M	143	275	1,248	7,685	9,351
229	5720717	Pit 7 U2 Replace Runner	M3 - Component Replacement or Repair Mechanical	2M		138	312	1,125	1,574
230	5720719	Pit 6 PH U1 Upgrade Turbine	M3 - Component Replacement or Repair Mechanical	2M	659	564	4,388	7,781	13,392
231	5720720	Pit 6 PH U2 Upgrade Turbine	M3 - Component Replacement or Repair Mechanical	2M	3,793	564	4,388	7,781	16,526
232	5720726	Caribou 1 U2 Repl Runners-Bearing-Shaft	M3 - Component Replacement or Repair Mechanical	2M	13,329	3,874			17,203
233	5720727	Caribou 1 U3 Repl Rnnr, Brng, Shft & Ndl	M3 - Component Replacement or Repair Mechanical	2M	95	1,147	5,201	7,029	13,472
234	5720747	Pit 4 U1 Rewind Generator Stator	M2 - Component Replacement or Repair Electrical	2M	143	1,376	5,721	5,389	12,629
235	5734298	Caribou 1 PH Upg U2 Governor Controls	M2 - Component Replacement or Repair Electrical	2M	3,595	734			4,329
236	5739698	Balch 1 - Replace Governor	M2 - Component Replacement or Repair Electrical	2M	572	2,081	683		3,336
237	5745715	Salt Springs 2 Repl Runner,Needles,Seats	M3 - Component Replacement or Repair Mechanical	2M	951	2,723	256		3,930
238	5747215	Drum Unit 1 Rewind	M2 - Component Replacement or Repair Electrical	2M				281	281
239	5747216	Drum Unit 3 Rewind	M2 - Component Replacement or Repair Electrical	2M				281	281
240	5751038	Kerckhoff 2 - Replace CO2 System	M3 - Component Replacement or Repair Mechanical	2L	6,120				6,120
241	5758119	Balch 2 - U2 Repl Cooling Water Piping	M3 - Component Replacement or Repair Mechanical	2M	998				998
242	5759145	Kerckhoff 2 - Kerckhoff 2 – Overhaul Wic	M3 - Component Replacement or Repair Mechanical	2M		309	376	2,183	2,868
243	5760010	Pit 3 Replace Neutral Transformers	M2 - Component Replacement or Repair Electrical	2M	62				62
244	5760011	Pit 3 Powerhouse Replace AC/DC Panel	M2 - Component Replacement or Repair Electrical	2M	1,930				1,930
245	5760154	Spaulding 1 TSV Refurbishment	M3 - Component Replacement or Repair Mechanical	2M	728	3,929	204		4,860

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246	5760159	Stanislaus CO2 Fire Protection Systems	M3 - Component Replacement or Repair Mechanical	2L	100	298	2,158	304	2,860
247	5760167	Cresta PH Replace U1 Exciter	M2 - Component Replacement or Repair Electrical	2M	2,794	306	46		3,146
248	5760169	Cresta PSV Aux Equip Replace/Rebuild	M3 - Component Replacement or Repair Mechanical	2N	110	378	416		904
249	5760630	Caribou 1 Refurb PSV Aux Equip	M2 - Component Replacement or Repair Electrical	2M				75	75
250	5760650	Cresta PH Crane Upgrade	M1 - Component Replacement or Repair Civil	2M	6,176				6,176
251	5760651	Cresta U1 PRV Replace Energy Dissipaters	M1 - Component Replacement or Repair Civil	2M	10	950	520		1,480
252	5760652	Cresta PH Replace U2 Exciter	M2 - Component Replacement or Repair Electrical	2M	3,003	340	414	49	3,806
253	5760662	Drum 1 U2 Rewind	M2 - Component Replacement or Repair Electrical	2M				281	281
254	5760669	Drum 2 U5 Rewind	M2 - Component Replacement or Repair Electrical	2M	7,703	2,294			9,997
255	5760680	Electra U1 Governors and Servos Refurb	M3 - Component Replacement or Repair Mechanical	2M	190	183	1,664	94	2,132
256	5760681	Electra U2 Governors and Servos Refurb	M3 - Component Replacement or Repair Mechanical	2M		183	208	1,499	1,891
257	5760721	Rock Cr VH Upg Aux Equipment	M3 - Component Replacement or Repair Mechanical	2M	951	459			1,410
258	5760722	Salt Springs 2 Repl Accum & PSV cntrls	M1 - Component Replacement or Repair Civil	2M	476	3,011	256		3,743
259	5761119	Pit 1 U2 Upgrade Generator Relays	M2 - Component Replacement or Repair Electrical	2M	2,054				2,054
260	5762318	Pit 4 U1 Replace Excitation System	M2 - Component Replacement or Repair Electrical	2M		138	798	1,046	1,981
261	5762319	Pit 4 U2 Replace Excitation System	M2 - Component Replacement or Repair Electrical	2M			52	328	380
262	5762321	Pit 5 U2 Replace Excitation System	M2 - Component Replacement or Repair Electrical	2M	48	289	719	1,469	2,525
263	5762322	Pit 5 U3 Replace Excitation System	M2 - Component Replacement or Repair Electrical	2M		46	354	712	1,112
264	5762323	Pit 5 U4 Replace Excitation System	M2 - Component Replacement or Repair Electrical	2M			52	328	380
265	5762324	Pit 3 PH U2 Upgr Runner WG & Seal Rings	M3 - Component Replacement or Repair Mechanical	2M	5,970	3,561	3,113	106	12,750
266	5762326	Pit 3 PH U3 Upgr Runner WG & Seal Rings	M3 - Component Replacement or Repair Mechanical	2M		183	520	1,125	1,828
267	5762329	Kerckhoff 2 - Generator Rewind/Restack	M2 - Component Replacement or Repair Electrical	2M		459	2,080	4,686	7,225
268	5765059	Balch 2 - U3 Repl TSV Actuator Seal	M3 - Component Replacement or Repair Mechanical	2M		112	531	60	703
269	5766154	JBB PH U1 Upgrade Governor Controls	M2 - Component Replacement or Repair Electrical	2M	71				71
270	5766242	Drum U5 Install RTD	M2 - Component Replacement or Repair Electrical	2M	576	828			1,404
271	5766243	Tiger Creek U2 Repl Generator Relays	M2 - Component Replacement or Repair Electrical	2M	1,289				1,289
272	5766244	Drum U5 Cooling Water Flow meters	M3 - Component Replacement or Repair Mechanical	2M	381	550			932
273	5767981	Caribou 1 U3 Upgrade Gov Controls	M2 - Component Replacement or Repair Electrical	2M	239	1,376	3,121		4,736
274	5768238	Drum Canal Pittman Flume Structural Impr	M1 - Component Replacement or Repair Civil	2M	867				867
275	5777373	JBB U1 Replace CT, PT, SA & Bus Duct	M2 - Component Replacement or Repair Electrical	2M	120				120
276	5778043	Helms - U1 Repl TSV	M3 - Component Replacement or Repair Mechanical	2M	2,774	13,156	1,857		17,788
277	5778044	Helms - U2 Repl TSV	M3 - Component Replacement or Repair Mechanical	2M	2,854	13,242	1,876		17,972
278	5778045	Helms - U3 Repl TSV	M3 - Component Replacement or Repair Mechanical	2M	3,464				3,464
279	5778900	Tiger Creek U2 Rewind	M2 - Component Replacement or Repair Electrical	2M	4,384				4,384
280	5778920	Electra U2 Convert to Digital Governor	M2 - Component Replacement or Repair Electrical	2M	71	367	520	937	1,896

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281	5778921	Electra U3 Convert to Digital Governor	M2 - Component Replacement or Repair Electrical	2M		321	520	1,687	2,528
282	5778922	Electra U1 Convert to Digital Governor	M2 - Component Replacement or Repair Electrical	2M	381	459	1,040	469	2,348
283	5779418	Balch 1 - Replace PSV	M3 - Component Replacement or Repair Mechanical	2M	3,783	1,390			5,173
284	5779419	Balch 1 Replace Cooling Wtr Tank Control	M2 - Component Replacement or Repair Electrical	2P	44	1,228	841		2,113
285	5779420	Balch 1 Wheel Pit Liner	M1 - Component Replacement or Repair Civil	2M	17	471	97		585
286	5779424	Bucks Cr PH Repl U1 Bearings and Shaft	M3 - Component Replacement or Repair Mechanical	2M		138	1,560	2,343	4,041
287	5779428	Cresta VH Refurb Sluice Valve	M3 - Component Replacement or Repair Mechanical	2M		279	208		487
288	5779431	Haas U1 Replace TSV Seats	M3 - Component Replacement or Repair Mechanical	2M	381	92			472
289	5779434	Haas U2 Replace TSV Seats	M3 - Component Replacement or Repair Mechanical	2M	1,660	427			2,087
290	5779443	K2 - Replace Governor	M3 - Component Replacement or Repair Mechanical	2M	115	481			596
291	5779444	K2 Replace Turbine Runner	M3 - Component Replacement or Repair Mechanical	2M			130	2,811	2,941
292	5779464	Poe U1 & U2 Repl TSV Cylinders	M3 - Component Replacement or Repair Mechanical	2M		183	208	469	860
293	5779526	Poe PH Trxfmr Repl Bank 1	M2 - Component Replacement or Repair Electrical	2M	1,129	1,674	1,872		4,676
294	5779527	Poe PH Refurb U2 PRV	M3 - Component Replacement or Repair Mechanical	2M	190	459	1,040	1,593	3,282
295	5779575	Electra PH Crane Modernization	M1 - Component Replacement or Repair Civil	2P		1,835	2,080		3,915
296	5779577	Salt Springs PH Crane Modernization	M1 - Component Replacement or Repair Civil	2P	2,144	76			2,220
297	5780659	Balch 2 - Bank 3 Replacement	M2 - Component Replacement or Repair Electrical	2M	5,626	2,130			7,757
298	5780661	Balch 2 - U2 Repl Transfrmr Mgmt Relays	M2 - Component Replacement or Repair Electrical	2M	865	341			1,207
299	5780662	Balch 2 - U3 Repl Transfrmr Mgmt Relays	M2 - Component Replacement or Repair Electrical	2M	865	343			1,208
300	5780667	Helms - U1 InstlThrst Bracket LoadCells	M3 - Component Replacement or Repair Mechanical	2M	234	-	-	-	234
301	5780669	Helms - U3 InstlThrst Bracket LoadCells	M3 - Component Replacement or Repair Mechanical	2M	649				649
302	5780671	Helms - U1 Replace Turbine Gage Board	M3 - Component Replacement or Repair Mechanical	2M	305	473			778
303	5780672	Helms - U2 Replace Turbine Gage Board	M3 - Component Replacement or Repair Mechanical	2M	346	449	96		891
304	5780673	Helms - U3 Replace Turbine Gage Board	M3 - Component Replacement or Repair Mechanical	2M	304	470			775
305	5780675	Helms - Draft Tube Gate Improvements	M3 - Component Replacement or Repair Mechanical	2M	72	356	105	101	633
306	5780698	Kings River - Repl Transfrmr Mgmt Relays	M2 - Component Replacement or Repair Electrical	2M	67	321	52		440
307	5781162	Cresta PH U2 Rewind	M2 - Component Replacement or Repair Electrical	2M	(0)	(0)	125	9,372	9,496
308	5781191	JBB U2 Replace CT, PT, SA & Bus Duct	M2 - Component Replacement or Repair Electrical	2M		229	2,262	2,140	4,632
309	5782678	Poe PH U1 Upgrade Gen Mgmt Relay Pkg	M2 - Component Replacement or Repair Electrical	2L	309	908	1,144		2,362
310	5782679	Poe PH U2 Upgrade Gen Mgmt Relay Pkg	M2 - Component Replacement or Repair Electrical	2L		101	224	502	827
311	5782985	Cresta PH U1 Install Bearing Monitoring	M3 - Component Replacement or Repair Mechanical	2M			208	469	677
312	5782996	Poe PH Replace Station Service Trans No1	M2 - Component Replacement or Repair Electrical	2M	428	468			896
313	5783073	Salt Springs 2 Repl Coils, RTDs, Bearing	M3 - Component Replacement or Repair Mechanical	2M	476	2,569	156		3,201
314	5783123	Helms Install Backup Power at Portal	M2 - Component Replacement or Repair Electrical	2P	2,413	4,688	461		7,562
315	5783125	Helms Replace 13.8kV Breakers	M2 - Component Replacement or Repair Electrical	2M	313				313

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316	5783132	Balch 2 U2 Install Duplex Strainers	M3 - Component Replacement or Repair Mechanical	2M			187	15	202
317	5783134	Balch 2 U3 Governor Component Lifecycle	M2 - Component Replacement or Repair Electrical	2M		259	992	57	1,308
318	5783238	Drum 2 U5 Replace Generator Relays	M2 - Component Replacement or Repair Electrical	2M	318	1,471			1,788
319	5785782	Balch 2 U3 Install Duplex Strainers	M3 - Component Replacement or Repair Mechanical	2M			229	74	303
320	5785794	Balch 2 U3 Replace Bearing Cooling Coil	M3 - Component Replacement or Repair Mechanical	2M			1,424	199	1,623
321	5785860	Balch 2 Black Start High Lift Conversion	M3 - Component Replacement or Repair Mechanical	2M	672	45			717
322	5786879	Helms - U1 Repl Turbine Equalizing Line	M3 - Component Replacement or Repair Mechanical	2M	33				33
323	5786880	Helms - U3 Repl Turbine Equalizing Line	M3 - Component Replacement or Repair Mechanical	2M	60				60
324	5787738	Poe PH SS Rock Slide Mitigate Erosion	M1 - Component Replacement or Repair Civil	2P	20	20	1,049		1,089
325	5788224	Helms PH to Swyd Control Wiring Rpl	M2 - Component Replacement or Repair Electrical	2M	951				951
326	5788228	Balch 2 Bank 2 Replacement	M2 - Component Replacement or Repair Electrical	2M	6,501	1,384			7,885
327	5788247	Poe GSU Transformer Repl Bank 2	M2 - Component Replacement or Repair Electrical	2M	190	275	1,560	2,343	4,369
328	5791558	Haas – Upgrade Crane Controls	M2 - Component Replacement or Repair Electrical	2P	566	3,707			4,272
329	5792458	Pit 4 PH Upgrade Crane(s)	M2 - Component Replacement or Repair Electrical	2P	5,285				5,285
330	5792563	JBB Willow Creek Rd Stabilization	M1 - Component Replacement or Repair Civil	2P	95				95
331	5792566	Pit 1 Forebay Manufacture Stop Logs	M1 - Component Replacement or Repair Civil	2N	285				285
332	5792568	Lake Britton Upgrade RTU	M2 - Component Replacement or Repair Electrical	2M				234	234
333	5792577	Pit 3 PH Replace Gen CTs & Bus SWs	M2 - Component Replacement or Repair Electrical	2M	61				61
334	5792578	Pit 6 Install Inverter for HPOL's	M2 - Component Replacement or Repair Electrical	2M	95				95
335	5792579	JBB Install Inverter for HPOL's	M2 - Component Replacement or Repair Electrical	2M	476				476
336	5792583	Pit 3 PH Install Wye PTs & Switch	M2 - Component Replacement or Repair Electrical	2L	95				95
337	5792672	Bucks Creek Pnstk Upgr Erosion Protect	M1 - Component Replacement or Repair Civil	2N	3,086				3,086
338	5792677	Bucks Creek Replace 11.5kV Aux Cubicles	M2 - Component Replacement or Repair Electrical	2L	335				335
339	5792691	Stanislaus Replace TSV Control	M3 - Component Replacement or Repair Mechanical	2M	1,158				1,158
340	5792734	Balch 1 Replace Stator Louver Controls	M2 - Component Replacement or Repair Electrical	2M		1,056	557		1,613
341	5792735	Drum 2 U5 Repl CCVT	M2 - Component Replacement or Repair Electrical	2M	96	138			233
342	5792740	Haas Replace PSV Seat	M3 - Component Replacement or Repair Mechanical	2M	1,358	285			1,643
343	5792742	Haas Install ISO Phase Maint Platform	M3 - Component Replacement or Repair Mechanical	2M	2,691				2,691
344	5792743	Helms - Repl Zone 12 Fire Protect Sys	M3 - Component Replacement or Repair Mechanical	2L	234	239	2,253		2,726
345	5792750	Helms - U2 Repl Demin Cooling Water Sys	M3 - Component Replacement or Repair Mechanical	2M	664	76			740
346	5792751	Balch - Replace Sandtrap Valves	M3 - Component Replacement or Repair Mechanical	2M	1,001	659			1,660
347	5792766	Butt Valley TSV/Mech Overspeed Upgrade	M3 - Component Replacement or Repair Mechanical	2M			104	234	338
348	5792938	Kings River GSU Bank Replacement	M2 - Component Replacement or Repair Electrical	2M	599	2,530	15		3,144
349	5792943	Kings River Rotor Pole Refurb	M3 - Component Replacement or Repair Mechanical	2M			130	469	599
350	5792947	Helms Liquid Rheostat A	M3 - Component Replacement or Repair Mechanical	2M	119	183	52	469	823

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351	5793576	Stanislaus Refurbish TWD 1	M3 - Component Replacement or Repair Mechanical	2M	712	237	1,992	51	2,993
352	5793583	Spaulding 1 Install Backup Gen (PSPS)	M2 - Component Replacement or Repair Electrical	2P		367	1,040	94	1,501
353	5793592	Spaulding 1 Rewind	M2 - Component Replacement or Repair Electrical	2M				750	750
354	5793595	Phoenix Install Flume Sheet Liner 2025	M1 - Component Replacement or Repair Civil	2N		734			734
355	5793603	Drum 1 Governor Oil Fire System	M3 - Component Replacement or Repair Mechanical	2L	143	92	468	9	712
356	5793609	Drum Canal Install Foot Bridge at 373+00	M1 - Component Replacement or Repair Civil	2L				131	131
357	5793610	Drum Canal Install Foot Bridge at 227+50	M1 - Component Replacement or Repair Civil	2L				131	131
358	5793613	Drum U1 Discharge Install Erosion Pro	M1 - Component Replacement or Repair Civil	2N			156	281	437
359	5796883	Cresta PH U2 Upgr Gen Protection Relays	M2 - Component Replacement or Repair Electrical	2M			62	234	297
360	5798031	Electra U2 Replace Bearings/RTDs	M3 - Component Replacement or Repair Mechanical	2M	1,626	161			1,786
361	5798259	Belden PH Repl WG Bushings and FPs	M3 - Component Replacement or Repair Mechanical	2M	314	325	395	382	1,415
362	5798384	Helms - Stabilize Xfmr Gallery Ceiling	M1 - Component Replacement or Repair Civil	2P	130	713	2,361	45	3,250
363	5798450	Salt Springs Tunnel 1 PSV trip cntl Rplc	M2 - Component Replacement or Repair Electrical	2M	428	1,101			1,529
364	5798499	Pit 3 Tailrace Bridge Refb Pier Voids	M1 - Component Replacement or Repair Civil	2P	7,191	92			7,282
365	5798518	Caribou 1 PH U2 Upgr Gen Protect Relays	M2 - Component Replacement or Repair Electrical	2M	3,089	367			3,456
366	5798519	Cresta PH U1 Upgr Gen Protection Relays	M2 - Component Replacement or Repair Electrical	2M	119	550	624		1,294
367	5800746	Pit 1 VH Recoat Penstocks	M1 - Component Replacement or Repair Civil	2N	593	24			617
368	5800747	Pit 1 PH Ctrl & AVR Rm Rebuild Non-Comb	M2 - Component Replacement or Repair Electrical	2L	36				36
369	5800778	Balch 2 – Arc Flash Mitigation of Overst	M2 - Component Replacement or Repair Electrical	2L	3,605	500			4,104
370	5801578	Helms HQ Woodchuck Generator Connection	M2 - Component Replacement or Repair Electrical	2P	71				71
371	5801960	JBB PH Install Smoke Detection	M4 - External Event Mitigation	2L		275	520		795
372	5801961	Pit 5 PH Install Smoke Detection	M4 - External Event Mitigation	2L		275	520		795
373	5801963	Pit 6 PH Install Smoke Detection	M4 - External Event Mitigation	2L		275	520		795
374	5801964	Pit 3 PH Install Smoke Detection	M4 - External Event Mitigation	2L		275	520		795
375	5801965	JBB PH Replace Gen CO2 Fire System	M3 - Component Replacement or Repair Mechanical	2L		367	1,664		2,031
376	5802604	Pit 6 Replace Low Voltage Switchgear	M2 - Component Replacement or Repair Electrical	2M			156	169	325
377	5802627	Stanislaus PH Install Smoke Detection	M4 - External Event Mitigation	2L		342	853	33	1,228
378	5802798	Helms Replace Generator CB 280	M2 - Component Replacement or Repair Electrical	2M	48				48
379	5802800	Helms U1 Replace CWS Demineralizer	M3 - Component Replacement or Repair Mechanical	2M		138	780		918
380	5802826	Drum U4 Refrb Turbine andThrust Bearing	M3 - Component Replacement or Repair Mechanical	2M	48	1,421			1,469
381	5802881	Caribou 2 PH Install Smoke Detection	M4 - External Event Mitigation	2L	49	689			737
382	5802882	Caribou 1 PH Install Smoke Detection	M4 - External Event Mitigation	2L	150	696			846
383	5802885	Rock Creek PH Repl GSU XFMR Bank 1ABC&SP	M2 - Component Replacement or Repair Electrical	2M	2,035	2,417	2,134	1,801	8,386
384	5802906	Kerckhoff 2 Crane Overhaul	M1 - Component Replacement or Repair Civil	2P	82				82
385	5803278	Pit 6 PH U1 Repl CT, PT, SA ,& Bus Duct	M2 - Component Replacement or Repair Electrical	2M	122	309	2,421	2,290	5,142

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386	5803279	Pit 6 PH U2 Repl CT, PT, SA ,& Bus Duct	M2 - Component Replacement or Repair Electrical	2M		117	351	2,181	2,649
387	5803280	Pit 7 PH U1 Replace CT, SA, & Bus Duct	M3 - Component Replacement or Repair Mechanical	2M	774	1,676			2,450
388	5803281	Pit 7 PH U2 Replace CT, SA, & Bus Duct	M3 - Component Replacement or Repair Mechanical	2M	492	945	1,789		3,225
389	5803658	Balch 2 U2/U3 Replace 5&12 Way Valve	M3 - Component Replacement or Repair Mechanical	2M			419	34	453
390	5804162	Helms PH Repl. T1 Hydr Pump & Motor	M3 - Component Replacement or Repair Mechanical	2N	1,665				1,665
391	5804200	Pit 5 Unit 3 Upgr Gen Relay GE SR489	M2 - Component Replacement or Repair Electrical	2M		24	345	37	407
392	5804201	Pit 5 Unit 4 Upgr Gen Relay GE SR489	M2 - Component Replacement or Repair Electrical	2M			30	342	372
393	5804202	JBB Unit 1 Upgrade Gen Relay GE SR489	M2 - Component Replacement or Repair Electrical	2M	29				29
394	5804209	Pit 4 PH U1 Inst Vibration Monitoring	M2 - Component Replacement or Repair Electrical	2M	276	878	145		1,300
395	5804210	Pit 4 PH U2 Inst Vibration Monitoring	M2 - Component Replacement or Repair Electrical	2M	276	878	145		1,300
396	5804211	Pit 3 PSV Control System Power Upgrade	M2 - Component Replacement or Repair Electrical	2N	71				71
397	5804258	Pit 4 PH Install Stop Log Gate Hoists	M3 - Component Replacement or Repair Mechanical	2L		873	2,104	144	3,121
398	5804261	Balch 1 Rplc 115kv Switching Structure	M2 - Component Replacement or Repair Electrical	2P	3,159	624			3,783
399	5804464	Main Tuolumne Cl-Install Shot Lin 2027	M1 - Component Replacement or Repair Civil	2N			832		832
400	5804465	Main Tuolumne Cl-Install Shot Lin 2028	M1 - Component Replacement or Repair Civil	2N				750	750
401	5805244	Pit 5 Tranxfmers Install Seismic Bracing	M1 - Component Replacement or Repair Civil	2L		1,347			1,347
402	5805725	Cresta PH Replace Tailrace	M1 - Component Replacement or Repair Civil	2P	57				57
403	5805941	Cresta PH U1 Upgrade Turbine	M3 - Component Replacement or Repair Mechanical	2M	476	1,647	1,867	3,550	7,539
404	5805958	Helms DWP and Sump Pump Imprv	M3 - Component Replacement or Repair Mechanical	2P	1,133				1,133
405	5805968	JBB to Iron Cyn Install Fiber Optic Com	M2 - Component Replacement or Repair Electrical	2M	1,806	92			1,897
406	5805973	Pit 3 PH Arc Flash Mitigation	M3 - Component Replacement or Repair Mechanical	2L	0	138	399	919	1,456
407	5806198	Helms U2 Instll Thrust Bracket LoadCells	M3 - Component Replacement or Repair Mechanical	2M	126	505			631
408	5806261	Tiger Creek Rplc Penstock Saddle blocks	M1 - Component Replacement or Repair Civil	2N	190	413			603
409	5806386	Cresta PH Repl GSU XFMR Bank 1 ABC & SP	M2 - Component Replacement or Repair Electrical	2M	1,356	1,455	3,262		6,074
410	5806452	Belden PH Inst Manual Sync Aux Relay	M2 - Component Replacement or Repair Electrical	2M		55	146		201
411	5806540	Helms U2 Refurb Wicket Gate Servo	M3 - Component Replacement or Repair Mechanical	2M	521	3,219	287		4,027
412	5806541	K2 Replace Cooling Water System	M3 - Component Replacement or Repair Mechanical	2M	190	183	208	2,999	3,581
413	5806542	Helms - Refurbish CB 270	M2 - Component Replacement or Repair Electrical	2M	48				48
414	5806543	Helms - Refurbish CB 290	M2 - Component Replacement or Repair Electrical	2M	48				48
415	5806544	Kings River PH - Inst PH Crane	M1 - Component Replacement or Repair Civil	2P				1,125	1,125
416	5806546	Helms Repl LRB Cooling Water Valve	M3 - Component Replacement or Repair Mechanical	2M		229	416	47	692
417	5806578	Kings River Pnstk Drainage Improvement	M1 - Component Replacement or Repair Civil	2M	476	459	52		986
418	5806580	K2 - Inst Station Svc Alternate Source	M2 - Component Replacement or Repair Electrical	2M			281	1,593	1,874
419	5806583	Haas Battery Room Install Fans	M3 - Component Replacement or Repair Mechanical	2P		229	260		489
420	5806586	Balch 1 Penstock Improvements	M1 - Component Replacement or Repair Civil	2M	951	46			997

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421	5806587	Balch 1 Repl 13.2 kV Med Volt Switchgear	M2 - Component Replacement or Repair Electrical	2M	1,940	711			2,651
422	5806588	Balch 2 PH Repl CWTR PIT Stop Gate	M3 - Component Replacement or Repair Mechanical	2M	816	92			907
423	5806589	Balch 2 U2 - Mitg LGB Oil Leak	M3 - Component Replacement or Repair Mechanical	2M	713	46			759
424	5806598	Haas VH Install Manual Transfer Switch	M2 - Component Replacement or Repair Electrical	2M		284	1,248	141	1,673
425	5806620	Helms PSP 230KV Cable Fire System Refurb	M3 - Component Replacement or Repair Mechanical	2M	143	1,147	2,080	70	3,440
426	5806818	Caribou 2 PH U4 Upgr Gen Protect Relays	M2 - Component Replacement or Repair Electrical	2M		296	335	1,880	2,512
427	5806839	Caribou 2 PH Rest Battery Room CMU Walls	M1 - Component Replacement or Repair Civil	2P	71				71
428	5807272	Salt Springs Rplc Cooling Water Piping	M3 - Component Replacement or Repair Mechanical	2M	333	734	52		1,119
429	5808138	Helms Upgr SER Phase II	M3 - Component Replacement or Repair Mechanical	2M	1,759	37			1,796
430	5808218	Helms - Repl Reverse Disconnects w/ Brkr	M2 - Component Replacement or Repair Electrical	2M	119	321	52		492
431	5808220	Balch 1 - PH Install Smoke Detection	M4 - External Event Mitigation	2L		229	312	1,537	2,078
432	5808221	Balch 2 - PH Install Smoke Detection	M4 - External Event Mitigation	2L		229	312	1,537	2,078
433	5808344	Rock Creek PH Repl GSU XFMR Banks 2ABC	M2 - Component Replacement or Repair Electrical	2M	2,157	1,927	4,421		8,504
434	5808618	Spaulding 2 Replace Wicket Gates	M3 - Component Replacement or Repair Mechanical	2M				469	469
435	5808622	Drum 2 Intake Gate Excess Flow	M2 - Component Replacement or Repair Electrical	2N	10				10
436	5808638	Helms U2 Station Service Bus Replacement	M3 - Component Replacement or Repair Mechanical	2M	71				71
437	5808709	Pit 4 PH Replace Heat Exchanger	M2 - Component Replacement or Repair Electrical	2M	190	275	52		518
438	5808858	Haas Replace 13.8kv Upper Disconnect SW	M2 - Component Replacement or Repair Electrical	2M	167				167
439	5808900	Helms U1 Governor Controls Upgrade	M2 - Component Replacement or Repair Electrical	2M	72				72
440	5808965	Rock Creek U1 Upgr Cool Wtr Stnr	M2 - Component Replacement or Repair Electrical	2M	285	92			377
441	5808966	Rock Creek U2 Upgr Cool Wtr Stnr	M2 - Component Replacement or Repair Electrical	2M	285	92			377
442	5809138	Helms U1 Gov Comp Lifecycle Rplc	M2 - Component Replacement or Repair Electrical	2M				47	47
443	5809139	Helms U2 Gov Comp Lifecycle Rplc	M3 - Component Replacement or Repair Mechanical	2M	1,541	1,697			3,238
444	5809140	Helms U3 Gov Comp Lifecycle Rplc	M3 - Component Replacement or Repair Mechanical	2M				234	234
445	5809239	Helms LRA PLC Replacement	M2 - Component Replacement or Repair Electrical	2M	95	229	52		377
446	5809258	Haas U1 Replace Turbine Bearing Cooling	M3 - Component Replacement or Repair Mechanical	2M	770				770
447	5809259	Haas U2 Replace Turbine Bearing Cooling	M3 - Component Replacement or Repair Mechanical	2M	792				792
448	5809538	Balch PH1 U1 Install Sync Check Relay	M2 - Component Replacement or Repair Electrical	2M	48				48
449	5809560	Pit 3 U1 Replace Gov Accumulator Tank	M3 - Component Replacement or Repair Mechanical	2M	333	69			402
450	5809561	Pit 3 U2 Replace Gov Accumulator Tank	M3 - Component Replacement or Repair Mechanical	2M	143	321	78		542
451	5809562	Pit 3 U3 Replace Gov Accumulator Tank	M3 - Component Replacement or Repair Mechanical	2M	143	321	78		542
452	5809563	Pit 1 U1 Replace Gov Accumulator Tank	M3 - Component Replacement or Repair Mechanical	2M	366	76			442
453	5809564	Pit 1 U2 Replace Gov Accumulator Tank	M3 - Component Replacement or Repair Mechanical	2M	366	76			442
454	5809565	Pit 5 U1 Replace Gov Accumulator Tank	M3 - Component Replacement or Repair Mechanical	2M	366	76			442
455	5809566	Pit 5 U2 Replace Gov Accumulator Tank	M3 - Component Replacement or Repair Mechanical	2M	366	76			442

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456	5809567	Pit 5 U3 Replace Gov Accumulator Tank	M3 - Component Replacement or Repair Mechanical	2M	366	76			442
457	5809568	Pit 5 U4 Replace Gov Accumulator Tank	M3 - Component Replacement or Repair Mechanical	2M	366	76			442
458	5809738	Helms Unit 1 Draft Tube Gate Install	M1 - Component Replacement or Repair Civil	2M	5,512	8,769	5,091	50	19,423
459	5809739	Helms Unit 2 Draft Tube Gate Install	M1 - Component Replacement or Repair Civil	2M		688	1,325	24,028	26,041
460	5809927	Electra PH Stabilize Substation Slope	M1 - Component Replacement or Repair Civil	2P		413			413
461	5809989	Electra Penstock Inst Erosion Protection	M2 - Component Replacement or Repair Electrical	2N	333				333
462	5810358	Helms U1-2-3 Replace kV Cables	M2 - Component Replacement or Repair Electrical	2M	119	229	1,560	2,343	4,251
463	5810362	Helms U2 Replace Excitation System	M2 - Component Replacement or Repair Electrical	2M		92	312	703	1,107
464	5810367	Balch 2 U2 Replace Exciter Controls	M2 - Component Replacement or Repair Electrical	2M	119	321	520	47	1,007
465	5810368	Balch 2 U3 Replace Exciter Controls	M2 - Component Replacement or Repair Electrical	2M	119	321	520	47	1,007
466	5810369	Haas U1 Replace Exciter Controls	M3 - Component Replacement or Repair Mechanical	2M	119	321	832	422	1,694
467	5810370	Haas U1 Inst Exciter Brushell Excitation	M2 - Component Replacement or Repair Electrical	2M	119	321	520	47	1,007
468	5810371	Haas U2 Inst Exciter BrushlessExcitation	M2 - Component Replacement or Repair Electrical	2M	119	321	520	47	1,007
469	5810372	Haas U2 Replace Exciter Controls	M3 - Component Replacement or Repair Mechanical	2M	119	321	832	47	1,319
470	5810373	Haas PH Inst AutoXfmr 21Kv to 12Kv Tie	M2 - Component Replacement or Repair Electrical	2M	119	321	520		960
471	5810376	K2 U1 Replace Exciter Controls	M2 - Component Replacement or Repair Electrical	2M	119	229	364	469	1,181
472	5810725	Tiger Crk Canal Rest Fdn & Erosion Prot	M1 - Component Replacement or Repair Civil	2N		229	780		1,010
473	5810738	Helms U3 Rewind Starting Motor	M3 - Component Replacement or Repair Mechanical	2M	5,132	12,935	6,491	5,623	30,182
474	5810818	Helms U1-U3 Rotor Brake Ring Improvement	M2 - Component Replacement or Repair Electrical	2M	143	138	520	469	1,269
475	5811968	Pit 5 Penstock Geotechnical Hardening	M1 - Component Replacement or Repair Civil	2L		138	3,121		3,258
476	5811971	JBB Whole Unit Replacement	M2 - Component Replacement or Repair Electrical	2M			1,040	937	1,977
477	5811972	Pit 6 Whole Unit Replacement	M2 - Component Replacement or Repair Electrical	2M				937	937
478	5811978	Pit 4 U1 PRV PLC Upgrade	M2 - Component Replacement or Repair Electrical	2M	571	1,055	52		1,678
479	5811979	Pit 4 U2 PRV PLC Upgrade	M2 - Component Replacement or Repair Electrical	2M	119	550	1,196	47	1,912
480	5812027	YB139 Install Backup Generator	M2 - Component Replacement or Repair Electrical	2N	143	229	26		398
481	5812030	Drum U1 & U2 Tailrace Install Liner	M1 - Component Replacement or Repair Civil	2N			156	281	437
482	5812064	Drum 1 Replace Penstock 1	M1 - Component Replacement or Repair Civil	2N				469	469
483	5812069	Drum Canal Replace Liner	M1 - Component Replacement or Repair Civil	2N				937	937
484	5812086	Spaulding 2 PH Repl Solid State Exciter	M2 - Component Replacement or Repair Electrical	2M				328	328
485	5812091	Tiger Creek Canal Install Liner 2030	M1 - Component Replacement or Repair Civil	2M				750	750
486	5812092	Tiger Creek Canal Install Liner 2029	M1 - Component Replacement or Repair Civil	2M			832		832
487	5812094	Stanislaus Rplc Cooling Water strainer#2	M2 - Component Replacement or Repair Electrical	2M	143	183			326
488	5812096	Stan Penstock Install two 12" drain valv	M3 - Component Replacement or Repair Mechanical	2M	190				190
489	5812100	Salt Springs U1 RTDs and Cooling System	M2 - Component Replacement or Repair Electrical	2M			1,248	1,406	2,654
490	5812104	Electra U2 Replace Gov Accumulator Tank	M3 - Component Replacement or Repair Mechanical	2M			104	187	291

Pacific Gas and Electric Company
2027 General Rate Case
Exhibit (PG&E-5), Chapter 3
Hydro Operations
Risk Register Mapping - Capital
(Thousands of Nominal Dollars)

Line No.	Planning Order	Planning Order Description	Mitigation or Control Name	MWC	2027 Forecast ($000)	2028 Forecast ($000)	2029 Forecast ($000)	2030 Forecast ($000)	2027-2030 Forecast ($000)
491	5812105	Electra U1 Replace Gov Accumulator Tank	M3 - Component Replacement or Repair Mechanical	2M		92	208		300
492	5812106	Salt Sprgs U1 Repl Gov Accumulator Tank	M3 - Component Replacement or Repair Mechanical	2M	95	183			279
493	5812107	Tiger Creek U1 Repl Gov Accumulator Tank	M3 - Component Replacement or Repair Mechanical	2M			104	281	385
494	5812108	Tiger Creek U2 Repl Gov Accumulator Tank	M3 - Component Replacement or Repair Mechanical	2M			104	187	291
495	5812159	Helms Install Spare 230kV Breaker	M2 - Component Replacement or Repair Electrical	2M		69	104	47	220
496	5812160	Helms - U1 Repl Station Service XFMR	M2 - Component Replacement or Repair Electrical	2M		138	156	328	622
497	5812161	Helms U1 Replace Excitation XFMR	M2 - Component Replacement or Repair Electrical	2M		115	364	1,406	1,884
498	5812162	Helms U1 Replace Bank 11 XFMR	M2 - Component Replacement or Repair Electrical	2M	119	321	1,456	47	1,943
499	5812163	Helms U2 Replace GSU Transformer	M2 - Component Replacement or Repair Electrical	2M			104	469	573
500	5812164	Helms U3 Repl Station Service XFMR	M2 - Component Replacement or Repair Electrical	2M	48	92	260	469	868
501	5812165	Helms U2 Replace Bank 12 XFMR	M2 - Component Replacement or Repair Electrical	2M		138	260	1,312	1,710
502	5812166	Helms U3 Replace Bank 13 XFMR	M2 - Component Replacement or Repair Electrical	2M		138	260	1,312	1,710
503	5812167	Helms Repl Ctrl Valve Seals (CV9 & CV10)	M3 - Component Replacement or Repair Mechanical	2M		115	520	70	705
504	5812168	Helms U2 Repl Station Service XFMR	M2 - Component Replacement or Repair Electrical	2M	48	92	260	469	868
505	5812169	Helms T1 Refurb T1GH Wheelgate	M2 - Component Replacement or Repair Electrical	2M	48				48
506	5812170	Helms U3 Runner Band Drain Valve	M3 - Component Replacement or Repair Mechanical	2M			130	797	927
507	5812171	Helms U2 Ref Thrust & Guide Bear	M3 - Component Replacement or Repair Mechanical	2M			156	422	578
508	5812172	Helms U3 Refurb Thrust & Guide Bear	M3 - Component Replacement or Repair Mechanical	2M				141	141
509	5812173	Helms U1 Replace Exciter	M3 - Component Replacement or Repair Mechanical	2M	143	229	364	703	1,439
510	5812174	Helms U2 Replace Exciter	M3 - Component Replacement or Repair Mechanical	2M		138	260	328	726
511	5812175	Helms U3 Replace Exciter	M3 - Component Replacement or Repair Mechanical	2M			156	234	390
512	5812176	Helms U2 Rewind Starting Motor	M3 - Component Replacement or Repair Mechanical	2M			156	469	625
513	5812177	Helms U1 Install Gen Breaker	M2 - Component Replacement or Repair Electrical	2M	48	92	260	937	1,337
514	5812178	Helms U2 Install Gen Breaker	M2 - Component Replacement or Repair Electrical	2M	143	229	1,040	984	2,396
515	5812179	Helms U3 Install Gen Breaker	M2 - Component Replacement or Repair Electrical	2M		138	260	937	1,335
516	5812180	Kings River PH Generator Rewind	M2 - Component Replacement or Repair Electrical	2M				117	117
517	5812186	K2 Replace the AC and DC HPL pumps	M3 - Component Replacement or Repair Mechanical	2M	476	46			522
518	5812187	K2 Repl Main Bank	M2 - Component Replacement or Repair Electrical	2M	119	459	520	70	1,168
519	5812188	Kings River Whole Unit Replacement	M2 - Component Replacement or Repair Electrical	2M		917	1,040	33,323	35,280
520	5812189	Balch 2 PH TWD SEG Installation	M3 - Component Replacement or Repair Mechanical	2M	713	46			759
521	5812242	SCADA 2027 RTU Life Cycle Replacement	M2 - Component Replacement or Repair Electrical	2M	6,163				6,163
522	5812243	SCADA 2028 RTU Life Cycle Replacement	M2 - Component Replacement or Repair Electrical	2M		5,255			5,255
523	5812244	SCADA 2029 RTU Life Cycle Replacement	M2 - Component Replacement or Repair Electrical	2M			6,366		6,366
524	5812245	SCADA 2030 RTU Life Cycle Replacement	M2 - Component Replacement or Repair Electrical	2M				5,623	5,623
525	5812249	Belden Intk & Pnstk Upgr Gate Ex Flow Pr	M2 - Component Replacement or Repair Electrical	2N	285	459			744

Pacific Gas and Electric Company
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Hydro Operations
Risk Register Mapping - Capital
(Thousands of Nominal Dollars)

Line No.	Planning Order	Planning Order Description	Mitigation or Control Name	MWC	2027 Forecast ($000)	2028 Forecast ($000)	2029 Forecast ($000)	2030 Forecast ($000)	2027-2030 Forecast ($000)
526	5812250	Belden Penstock 2023 Improvements	M3 - Component Replacement or Repair Mechanical	2N		92	260	562	914
527	5812251	Belden PH Upgr Heat Exchange OSPP Sys	M2 - Component Replacement or Repair Electrical	2M		92	260	281	633
528	5812252	Belden Siphon Repl Joint No. 4 Gasket	M1 - Component Replacement or Repair Civil	2N	95	138	1,812	71	2,116
529	5812253	Bucks Creek PH Replace GSU XFMR Bank 1	M2 - Component Replacement or Repair Electrical	2M		183	1,040	1,874	3,098
530	5812261	Butt Valley Inst Manual Sync Check Relay	M2 - Component Replacement or Repair Electrical	2M		55	146		201
531	5812267	BV Pnstk 2023 Coating & Improvements	M3 - Component Replacement or Repair Mechanical	2P		92	260	562	914
532	5812288	Caribou 1 PH Recoat Penstocks	M1 - Component Replacement or Repair Civil	2P	76	92	416		584
533	5812295	Caribou 2 Crane Upgrade/Replacement	M2 - Component Replacement or Repair Electrical	2P	190	275	936	1,406	2,807
534	5812296	Caribou 2 Penstock Geotech Hardening	M1 - Component Replacement or Repair Civil	2P				469	469
535	5812297	Caribou 2 Pnstk Upgr Excess Flow System	M2 - Component Replacement or Repair Electrical	2P	190	459			649
536	5812318	Caribou 2 PH Upgrade Roof	M1 - Component Replacement or Repair Civil	2P	71	138	312	937	1,458
537	5812321	Cresta PH Replace MV CB 52-24	M2 - Component Replacement or Repair Electrical	2M				94	94
538	5812322	Cresta Tunnel 2023 Improvements	M1 - Component Replacement or Repair Civil	2M	95	229	624		949
539	5812330	Poe PH Replace Station Service Bank 2	M2 - Component Replacement or Repair Electrical	2M	48	159	239	647	1,092
540	5812333	Rock Creek PH Improv Pnstk Pedestals	M2 - Component Replacement or Repair Electrical	2M	143	183	520	94	940
541	5812334	Rock Creek PH Install Gen CO2 Fire Syste	M3 - Component Replacement or Repair Mechanical	2L	114	356	1,649		2,119
542									
543									
544			**GSHUT Total**		**233,913**	**200,736**	**177,583**	**229,767**	**841,998**
545									
546			**Grand Total**		**397,198**	**472,051**	**427,853**	**437,490**	**1,734,592**

Pacific Gas and Electric Company
2027 General Rate Case
Exhibit (PG&E-05) Chapter 3
Year-Over-Year Recorded Capital Variance Summary in Dollars
(Thousands of Nominal Dollars)

Line No.	Exhibit	Chapter	MWC	MWC Description	2020 Recorded	2021 Recorded	Variance	Variance Required Y/N	Variance Explanation	Percentage Change
1	**5**	**3**	05	Tools & Equipment	**1,898**	**1,991**	93	No	NA	5%
2	**5**	**3**	11	Relicensing Hydro Gen	**567**	**524**	(43)	Yes	Annual Capital Projects started and completed	-8%
3	**5**	**3**	12	Implement Environment Projects	**84**	**24**	(59)	Yes	Annual Capital Projects started and completed	-71%
4	**5**	**3**	2L	Instl/Rpl for Hydro Safety&Reg	**29,592**	**27,219**	(2,373)	No	NA	-8%
5	**5**	**3**	2M	Instal/Repl Hydro Gneratng Eqp	**94,880**	**114,434**	19,554	Yes	Bucks Cr PH Repl U2 Turb Brg / Shaft	21%
6	**5**	**3**	2N	Instal/Repl Resv, Dams&Waterway	**45,193**	**27,576**	(17,617)	Yes	Tiger Cr Cnl-Install Flume Lnr 2019/2020	-39%
7	**5**	**3**	2P	Instl/Repl Hydr BldgGrndInfrst	**8,015**	**19,557**	11,541	Yes	Pit 3 PH Replace Crane(s) Controls	144%
8	**5**	**3**	3H	Hydroelec Lic & Lic Conditions	**17,708**	**16,696**	(1,013)	No	NA	-6%

Pacific Gas and Electric Company
2027 General Rate Case
Exhibit (PG&E-05) Chapter 3
Year-Over-Year Recorded Capital Variance Summary in Dollars
(Thousands of Nominal Dollars)

Line No.	Exhibit	Chapter	MWC	MWC Description	2021 Recorded	2022 Recorded	Variance	Variance Required Y/N	Variance Explanation	Percentage Change
1	**5**	**3**	05	Tools & Equipment	**1,991**	**1,494**	(497)	Yes	Annual Capital Projects started and completed	-25%
2	**5**	**3**	11	Relicensing Hydro Gen	**524**	**633**	109	Yes	Annual Capital Projects started and completed	21%
3	**5**	**3**	12	Implement Environment Projects	**24**	**26**	2	Yes	Annual Capital Projects started and completed	9%
4	**5**	**3**	2L	Instl/Rpl for Hydro Safety&Reg	**27,219**	**27,606**	387	No	NA	1%
5	**5**	**3**	2M	Instal/Repl Hydro Gneratng Eqp	**114,434**	**114,150**	(284)	No	NA	0%
6	**5**	**3**	2N	Instal/Repl Resv,Dams&Waterway	**27,576**	**38,066**	10,490	Yes	Lake Almanor LLO Tunnel Repl Liner DOE	38%
7	**5**	**3**	2P	Instl/Repl Hydr BldgGrndInfrst	**19,557**	**19,272**	(285)	No	NA	-1%
8	**5**	**3**	3H	Hydroelec Lic & Lic Conditions	**16,696**	**18,648**	1,952	Yes	McCloud Refb Hawkins Cr Rd Upr Slid SAIP	12%

Pacific Gas and Electric Company
2027 General Rate Case
Exhibit (PG&E-05) Chapter 3
Year-Over-Year Recorded Capital Variance Summary in Dollars
(Thousands of Nominal Dollars)

Line No.	Exhibit	Chapter	MWC	MWC Description	2022 Recorded	2023 Recorded	Variance	Variance Required Y/N	Variance Explanation	Percentage Change
1	**5**	**3**	05	Tools & Equipment	**1,494**	**7,184**	5,690	Yes	PE: Purchase Capital Tools	381%
2	**5**	**3**	11	Relicensing Hydro Gen	**633**	**918**	285	Yes	Annual Capital Projects started and completed	45%
3	**5**	**3**	12	Implement Environment Projects	**26**	**34**	7	Yes	Annual Capital Projects started and completed	28%
4	**5**	**3**	2L	Instl/Rpl for Hydro Safety&Reg	**27,606**	**25,396**	(2,210)	No	NA	-8%
5	**5**	**3**	2M	Instal/Repl Hydro Gneratng Eqp	**114,150**	**115,908**	1,758	No	NA	2%
6	**5**	**3**	2N	Instal/Repl Resv,Dams&Waterway	**38,066**	**46,960**	8,895	Yes	Tiger Crk ABay Erosion Protection DOE	23%
7	**5**	**3**	2P	Instl/Repl Hydr BldgGrndInfrst	**19,272**	**41,827**	22,555	Yes	Helms McKinley Grove Road Imprv	117%
8	**5**	**3**	3H	Hydroelec Lic & Lic Conditions	**18,648**	**35,347**	16,699	Yes	McCloud Spillway Improvements SAIP	90%

Pacific Gas and Electric Company
2027 General Rate Case
Exhibit (PG&E-05) Chapter 3
Year-Over-Year Recorded Capital Variance Summary in Dollars
(Thousands of Nominal Dollars)

Line No.	Exhibit	Chapter	MWC	MWC Description	2023 Recorded	2024 Recorded	Variance	Variance Required Y/N	Variance Explanation	Percentage Change
1	**5**	**3**	05	Tools & Equipment	**7,184**	**4,338**	(2,846)	Yes	PE: Purchase Capital Tools	-40%
2	**5**	**3**	11	Relicensing Hydro Gen	**918**	**1,122**	204	Yes	Annual Capital Projects started and completed	22%
3	**5**	**3**	12	Implement Environment Projects	**34**	**200**	166	Yes	Annual Capital Projects started and completed	490%
4	**5**	**3**	2L	Instl/Rpl for Hydro Safety&Reg	**25,396**	**70,347**	44,951	Yes	Fordyce Dam Leakage Reduction DOE	177%
5	**5**	**3**	2M	Instal/Repl Hydro Gneratng Eqp	**115,908**	**196,209**	80,301	Yes	Spaulding 1 PRV Discharge Liner Rplc	69%
6	**5**	**3**	2N	Instal/Repl Resv,Dams&Waterway	**46,960**	**102,324**	55,364	Yes	Courtright Dam Upgrade I/D Gate Control	118%
7	**5**	**3**	2P	Instl/Repl Hydr BldgGrndInfrst	**41,827**	**37,023**	(4,804)	Yes	Helms McKinley Grove Road Imprv	-11%
8	**5**	**3**	3H	Hydroelec Lic & Lic Conditions	**35,347**	**40,795**	5,449	Yes	Lower Bucks Spillway RestorationSAIP DOE	15%

Pacific Gas and Electric Company
2027 General Rate Case
Exhibit (PG&E-5), Chapter 3
Hydro Operations
Hydroelectric Powerhouse Data as of December 31, 2024

Line No.	Area	Water-shed	Powerhouse	FERC License No.	No. of Units	RPS Eligible	Normal Max. Gross Head (Ft)	Flow (1) (CFS)	Normal Operating Capacity (2) (MW)	Year of Operation	Comments
1	**Shasta**										
2		**McCLOUD PIT**									
3			Hat Creek #1	2661	1	Yes	213.0	545.0	8.5	1921	
4			Hat Creek #2	2661	1	Yes	198.0	580.0	8.5	1921	
5			Pit #1	2687	2	No	455.0	1,900.0	61.0	1922	
6			Pit #3	233	3	No	315.0	3,300.0	70.0	1925	
7			Pit #4	233	2	No	382.0	3,816.0	95.0	1955	
8			Pit #5	233	4	No	615.0	3,900.0	160.0	1944	
9			James B. Black	2106	2	No	1,226.0	2,000.0	172.0	1965	
10			Pit #6	2106	2	No	155.0	6,470.0	80.0	1965	
11			Pit #7	2106	2	No	205.0	7,440.0	112.0	1965	
12		**COW-BATTLE CREEK**									
13			Volta #1	1121	1	Yes	1,264.0	115.0	9.0	1980	
14			Volta #2	1121	1	Yes	125.0	115.0	0.9	1981	
15			South	1121	1	Yes	516.0	190.0	7.0	1979	
16			Inskip	1121	1	Yes	383.0	270.0	8.0	1979	
17			Coleman	1121	1	Yes	482.0	340.0	13.0	1979	
18			Kilarc	606	0	Yes	NA	NA	0.0	1903	Retired 10/17/2024
19			Cow Creek	606	0	Yes	NA	NA	0.0	1907	Retired 10/17/2024
20	Total Shasta				24				804.9		
21											
22	**DeSabla**										
23		**DE SABLA SYSTEM**									
24			Toadtown	803	1	Yes	185.0	134.0	1.5	1986	
25			De Sabla	803	1	Yes	1,530.0	171.0	18.5	1963	
26			Centerville	803	2	Yes	590.0	183.0	6.4	1900	
27			Lime Saddle	--	0	Yes	NA	NA	0.0	1906	Retired 12/31/2023
28		**FEATHER**									
29			Hamilton Branch	--	2	Yes	410.0	200.0	4.8	1921	
30			Butt Valley	2105	1	No	362.0	2,118.0	41.0	1958	
31			Caribou #1	2105	3	No	1,151.0	1,114.0	75.0	1921	
32			Caribou #2	2105	2	No	1,150.0	1,464.0	120.0	1958	
33			Oak Flat	2105	1	Yes	137.0	140.0	1.3	1985	
34			Belden	2105	1	No	770.0	2,410.0	125.0	1969	
35			Rock Creek	1962	2	No	535.0	2,880.0	112.0	1950	
36			Rock Creek Upgrade*			Yes			14.0	2013	
37			Bucks Creek	619	2	No	2,558.0	384.0	65.0	1928	

Pacific Gas and Electric Company
2027 General Rate Case
Exhibit (PG&E-5), Chapter 3
Hydro Operations
Hydroelectric Powerhouse Data as of December 31, 2024

Line No.	Area	Water-shed	Powerhouse	FERC License No.	No. of Units	RPS Eligible	Normal Max. Gross Head (Ft)	Flow (1) (CFS)	Normal Operating Capacity (2) (MW)	Year of Operation	Comments
38			Cresta	1962	2	No	290.0	3,510.0	70.0	1949	
39			Poe	2107	2	No	488.0	3,700.0	120.0	1958	
40		**EEL**									
41			Potter Valley	77	3	Yes	478.0	331.0	9.2	1908	
42	Total DeSabla				25				783.7		
43		*	Rock Creek was upgraded for an additional 14 MW (7 MW per unit). This additional capacity is RPS eligible.								
44											
45	**Drum**										
46		**SOUTH YUBA**									
47			Spaulding #3	2310	1	Yes	318.0	270.0	5.8	1929	
48			Spaulding #2	2310	1	Yes	344.0	200.0	4.4	1928	
49			Deer Creek	2310	0	Yes	NA	NA	0.0	1908	Sold 11/9/23
50			Spaulding #1	2310	1	Yes	197.0	550.0	7.0	1928	
51			Drum #1	2310	4	No	1,373.0	643.0	54.0	1913	
52			Drum #2	2310	1	No	1,370.0	505.0	49.5	1965	
53			Alta	2310	1	Yes	648.0	28.0	1.0	1902	Alta U2 retired in 2011
54			Dutch Flat #1	2310	1	Yes	643.0	490.0	22.0	1943	
55			Halsey	2310	1	Yes	327.0	495.0	11.0	1916	
56			Wise	2310	1	Yes	519.0	393.0	14.0	1917	
57			Wise #2	2310	1	Yes	519.0	80.0	3.2	1986	
58			Newcastle	2310	1	Yes	415.0	392.0	11.5	1986	
59		**AMERICAN**									
60			Chili Bar	2155	0	Yes	NA	NA	0.0	1965	Sold 11/20/2020
61	Total Drum				14.0				183.4		
62											
63	**Motherlode**										
64		**MOKELUMNE**									
65			Salt Springs	137	2	No	2,370.0	818.0	44.0	1931	
66			Tiger Creek	137	2	No	1,219.0	750.0	58.0	1931	
67			West Point	137	1	Yes	312.0	675.0	14.5	1948	
68			Electra	137	3	No	1,272.0	1,130.0	98.0	1948	
69		**STANISLAUS**									
70			Spring Gap	2130	1	Yes	1,865.0	59.0	7.0	1921	
71			Stanislaus	2130	1	No	1,525.0	830.0	91.0	1963	
72			Phoenix	1061	1	Yes	1,187.0	25.0	2.0	1940	
73	Total Motherlode				11.0				314.5		
74											

Pacific Gas and Electric Company
2027 General Rate Case
Exhibit (PG&E-5), Chapter 3
Hydro Operations
Hydroelectric Powerhouse Data as of December 31, 2024

Line No.	Area	Water-shed	Powerhouse	FERC License No.	No. of Units	RPS Eligible	Normal Max. Gross Head (Ft)	Flow (1) (CFS)	Normal Operating Capacity (2) (MW)	Year of Operation	Comments
75	**Kings-Crane**										
76		**SAN JOAQUIN**									
77			Crane Valley	1354	1	Yes	128.0	160.0	0.9	1919	
78			San Joaquin #3	1354	1	Yes	405.0	164.0	4.2	1923	
79			San Joaquin #2	1354	1	Yes	307.0	148.0	3.2	1917	
80			San Joaquin #1-A	1354	1	Yes	42.0	167.0	0.4	1919	
81			Wishon	1354	4	Yes	1,412.0	235.0	20.0	1910	
82			Kerckhoff	96	2	Yes	350.0	1,156.7	25.4	1920	
83			Kerckhoff #2	96	1	No	421.0	5,100.0	155.0	1983	
84		**KINGS**									
85			Haas	1988	2	No	2,444.0	825.0	144.0	1958	
86			Kings River	1988	1	No	798.0	990.0	52.0	1962	
87			Balch #1	175	1	No	2,379.0	213.0	31.0	1927	
88			Balch #2	175	2	No	2,389.0	630.0	105.0	1958	
89		**TULE**									
90			Tule River	1333	0	Yes	NA	NA	0.0	1914	Sold 5/26/23
91	Total Kings-Crane				17				541.1		
92											
93	**Helms**										
94			Helms	2735	3	No	1,744.0	9,000.0	1,212.0	1984	
95	Total Helms				3				1,212.0		
96											
97	**PG&E TOTAL**				**94.0**				**3,839.6**		
98											
99		Notes									
100		1)	Flow @ Normal Operating Capacity @ Normal Maximum Gross Head								
101		2)	Based on best available 30-YR historical data								

Pacific Gas and Electric Company
2027 General Rate Case
Exhibit (PG&E-5), Chapter 3
Power Generation (PG)
Headcount Forecast

Line No.		Power Generation Continuous Improvement	Fossil Operations & Maintenance	Power Generation Planning & Asset Management	Hydro Operations & Maintenance	Project Execution	Power Generation VP Immediate Office	Total Headcount
1	**2024 Actual Headcount (as of December 31, 2024)**	16	77	149	387	353	4	**986**
2	**2027 Proposed Organization Forecast Headcount**	**24**	**77**	**170**	**517**	**479**	**4**	**1,271**

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Hydro Operations
Forecast Headcount Growth and Cost

Line No.	Sub-Organization	MWC	Hiring Date Assumption	Position Name	FTEs	Salary per FTE	Total Salary Cost	Expense Planning Order Impacted	Expense Planning Order Description	Testimony Cost Driver Category	Expense Cost	Capital Planning Order Impacted	Capital Planning Order Description	Capital Credit to Expense	Net Expense Impact	Net Capital Impact
1	Asset Excellence	Various	1/1/2025	ESC Journey Engineers	13	$ 157,000	$2,041,000	Various	Forecast to support capital 100%		$ -	Various	Forecast to support capital 100%	$ -	$ -	$ 2,041,000
2	Hydro O&M North	KH	1/1/2025	O&M Specialist, Principal	1	$ 180,000	$ 180,000	5000557	Shasta Maint Generators	Base Maintenance Improvements	$ 180,000	N/A	N/A - Will not support capital work	$ -	$ 180,000	$ -
3	Hydro O&M South	KH	1/1/2025	O&M Specialist, Principal	1	$ 180,000	$ 180,000	5000559	Drum Maint Generators	Base Maintenance Improvements	$ 180,000	N/A	N/A - Will not support capital work	$ -	$ 180,000	$ -
4	Hydro O&M North	KH	1/1/2025	Work & Resource Coordinator, Expert	1.5	$ 146,000	$ 219,000	5000557	Shasta Maint Generators	Base Maintenance Improvements	$ 219,000	N/A	N/A - Will not support capital work	$ -	$ 219,000	$ -
5	Hydro O&M North	KH	1/1/2025	Work & Resource Coordinator, Expert	1.5	$ 146,000	$ 219,000	5000558	DeSabla Maint Generators	Base Maintenance Improvements	$ 219,000	N/A	N/A - Will not support capital work	$ -	$ 219,000	$ -
6	Hydro O&M South	KH	1/1/2025	Work & Resource Coordinator, Expert	1.5	$ 146,000	$ 219,000	5000559	Drum Maint Generators	Base Maintenance Improvements	$ 219,000	N/A	N/A - Will not support capital work	$ -	$ 219,000	$ -
7	Hydro O&M South	KH	1/1/2025	Work & Resource Coordinator, Expert	1.5	$ 146,000	$ 219,000	5000560	MLode Maint Generators	Base Maintenance Improvements	$ 219,000	N/A	N/A - Will not support capital work	$ -	$ 219,000	$ -
8	Hydro O&M South	KH	1/1/2025	Work & Resource Coordinator, Expert	1.5	$ 146,000	$ 219,000	5000561	KCV Maint Generators	Base Maintenance Improvements	$ 219,000	N/A	N/A - Will not support capital work	$ -	$ 219,000	$ -
9	Hydro O&M South	KH	1/1/2025	Work & Resource Coordinator, Expert	1.5	$ 146,000	$ 219,000	5000562	Helms Maint Generators	Base Maintenance Improvements	$ 219,000	N/A	N/A - Will not support capital work	$ -	$ 219,000	$ -
10	Hydro O&M North	AX	1/1/2027	Water System Repairperson	3	$ 163,488	$ 490,464	5000528	Shasta Maint Reservoirs/Dams/Waterways	Base Water Delivery & Storage Maintenance Improvem	$ 490,464	Various	Supports specific capital work as it	$ (147,139)	$ 343,325	$ 147,139
11	Hydro O&M North	AX	1/1/2027	Water System Repairperson - Camp Or	3	$ 163,488	$ 490,464	5015289	Camp One Maint Reservoirs/Dams/Waterways	Base Water Delivery & Storage Maintenance Improvem	$ 490,464	Various	Supports specific capital work as it	$ (147,139)	$ 343,325	$ 147,139
12	Hydro O&M North	AX	1/1/2027	Water System Repairperson - DeSabla	3	$ 163,488	$ 490,464	5000529	DeSabla Maint Reserv, Dams & Waterways	Base Water Delivery & Storage Maintenance Improvem	$ 490,464	Various	Supports specific capital work as it	$ (147,139)	$ 343,325	$ 147,139
13	Hydro O&M South	AX	1/1/2027	Water System Repairperson	1	$ 163,488	$ 163,488	5000530	Drum Maint Reservoirs/Dam/Waterways	Base Water Delivery & Storage Maintenance Improvem	$ 163,488	Various	Supports specific capital work as it	$ (49,046)	$ 114,442	$ 49,046
14	Hydro O&M South	AX	1/1/2027	Water System Repairperson	1	$ 163,488	$ 163,488	5000531	MLode Maint Reservoirs/Dams/Waterways	Base Water Delivery & Storage Maintenance Improvem	$ 163,488	Various	Supports specific capital work as it	$ (49,046)	$ 114,442	$ 49,046
15	Hydro O&M South	AX	1/1/2027	Water System Repairperson	1	$ 163,488	$ 163,488	5000532	KCV Maint Reservoirs/Dams/Waterways	Base Water Delivery & Storage Maintenance Improvem	$ 163,488	Various	Supports specific capital work as it	$ (49,046)	$ 114,442	$ 49,046
16	Hydro O&M South	AX	1/1/2027	Water System Repairperson	1	$ 163,488	$ 163,488	5000533	Helms Maint Reservoirs/Dams/Waterways	Base Water Delivery & Storage Maintenance Improvem	$ 163,488	Various	Supports specific capital work as it	$ (49,046)	$ 114,442	$ 49,046
17	Hydro O&M North	KG	1/1/2027	Operator	10	$ 163,488	$1,634,880	5000512	Shasta Operate Generation Facilities	Hydro Operators	$ 1,634,880	N/A	N/A - Will not support capital work	$ -	$1,634,880	$ -
18	Hydro O&M North	KG	1/1/2027	Hydro Utility Operator (HUO)	1	$ 163,488	$ 163,488	5000512	Shasta Operate Generation Facilities	Hydro Operators	$ 163,488	N/A	N/A - Will not support capital work	$ -	$ 163,488	$ -
19	Hydro O&M North	KG	1/1/2027	Operator	10	$ 163,488	$1,634,880	5000513	DeSabla Operate Generation Facilities	Hydro Operators	$ 1,634,880	N/A	N/A - Will not support capital work	$ -	$1,634,880	$ -
20	Hydro O&M North	KG	1/1/2027	Hydro Utility Operator (HUO)	2	$ 163,488	$ 326,976	5000513	DeSabla Operate Generation Facilities	Hydro Operators	$ 326,976	N/A	N/A - Will not support capital work	$ -	$ 326,976	$ -
21	Hydro O&M South	KG	1/1/2027	Operator	9	$ 163,488	$1,471,392	5000514	Drum Operate Generation Facilities	Hydro Operators	$ 1,471,392	N/A	N/A - Will not support capital work	$ -	$1,471,392	$ -
22	Hydro O&M South	KG	1/1/2027	Operator	6	$ 163,488	$ 980,928	5000515	MLode Operate Generation Facilities	Hydro Operators	$ 980,928	N/A	N/A - Will not support capital work	$ -	$ 980,928	$ -
23	Hydro O&M South	KG	1/1/2027	Operator	6	$ 163,488	$ 980,928	5000516	KCV Operate Generation Facilities	Hydro Operators	$ 980,928	N/A	N/A - Will not support capital work	$ -	$ 980,928	$ -
24	Hydro O&M South	KG	1/1/2027	Hydro Utility Operator (HUO)	1	$ 163,488	$ 163,488	5000516	KCV Operate Generation Facilities	Hydro Operators	$ 163,488	N/A	N/A - Will not support capital work	$ -	$ 163,488	$ -
25	Hydro O&M South	KG	1/1/2027	Operator	3	$ 163,488	$ 490,464	5000517	Helms Operate Generation Facilities	Hydro Operators	$ 490,464	N/A	N/A - Will not support capital work	$ -	$ 490,464	$ -
26	Hydro O&M South	KG	1/1/2027	Supervisor	1	$ 184,000	$ 184,000	5057916	PCC 14211 - Hydro Water Mgmt. Allocation	Hydro Operators	$ 184,000	N/A	N/A - Will not support capital work	$ -	$ 184,000	$ -
27	Hydro O&M North	KH	1/1/2027	Electrical Machinist	1	$ 163,488	$ 163,488	5000557	Shasta Maint Generators	Base Maintenance Improvements	$ 163,488	Various	Supports specific capital work as it	$ (9,809)	$ 153,679	$ 9,809
28	Hydro O&M North	KH	1/1/2027	Communications Technician	2	$ 163,488	$ 326,976	5000449	Shasta Maint TCom/Comput/Network	Base Maintenance Improvements	$ 326,976	Various	Supports specific capital work as it	$ (19,619)	$ 307,357	$ 19,619

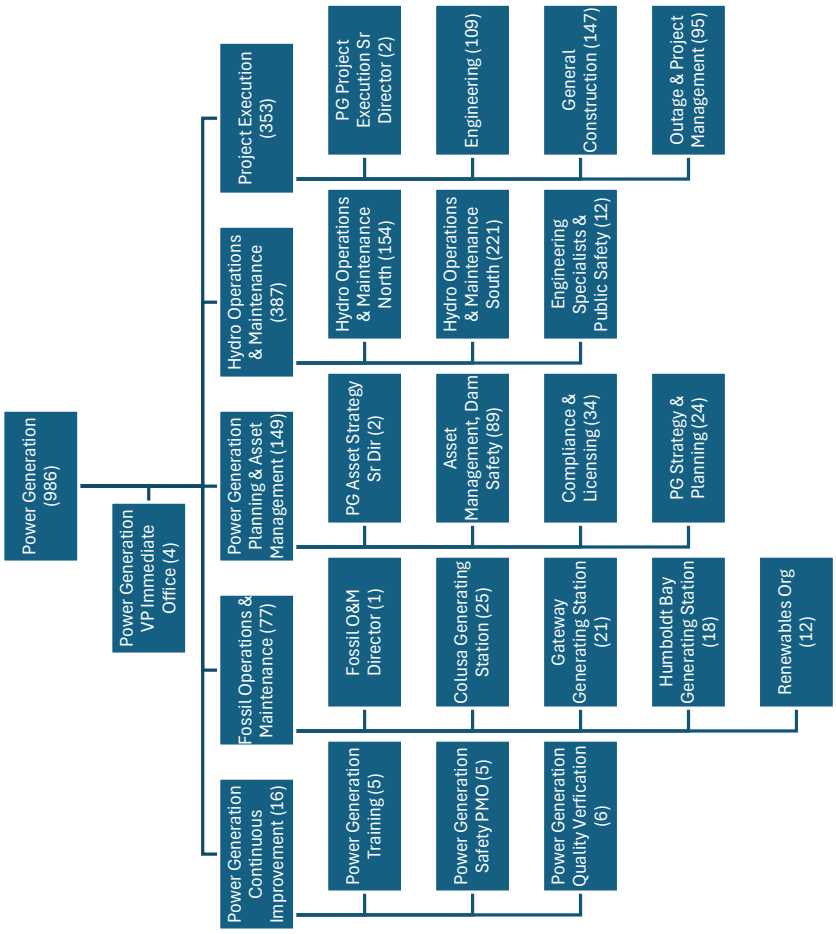
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2027 General Rate Case
Exhibit (PG&E-5), Chapter 3
Hydro Operations
Forecast Headcount Growth and Cost

Line No.	Sub-Organization	MWC	Hiring Date Assumption	Position Name	FTEs	Salary per FTE	Total Salary Cost	Expense Planning Order Impacted	Expense Planning Order Description	Testimony Cost Driver Category	Expense Cost	Capital Planning Order Impacted	Capital Planning Order Description	Capital Credit to Expense	Net Expense Impact	Net Capital Impact
29	Hydro O&M North	KH	1/1/2027	Instrument and Control Technician	4	$ 163,488	$ 653,952	5000557	Shasta Maint Generators	Base Maintenance Improvements	$ 653,952	Various	Supports specific capital work as it	$ (261,581)	$ 392,371	$ 261,581
30	Hydro O&M North	KH	1/1/2027	Hydro Maintenance Supervisor	1	$ 184,000	$ 184,000	5000557	Shasta Maint Generators	Base Maintenance Improvements	$ 184,000	N/A	N/A - Will not support capital work	$ -	$ 184,000	$ -
31	Hydro O&M North	KH	1/1/2027	Electrical Machinist	1	$ 163,488	$ 163,488	5000558	DeSabla Maint Generators	Base Maintenance Improvements	$ 163,488	Various	Supports specific capital work as it	$ (9,809)	$ 153,679	$ 9,809
32	Hydro O&M North	KH	1/1/2027	Electrician	1	$ 163,488	$ 163,488	5000558	DeSabla Maint Generators	Base Maintenance Improvements	$ 163,488	Various	Supports specific capital work as it	$ (9,809)	$ 153,679	$ 9,809
33	Hydro O&M North	KH	1/1/2027	Instrument and Control Technician	4	$ 163,488	$ 653,952	5000558	DeSabla Maint Generators	Base Maintenance Improvements	$ 653,952	Various	Supports specific capital work as it	$ (261,581)	$ 392,371	$ 261,581
34	Hydro O&M North	KH	1/1/2027	Inspection Supervisor	1	$ 184,000	$ 184,000	5000558	DeSabla Maint Generators	Base Maintenance Improvements	$ 184,000	N/A	N/A - Will not support capital work	$ -	$ 184,000	$ -
35	Hydro O&M North	KH	1/1/2027	Hydro Maintenance Supervisor	1	$ 184,000	$ 184,000	5000558	DeSabla Maint Generators	Base Maintenance Improvements	$ 184,000	N/A	N/A - Will not support capital work	$ -	$ 184,000	$ -
36	Hydro O&M South	KH	1/1/2027	Electrical Technician	1	$ 163,488	$ 163,488	5000559	Drum Maint Generators	Base Maintenance Improvements	$ 163,488	Various	Supports specific capital work as it	$ (9,809)	$ 153,679	$ 9,809
37	Hydro O&M South	KH	1/1/2027	Electrician	1	$ 163,488	$ 163,488	5000559	Drum Maint Generators	Base Maintenance Improvements	$ 163,488	Various	Supports specific capital work as it	$ (9,809)	$ 153,679	$ 9,809
38	Hydro O&M South	KH	1/1/2027	Communications Technician	1	$ 163,488	$ 163,488	5000451	Drum Maint TCom/Computer Network	Base Maintenance Improvements	$ 163,488	Various	Supports specific capital work as it	$ (9,809)	$ 153,679	$ 9,809
39	Hydro O&M South	KH	1/1/2027	Instrument and Control Technician	4	$ 163,488	$ 653,952	5000559	Drum Maint Generators	Base Maintenance Improvements	$ 653,952	Various	Supports specific capital work as it	$ (261,581)	$ 392,371	$ 261,581
40	Hydro O&M South	KH	1/1/2027	Electrical Machinist	1	$ 163,488	$ 163,488	5000560	MLode Maint Generators	Base Maintenance Improvements	$ 163,488	Various	Supports specific capital work as it	$ (9,809)	$ 153,679	$ 9,809
41	Hydro O&M South	KH	1/1/2027	Communications Technician	2	$ 163,488	$ 326,976	5000452	MLode Maint TCom/Computer Network	Base Maintenance Improvements	$ 326,976	Various	Supports specific capital work as it	$ (19,619)	$ 307,357	$ 19,619
42	Hydro O&M South	KH	1/1/2027	Instrument and Control Technician	4	$ 163,488	$ 653,952	5000560	MLode Maint Generators	Base Maintenance Improvements	$ 653,952	Various	Supports specific capital work as it	$ (261,581)	$ 392,371	$ 261,581
43	Hydro O&M South	KH	1/1/2027	Electrical Machinist	1	$ 163,488	$ 163,488	5000561	KCV Maint Generators	Base Maintenance Improvements	$ 163,488	Various	Supports specific capital work as it	$ (9,809)	$ 153,679	$ 9,809
44	Hydro O&M South	KH	1/1/2027	Electrician	1	$ 163,488	$ 163,488	5000561	KCV Maint Generators	Base Maintenance Improvements	$ 163,488	Various	Supports specific capital work as it	$ (9,809)	$ 153,679	$ 9,809
45	Hydro O&M South	KH	1/1/2027	Instrument and Control Technician	4	$ 163,488	$ 653,952	5000561	KCV Maint Generators	Base Maintenance Improvements	$ 653,952	Various	Supports specific capital work as it	$ (261,581)	$ 392,371	$ 261,581
46	Hydro O&M South	KH	1/1/2027	Electrical Machinist	2	$ 163,488	$ 326,976	5000562	Helms Maint Generators	Base Maintenance Improvements	$ 326,976	Various	Supports specific capital work as it	$ (19,619)	$ 307,357	$ 19,619
47	Hydro O&M South	KH	1/1/2027	Electrical Technician	1	$ 163,488	$ 163,488	5000562	Helms Maint Generators	Base Maintenance Improvements	$ 163,488	Various	Supports specific capital work as it	$ (9,809)	$ 153,679	$ 9,809
48	Hydro O&M South	KH	1/1/2027	Instrument and Control Technician	4	$ 163,488	$ 653,952	5000562	Helms Maint Generators	Base Maintenance Improvements	$ 653,952	Various	Supports specific capital work as it	$ (261,581)	$ 392,371	$ 261,581
49	Hydro O&M South	KH	1/1/2027	Plant Engineer	1	$ 180,000	$ 180,000	5000562	Helms Maint Generators	Base Maintenance Improvements	$ 180,000	N/A	N/A - Will not support capital work	$ -	$ 180,000	$ -
50	Hydro O&M South	KH	1/1/2027	Housekeeper	0.65	$ 91,000	$ 59,150	5000562	Helms Maint Generators	Base Maintenance Improvements	$ 59,150	N/A	N/A - Will not support capital work	$ -	$ 59,150	$ -
51	Hydro O&M South	KH	1/1/2027	Cook	0.65	$ 91,000	$ 59,150	5000562	Helms Maint Generators	Base Maintenance Improvements	$ 59,150	N/A	N/A - Will not support capital work	$ -	$ 59,150	$ -
52	Hydro O&M North	KI	1/1/2027	Utility Worker	2	$ 91,000	$ 182,000	5000541	Shasta Maint Infrastructure	Base Infrastructure Maintenance Improvements	$ 182,000	N/A	N/A - Will not support capital work	$ -	$ 182,000	$ -
53	Hydro O&M North	KI	1/1/2027	Utility Worker - Camp One	1	$ 91,000	$ 91,000	5015290	Camp One Maint Infrastructure	Base Infrastructure Maintenance Improvements	$ 91,000	N/A	N/A - Will not support capital work	$ -	$ 91,000	$ -
54	Hydro O&M North	KI	1/1/2027	Utility Worker - DeSabla	1	$ 91,000	$ 91,000	5000542	DeSabla Maint Infrastructure	Base Infrastructure Maintenance Improvements	$ 91,000	N/A	N/A - Will not support capital work	$ -	$ 91,000	$ -
55	Hydro O&M South	KI	1/1/2027	Utility Worker	2	$ 91,000	$ 182,000	5000543	Drum Maint Infrastructure	Base Infrastructure Maintenance Improvements	$ 182,000	N/A	N/A - Will not support capital work	$ -	$ 182,000	$ -
56	Hydro O&M South	KI	1/1/2027	Utility Worker	2	$ 91,000	$ 182,000	5000544	ML Maint Infrastructure	Base Infrastructure Maintenance Improvements	$ 182,000	N/A	N/A - Will not support capital work	$ -	$ 182,000	$ -
57	Hydro O&M South	KI	1/1/2027	Utility Worker	2	$ 91,000	$ 182,000	5000545	KCV Maint Infrastructure	Base Infrastructure Maintenance Improvements	$ 182,000	N/A	N/A - Will not support capital work	$ -	$ 182,000	$ -
58	Hydro O&M South	KI	1/1/2027	Utility Worker	2	$ 91,000	$ 182,000	5000546	Helms Maint Infrastructure	Base Infrastructure Maintenance Improvements	$ 182,000	N/A	N/A - Will not support capital work	$ -	$ 182,000	$ -
59	General Constructi	Various	1/1/2025	Construction Manager, Expert, ESC	5	$ 166,000	$ 830,000	Various	Forecast to support capital 100%		$ -	Various	Forecast to support capital 100%	$ -	$ -	$ 830,000
60	Engineering	Various	1/1/2025	Design Engineer, ESC	1	$ 119,000	$ 119,000	Various	Forecast to support capital 100%		$ -	Various	Forecast to support capital 100%	$ -	$ -	$ 119,000
61	Engineering	Various	1/1/2025	Drafter, ESC	3	$ 86,000	$ 258,000	Various	Forecast to support capital 100%		$ -	Various	Forecast to support capital 100%	$ -	$ -	$ 258,000
62	Engineering	Various	1/1/2025	Engineer Assistant, ESC	2	$ 97,000	$ 194,000	Various	Forecast to support capital 100%		$ -	Various	Forecast to support capital 100%	$ -	$ -	$ 194,000

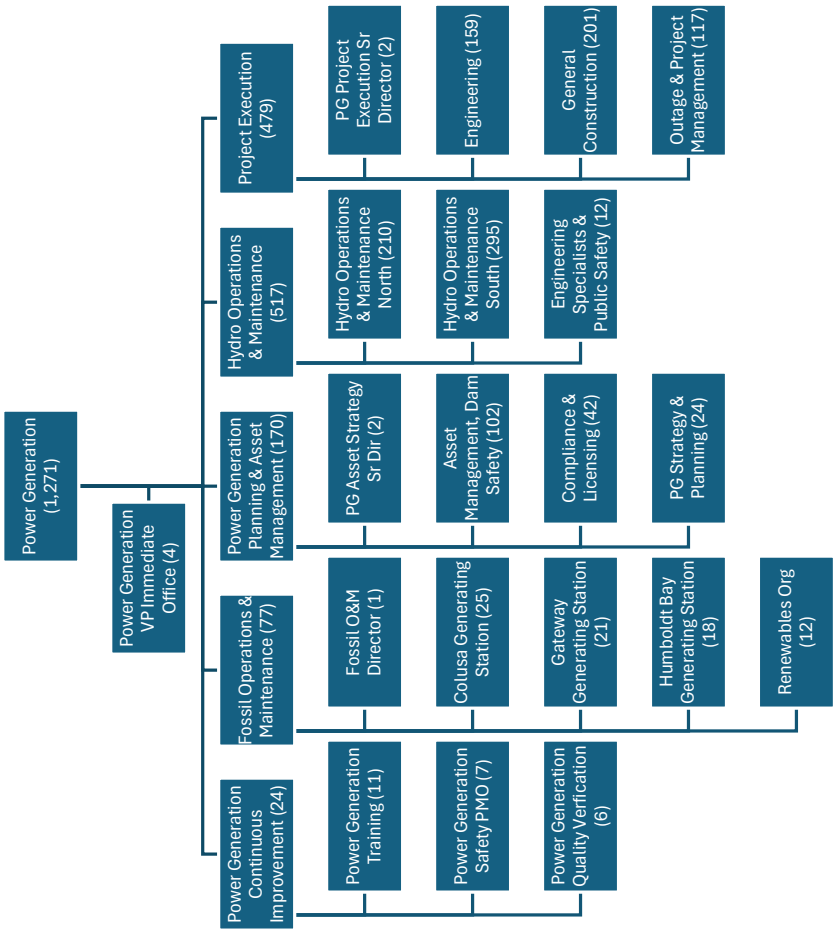
Pacific Gas and Electric Company
2027 General Rate Case
Exhibit (PG&E-5), Chapter 3
Hydro Operations
Forecast Headcount Growth and Cost

Line No.	Sub-Organization	MWC	Hiring Date Assumption	Position Name	FTEs	Salary per FTE	Total Salary Cost	Expense Planning Order Impacted	Expense Planning Order Description	Testimony Cost Driver Category	Expense Cost	Capital Planning Order Impacted	Capital Planning Order Description	Capital Credit to Expense	Net Expense Impact	Net Capital Impact
63	Engineering	Various	1/1/2025	Entry Engineer	6	$ 90,000	$ 540,000	Various	Forecast to support capital 100%		$ -	Various	Forecast to support capital 100%	$ -	$ -	$ 540,000
64	General Constructi	Various	1/1/2025	Senior Inspector	2	$ 169,000	$ 338,000	Various	Forecast to support capital 100%		$ -	Various	Forecast to support capital 100%	$ -	$ -	$ 338,000
65	General Constructi	Various	1/1/2025	Apprentice Electrical Technician, Journ	4	$ 118,000	$ 472,000	Various	Forecast to support capital 100%		$ -	Various	Forecast to support capital 100%	$ -	$ -	$ 472,000
66	Outage & Project M	Various	1/1/2025	Project Management Analyst, ESC	9	$ 108,000	$ 972,000	Various	Forecast to support capital 100%		$ -	Various	Forecast to support capital 100%	$ -	$ -	$ 972,000
67	Outage & Project M	Various	1/1/2025	PG Specialist, ESC	1	$ 118,000	$ 118,000	Various	Forecast to support capital 100%		$ -	Various	Forecast to support capital 100%	$ -	$ -	$ 118,000
68	Outage & Project M	Various	1/1/2025	Principal	2	$ 197,000	$ 394,000	Various	Forecast to support capital 100%		$ -	Various	Forecast to support capital 100%	$ -	$ -	$ 394,000
69	Engineering	Various	1/1/2025	Project Engineer, ESC	20	$ 140,000	$2,800,000	Various	Forecast to support capital 100%		$ -	Various	Forecast to support capital 100%	$ -	$ -	$ 2,800,000
70	Outage & Project M	Various	1/1/2025	Project Manager, ESC	5	$ 140,000	$ 700,000	Various	Forecast to support capital 100%		$ -	Various	Forecast to support capital 100%	$ -	$ -	$ 700,000
71	General Constructi	Various	1/1/2025	Routine Field Clerk, IBEW	1	$ 97,000	$ 97,000	Various	Forecast to support capital 100%		$ -	Various	Forecast to support capital 100%	$ -	$ -	$ 97,000
72	Engineering	Various	1/1/2025	SCADA Specialist, Sr, ESC	5	$ 132,000	$ 660,000	Various	Forecast to support capital 100%		$ -	Various	Forecast to support capital 100%	$ -	$ -	$ 660,000
73	Engineering	Various	1/1/2025	Supervisor	6	$ 175,000	$1,050,000	Various	Forecast to support capital 100%		$ -	Various	Forecast to support capital 100%	$ -	$ -	$ 1,050,000
74	General Constructi	Various	1/1/2025	Utility Worker & Field Clerks, IBEW	27	$ 91,000	$2,457,000	Various	Forecast to support capital 100%		$ -	Various	Forecast to support capital 100%	$ -	$ -	$ 2,457,000
75	Compliance & Lice	Various	1/1/2025	License Coordinators, ESC	4	$ 150,000	$ 600,000	Various	Forecast to support capital 100%		$ -	Various	Forecast to support capital 100%	$ -	$ -	$ 600,000
76	Outage & Project M	Various	1/1/2025	Primavera P6 Scheduler, ESC	5	$ 135,000	$ 675,000	Various	Forecast to support capital 100%		$ -	Various	Forecast to support capital 100%	$ -	$ -	$ 675,000
77	Engineering	Various	1/1/2025	Technical Writer, Sr, ESC	2	$ 178,000	$ 356,000	Various	Forecast to support capital 100%		$ -	Various	Forecast to support capital 100%	$ -	$ -	$ 356,000
78	Engineering	Various	1/1/2025	WP Portfolio Specialist (BS&T), Enginee	4	$ 164,000	$ 656,000	Various	Forecast to support capital 100%		$ -	Various	Forecast to support capital 100%	$ -	$ -	$ 656,000
79	PG Strategy & Plan	Various	1/1/2025	Business Planner	0	$ 120,000	$ -	Various	Forecast to support capital 100%		$ -	Various	Forecast to support capital 100%	$ -	$ -	$ -
80	General Constructi	Various	1/1/2027	Electrical Technician, IBEW	14	$ 171,662	$2,403,268	Various	Forecast to support capital 100%		$ -	Various	Forecast to support capital 100%	$ -	$ -	$ 2,403,268
81	General Constructi	Various	1/1/2027	Inspection Supervisor	1	$ 200,000	$ 200,000	Various	Forecast to support capital 100%		$ -	Various	Forecast to support capital 100%	$ -	$ -	$ 200,000
82	Compliance & Lice	IG	1/1/2027	Power Gen Project Manager-ESC	3	$ 140,000	$ 420,000	(Non-Earnin	McCloud-Pit New LC Implementation Activities	FERC License Conditions	$ 420,000	N/A	N/A - Will not support capital work	$ -	$ 420,000	$ -
83	Compliance & Lice	IG	1/1/2027	Electric Program Manager, Expert	1	$ 157,000	$ 157,000	(Non-Earnin	McCloud-Pit New LC Implementation Activities	FERC License Conditions	$ 157,000	N/A	N/A - Will not support capital work	$ -	$ 157,000	$ -
84	Engineering	KG	1/1/2027	Power Gen Project Manager-ESC	1	$ 142,000	$ 142,000	5263273	NERC Regulations & Guidance	Growing Training and Safety Program Needs	$ 142,000	N/A	N/A - Will not support capital work	$ -	$ 142,000	$ -
85	PG Continuous Imp	KG	1/1/2027	Program Manager, Expert	2	$ 157,000	$ 314,000	5060451	PCC 15992 - PG Training	Growing Training and Safety Program Needs	$ 314,000	N/A	N/A - Will not support capital work	$ -	$ 314,000	$ -
86	PG Continuous Imp	KG	1/1/2027	Field Training Coordinator, Expert	1	$ 146,000	$ 146,000	5060451	PCC 15992 - PG Training	Growing Training and Safety Program Needs	$ 146,000	N/A	N/A - Will not support capital work	$ -	$ 146,000	$ -
87	PG Continuous Imp	KG	1/1/2027	Safety Program Manager, Principal	2	$ 180,000	$ 360,000	5060451	PCC 15992 - PG Training	Growing Training and Safety Program Needs	$ 360,000	N/A	N/A - Will not support capital work	$ -	$ 360,000	$ -
88	PG Continuous Imp	KG	1/1/2027	Safety Program Manager, Expert	1	$ 157,000	$ 157,000	5060451	PCC 15992 - PG Training	Growing Training and Safety Program Needs	$ 157,000	N/A	N/A - Will not support capital work	$ -	$ 157,000	$ -
89	PG Continuous Imp	KG	1/1/2027	Program Manager, Expert	2	$ 157,000	$ 314,000	5060451	PCC 15992 - PG Training	Growing Training and Safety Program Needs	$ 314,000	N/A	N/A - Will not support capital work	$ -	$ 314,000	$ -

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Power Generation
Organizational Chart for 2024



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Power Generation
Organizational Chart for 2027



Pacific Gas and Electric Company
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Hydro Operations
Historical Forced Outage Factor by Unit

Line No.	UnitName	2020	2021	2022	2023	2024	Comments
1	ALTA POWERHOUSE UNIT #1	7.35%	3.42%	0.42%	0.56%	0.14%	
2	BALCH PH 1 UNIT 1	0.04%	0.12%	1.08%	1.00%	3.75%	
3	BALCH PH 2 UNIT 2	0.07%	0.04%	0.03%	1.38%	1.95%	
4	BALCH PH 2 UNIT 3	0.06%	0.53%	0.00%	1.75%	2.19%	
5	BELDEN POWERHOUSE	1.32%	7.90%	3.96%	53.50%	14.68%	
6	BUCKS CREEK PH UNIT #1	0.00%	11.86%	0.25%	3.04%	7.53%	
7	BUCKS CREEK PH UNIT #2	0.76%	0.00%	0.00%	0.00%	0.00%	
8	BUTT VALLEY POWERHOUSE	3.97%	38.84%	0.88%	9.25%	0.87%	
9	CARIBOU #1 POWERHOUSE UNIT #1	1.17%	0.00%	1.43%	35.54%	0.64%	
10	CARIBOU #1 POWERHOUSE UNIT #2	0.63%	14.57%	0.25%	0.06%	0.10%	
11	CARIBOU #1 POWERHOUSE UNIT #3	1.18%	14.66%	0.32%	0.16%	0.10%	
12	CARIBOU #2 POWERHOUSE UNIT #4	3.03%	14.00%	0.01%	0.05%	0.95%	
13	CARIBOU #2 POWERHOUSE UNIT #5	2.73%	14.02%	0.08%	46.08%	0.00%	
14	CENTERVILLE PH UNIT NO.1	NA	NA	NA	NA	NA	Mothball
15	CENTERVILLE PH UNIT NO.2	NA	NA	NA	NA	NA	Mothball
16	CHILI BAR POWERHOUSE UNIT #1	2.97%	0.00%	NA	NA	NA	Sold 11/20/2020
17	COLEMAN PH UNIT NO.1	5.23%	1.14%	1.19%	2.69%	0.08%	
18	COW CREEK PH UNIT NO.1	1.11%	3.23%	0.00%	80.04%	100.00%	
19	COW CREEK PH UNIT NO.2	0.15%	1.92%	0.27%	80.06%	100.00%	
20	CRANE VALLEY PH UNIT 1	16.11%	100.00%	72.20%	3.54%	0.52%	
21	CRESTA POWERHOUSE UNIT #1	0.02%	0.93%	0.09%	0.18%	3.47%	
22	CRESTA POWERHOUSE UNIT #2	0.02%	0.90%	0.05%	0.00%	2.97%	
23	DE SABLA PH UNIT NO.1	11.45%	14.65%	0.76%	13.55%	1.18%	
24	DEER CREEK PH UNIT #1	4.41%	20.30%	5.68%	18.40%	NA	Sold 11/09/2023
25	DRUM POWERHOUSE #1, UNIT #1	1.05%	2.93%	0.01%	0.00%	31.33%	
26	DRUM POWERHOUSE #1, UNIT #2	1.05%	0.00%	0.01%	0.98%	33.80%	
27	DRUM POWERHOUSE #1, UNIT #3	1.05%	0.00%	0.01%	2.67%	36.28%	
28	DRUM POWERHOUSE #1, UNIT #4	1.05%	0.00%	0.65%	7.65%	37.73%	
29	DRUM POWERHOUSE #2, UNIT #5	1.21%	0.01%	0.04%	0.17%	3.99%	
30	DUTCH FLAT POWERHOUSE UNIT #1	2.04%	0.15%	0.49%	1.13%	0.05%	
31	ELECTRA POWERHOUSE UNIT #1	0.03%	0.06%	1.04%	0.35%	0.23%	
32	ELECTRA POWERHOUSE UNIT #2	0.28%	0.07%	0.84%	0.28%	0.00%	
33	ELECTRA POWERHOUSE UNIT #3	0.14%	0.00%	3.89%	1.65%	0.00%	
34	HAAS PH UNIT 1	0.49%	0.41%	3.83%	0.66%	1.45%	
35	HAAS PH UNIT 2	0.60%	0.41%	0.02%	6.37%	2.16%	
36	HALSEY POWERHOUSE UNIT #1	6.52%	1.48%	5.70%	0.00%	0.29%	
37	HAMILTON BRANCH PH UNIT #1	NA	NA	NA	NA	NA	Mothball
38	HAMILTON BRANCH PH UNIT #2	100.00%	0.00%	0.00%	0.00%	0.00%	Forced
39	HAT CREEK PH 1 UNIT 1	0.67%	0.10%	0.38%	0.08%	0.04%	
40	HAT CREEK PH 2 UNIT 1	15.57%	4.30%	22.29%	83.21%	26.27%	
41	INSKIP PH UNIT NO.1	100.00%	49.32%	0.00%	0.00%	0.00%	Forced
42	JAMES B. BLACK PH UNIT #1	0.28%	0.00%	0.08%	3.10%	1.33%	
43	JAMES B. BLACK PH UNIT #2	0.24%	0.00%	0.12%	0.37%	0.54%	
44	KERCKHOFF PH 1 UNIT 1	NA	NA	NA	NA	NA	Mothball
45	KERCKHOFF PH 1 UNIT 3	NA	NA	NA	NA	NA	Mothball

Pacific Gas and Electric Company
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Hydro Operations
Historical Forced Outage Factor by Unit

Line No.	UnitName	2020	2021	2022	2023	2024	Comments
46	KERCKHOFF PH 2 UNIT 1	6.98%	0.73%	0.20%	14.29%	6.45%	
47	KERN CANYON PH UNIT 1	NA	NA	NA	NA	NA	Sold 12/29/2020
48	KILARC PH UNIT NO.1	100.00%	100.00%	0.00%	0.00%	0.00%	Forced
49	KINGS RIVER PH UNIT 1	0.06%	9.60%	0.15%	2.08%	2.96%	
50	LIME SADDLE PH UNIT NO.1	100.00%	95.79%	0.00%	0.00%	0.00%	
51	LIME SADDLE PH UNIT NO.2	100.00%	95.79%	0.00%	0.00%	0.00%	
52	NARROWS POWERHOUSE #1 UNIT #1	9.61%	0.00%	0.00%	NA	NA	Sold 3/31/2020
53	NEWCASTLE POWERHOUSE UNIT #1	0.77%	75.61%	56.53%	2.80%	55.24%	
54	OAK FLAT POWERHOUSE UNIT #1	3.98%	47.15%	0.00%	0.00%	0.00%	
55	PHOENIX POWERHOUSE UNIT #1	2.89%	4.51%	2.64%	18.82%	12.16%	
56	PIT PH 1 UNIT 1	0.03%	0.00%	18.79%	43.10%	0.00%	
57	PIT PH 1 UNIT 2	0.47%	20.66%	0.02%	0.21%	0.02%	
58	PIT PH 3 UNIT 1	1.01%	10.14%	43.48%	0.05%	0.06%	
59	PIT PH 3 UNIT 2	0.46%	0.02%	45.96%	0.00%	0.00%	
60	PIT PH 3 UNIT 3	0.46%	10.16%	43.55%	1.23%	0.03%	
61	PIT PH 4 UNIT 1	0.02%	0.09%	0.73%	0.44%	0.99%	
62	PIT PH 4 UNIT 2	0.12%	0.00%	0.76%	0.44%	0.21%	
63	PIT PH 5 UNIT 1	0.00%	0.01%	0.00%	0.04%	0.00%	
64	PIT PH 5 UNIT 2	0.84%	0.05%	0.00%	0.02%	0.02%	
65	PIT PH 5 UNIT 3	0.00%	0.25%	0.00%	0.02%	0.06%	
66	PIT PH 5 UNIT 4	0.00%	18.84%	0.00%	0.30%	0.08%	
67	PIT PH 6 UNIT 1	5.38%	0.02%	0.00%	0.03%	0.19%	
68	PIT PH 6 UNIT 2	5.40%	0.02%	0.06%	0.12%	0.13%	
69	PIT PH 7 UNIT 1	0.00%	0.04%	0.01%	0.07%	0.08%	
70	PIT PH 7 UNIT 2	15.22%	10.43%	58.10%	0.00%	0.01%	
71	POE POWERHOUSE UNIT #1	1.88%	2.58%	5.60%	0.83%	0.08%	
72	POE POWERHOUSE UNIT #2	0.21%	0.93%	0.30%	1.27%	0.04%	
73	POTTER VALLEY UNIT 1	94.26%	82.16%	100.00%	49.31%	0.00%	
74	POTTER VALLEY UNIT 3	3.75%	72.73%	100.00%	49.31%	0.00%	
75	POTTER VALLEY UNIT 4	3.25%	59.54%	100.00%	49.31%	0.00%	
76	ROCK CREEK POWERHOUSE UNIT #1	2.50%	0.98%	0.05%	0.11%	0.04%	
77	ROCK CREEK POWERHOUSE UNIT #2	2.30%	0.00%	0.13%	0.30%	0.27%	
78	SALT SPRINGS PH UNIT #1	18.51%	27.43%	5.95%	0.00%	1.26%	
79	SALT SPRINGS PH UNIT #2	0.86%	12.13%	0.65%	3.46%	2.30%	
80	SAN JOAQUIN 1A PH UNIT 1	100.00%	100.00%	100.00%	100.00%	100.00%	Forced
81	SAN JOAQUIN 2 PH UNIT 1	100.00%	100.00%	45.97%	90.95%	100.00%	Forced
82	SAN JOAQUIN 3 PH UNIT 1	100.00%	49.59%	0.00%	0.00%	0.00%	Forced
83	SOUTH PH UNIT NO.1	0.28%	6.03%	1.11%	2.63%	3.00%	
84	SPAULDING PH #1, UNIT #1	4.45%	0.84%	13.76%	9.03%	38.66%	
85	SPAULDING PH #2, UNIT #1	0.94%	0.28%	5.33%	70.75%	100.00%	
86	SPAULDING PH #3, UNIT #1	3.81%	2.54%	11.92%	6.84%	17.35%	
87	SPRING GAP POWERHOUSE UNIT #1	0.97%	20.41%	23.37%	1.27%	0.48%	
88	STANISLAUS POWERHOUSE UNIT #1	0.24%	6.59%	10.68%	0.30%	0.25%	
89	TIGER CREEK PH UNIT #1	0.98%	0.28%	1.71%	6.47%	0.01%	
90	TIGER CREEK PH UNIT #2	1.01%	0.64%	0.23%	6.20%	3.69%	

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Hydro Operations
Historical Forced Outage Factor by Unit

Line No.	UnitName	2020	2021	2022	2023	2024	Comments
91	TOADTOWN PH UNIT NO.1	11.03%	14.99%	2.48%	8.88%	1.03%	
92	TULE RIVER PH UNIT 1	NA	NA	NA	NA	NA	Sold 05/2023
93	TULE RIVER PH UNIT 2	NA	NA	NA	NA	NA	Sold 05/2023
94	VOLTA 1 PH UNIT NO.1	1.86%	1.35%	13.10%	92.96%	100.00%	
95	VOLTA 2 PH UNIT NO.2	12.61%	8.60%	4.89%	1.40%	4.16%	
96	WEST POINT PH UNIT #1	2.32%	0.12%	0.42%	0.54%	0.09%	
97	WISE POWERHOUSE #1, UNIT #1	0.00%	1.65%	5.85%	1.90%	5.32%	
98	WISE POWERHOUSE #2, UNIT #1	0.00%	0.00%	0.00%	0.33%	0.00%	
99	WISHON PH 1 UNIT 1	5.18%	0.49%	16.33%	19.34%	1.73%	
100	WISHON PH 1 UNIT 2	20.05%	82.48%	15.94%	18.41%	39.91%	
101	WISHON PH 1 UNIT 3	5.17%	0.49%	16.34%	18.92%	2.72%	
102	WISHON PH 1 UNIT 4	17.62%	100.00%	83.29%	24.04%	3.49%	
103	Conventional Hydro MW weighted FOF	3.01%	5.73%	5.73%	8.49%	3.95%	
104							
105	HELMS POWERHOUSE UNIT 1	0.01%	1.77%	0.47%	0.75%	0.62%	
106	HELMS POWERHOUSE UNIT 2	0.04%	0.16%	0.28%	1.92%	0.00%	
107	HELMS POWERHOUSE UNIT 3	0.43%	10.25%	0.35%	2.40%	0.29%	
108	Pumped Storage MW weighted FOF	0.16%	4.06%	0.37%	1.69%	0.30%	
109							
110	Hydro System	2.11%	5.20%	4.04%	6.34%	2.79%	
111							
112	Notes						
113	ALTA POWERHOUSE UNIT #2	Retired 2011					
114	CENTERVILLE PH UNIT NO.1	Mothball 01/2014					
115	CENTERVILLE PH UNIT NO.2	Mothball 01/2014					
116	COAL CANYON PH UNIT NO.1	Retired 2013					
117	HAMILTON BRANCH PH UNIT #1	Mothball 01/2016					
118	KERCKHOFF PH 1 UNIT 1	Mothball 09/2018					
119	KERCKHOFF PH 1 UNIT 2	Retired 2013					
120	KERCKHOFF PH 1 UNIT 3	Mothball 09/2018					
121	KERN CANYON PH UNIT 1	Mothball 06/2017 - Sold 12/2020					
122	KILARC PH UNIT NO.2	Mothball 02/2017 - Retired 10/17/24					
123	MERCED FALLS PH UNIT 1	Sold 02/2017					
124	NARROWS POWERHOUSE #1 UNIT #1	Sold 3/2020					
125	TULE RIVER PH UNIT 1	Sold 05/2023					
126	TULE RIVER PH UNIT 2	Sold 05/2023					

Pacific Gas and Electric Company
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Hydro Operations
Historical Equivalent Availability Factor by Unit

Line No.	UnitName	2020	2021	2022	2023	2024	Comments
1	ALTA POWERHOUSE UNIT #1	85.82%	89.43%	95.87%	78.80%	61.73%	
2	BALCH PH 1 UNIT 1	95.21%	92.45%	93.11%	92.49%	91.14%	
3	BALCH PH 2 UNIT 2	90.86%	88.99%	94.18%	90.86%	90.69%	
4	BALCH PH 2 UNIT 3	92.90%	92.92%	94.50%	89.15%	91.29%	
5	BELDEN POWERHOUSE	96.37%	86.78%	74.14%	41.46%	68.71%	
6	BUCKS CREEK PH UNIT #1	37.79%	47.63%	96.04%	63.19%	92.39%	
7	BUCKS CREEK PH UNIT #2	37.26%	0.00%	0.00%	0.00%	0.00%	
8	BUTT VALLEY POWERHOUSE	85.36%	51.76%	91.35%	86.66%	90.55%	
9	CARIBOU #1 POWERHOUSE UNIT #1	96.18%	13.88%	23.97%	56.58%	88.91%	
10	CARIBOU #1 POWERHOUSE UNIT #2	96.82%	63.57%	91.41%	94.38%	95.06%	
11	CARIBOU #1 POWERHOUSE UNIT #3	96.80%	67.84%	89.17%	94.45%	94.78%	
12	CARIBOU #2 POWERHOUSE UNIT #4	92.95%	79.74%	93.52%	94.81%	81.30%	
13	CARIBOU #2 POWERHOUSE UNIT #5	93.44%	78.60%	93.22%	36.75%	0.00%	
14	CENTERVILLE PH UNIT NO.1	NA	NA	NA	NA	NA	Mothball
15	CENTERVILLE PH UNIT NO.2	NA	NA	NA	NA	NA	Mothball
16	CHILI BAR POWERHOUSE UNIT #1	96.93%	100.00%	NA	NA	NA	Sold 11/20/2020
17	COLEMAN PH UNIT NO.1	90.71%	90.09%	91.93%	93.61%	82.45%	
18	COW CREEK PH UNIT NO.1	95.99%	89.76%	96.52%	19.92%	0.00%	
19	COW CREEK PH UNIT NO.2	97.07%	91.07%	95.85%	19.94%	0.00%	
20	CRANE VALLEY PH UNIT 1	67.30%	0.00%	27.79%	69.09%	51.94%	
21	CRESTA POWERHOUSE UNIT #1	95.00%	93.75%	74.70%	60.24%	93.17%	
22	CRESTA POWERHOUSE UNIT #2	96.26%	92.95%	74.75%	19.02%	92.12%	
23	DE SABLA PH UNIT NO.1	82.42%	71.86%	91.97%	86.45%	88.37%	
24	DEER CREEK PH UNIT #1	86.36%	72.62%	83.87%	69.30%	NA	Sold 11/09/2023
25	DRUM POWERHOUSE #1, UNIT #1	95.25%	94.84%	96.82%	94.17%	57.33%	
26	DRUM POWERHOUSE #1, UNIT #2	95.31%	96.17%	96.83%	93.17%	54.56%	
27	DRUM POWERHOUSE #1, UNIT #3	89.84%	95.48%	97.11%	90.45%	56.62%	
28	DRUM POWERHOUSE #1, UNIT #4	87.71%	89.01%	96.19%	85.13%	50.99%	
29	DRUM POWERHOUSE #2, UNIT #5	93.23%	80.84%	93.11%	76.78%	89.69%	
30	DUTCH FLAT POWERHOUSE UNIT #1	92.92%	94.06%	92.86%	89.04%	92.08%	
31	ELECTRA POWERHOUSE UNIT #1	94.71%	87.45%	91.57%	91.19%	83.31%	
32	ELECTRA POWERHOUSE UNIT #2	75.43%	50.06%	92.09%	92.08%	81.82%	
33	ELECTRA POWERHOUSE UNIT #3	92.64%	87.46%	91.77%	77.16%	80.29%	
34	HAAS PH UNIT 1	92.45%	85.42%	70.75%	42.02%	93.25%	
35	HAAS PH UNIT 2	92.10%	88.20%	49.28%	75.36%	88.41%	
36	HALSEY POWERHOUSE UNIT #1	77.36%	88.74%	19.88%	0.00%	25.39%	
37	HAMILTON BRANCH PH UNIT #1	NA	NA	NA	NA	NA	Mothball
38	HAMILTON BRANCH PH UNIT #2	0.00%	100.00%	100.00%	100.00%	100.00%	Forced
39	HAT CREEK PH 1 UNIT 1	98.19%	93.50%	96.84%	96.38%	96.13%	
40	HAT CREEK PH 2 UNIT 1	79.05%	48.65%	60.75%	16.79%	64.20%	
41	INSKIP PH UNIT NO.1	0.00%	50.68%	100.00%	100.00%	100.00%	Forced
42	JAMES B. BLACK PH UNIT #1	87.56%	97.27%	87.71%	93.08%	66.47%	

43	JAMES B. BLACK PH UNIT #2	91.60%	91.66%	87.67%	98.09%	94.69%	
44	KERCKHOFF PH 1 UNIT 1	NA	NA	NA	NA	NA	Mothball
45	KERCKHOFF PH 1 UNIT 3	NA	NA	NA	NA	NA	Mothball
46	KERCKHOFF PH 2 UNIT 1	92.91%	53.04%	92.70%	75.16%	77.08%	
47	KERN CANYON PH UNIT 1	NA	NA	NA	NA	NA	Sold 12/29/2020
48	KILARC PH UNIT NO.1	0.00%	0.00%	100.00%	100.00%	100.00%	Forced
49	KINGS RIVER PH UNIT 1	94.54%	82.77%	91.89%	79.68%	91.81%	
50	LIME SADDLE PH UNIT NO.1	0.00%	4.21%	100.00%	100.00%	100.00%	
51	LIME SADDLE PH UNIT NO.2	0.00%	4.21%	100.00%	100.00%	100.00%	
52	NARROWS POWERHOUSE #1 UNIT #1	90.39%	100.00%	100.00%	NA	NA	Sold 3/31/2020
53	NEWCASTLE POWERHOUSE UNIT #1	93.98%	18.07%	39.44%	84.78%	25.29%	
54	OAK FLAT POWERHOUSE UNIT #1	92.11%	46.58%	100.00%	100.00%	100.00%	
55	PHOENIX POWERHOUSE UNIT #1	92.06%	90.30%	94.15%	76.18%	81.41%	
56	PIT PH 1 UNIT 1	63.75%	0.00%	14.92%	48.78%	92.21%	
57	PIT PH 1 UNIT 2	90.06%	75.37%	60.61%	90.48%	92.19%	
58	PIT PH 3 UNIT 1	91.95%	78.67%	56.50%	96.52%	92.99%	
59	PIT PH 3 UNIT 2	72.66%	78.78%	53.65%	96.60%	94.77%	
60	PIT PH 3 UNIT 3	73.40%	78.64%	56.41%	95.36%	97.13%	
61	PIT PH 4 UNIT 1	92.88%	71.69%	95.62%	95.41%	84.41%	
62	PIT PH 4 UNIT 2	94.76%	71.79%	95.49%	95.67%	85.20%	
63	PIT PH 5 UNIT 1	92.78%	94.23%	96.18%	96.64%	90.47%	
64	PIT PH 5 UNIT 2	91.98%	94.40%	96.60%	96.42%	89.98%	
65	PIT PH 5 UNIT 3	97.00%	97.44%	95.71%	94.76%	86.28%	
66	PIT PH 5 UNIT 4	98.84%	61.89%	71.29%	94.82%	86.85%	
67	PIT PH 6 UNIT 1	71.71%	95.69%	92.08%	72.81%	94.11%	
68	PIT PH 6 UNIT 2	71.73%	94.22%	92.49%	73.78%	92.74%	
69	PIT PH 7 UNIT 1	94.74%	93.52%	77.27%	72.56%	96.10%	
70	PIT PH 7 UNIT 2	37.60%	81.54%	41.82%	80.84%	96.17%	
71	POE POWERHOUSE UNIT #1	86.53%	93.08%	84.64%	93.95%	75.13%	
72	POE POWERHOUSE UNIT #2	83.70%	93.83%	90.51%	93.69%	77.94%	
73	POTTER VALLEY UNIT 1	5.74%	10.37%	0.00%	50.69%	100.00%	
74	POTTER VALLEY UNIT 3	96.18%	19.80%	0.00%	50.69%	100.00%	
75	POTTER VALLEY UNIT 4	96.68%	32.77%	0.00%	50.69%	100.00%	
76	ROCK CREEK POWERHOUSE UNIT #1	93.38%	98.86%	98.62%	78.49%	91.23%	
77	ROCK CREEK POWERHOUSE UNIT #2	94.18%	91.16%	97.99%	78.33%	91.34%	
78	SALT SPRINGS PH UNIT #1	63.27%	69.69%	85.31%	92.88%	84.74%	
79	SALT SPRINGS PH UNIT #2	92.60%	74.36%	93.65%	89.61%	92.54%	
80	SAN JOAQUIN 1A PH UNIT 1	0.00%	0.00%	0.00%	0.00%	0.00%	Forced
81	SAN JOAQUIN 2 PH UNIT 1	0.00%	0.00%	16.13%	5.75%	0.00%	Forced
82	SAN JOAQUIN 3 PH UNIT 1	0.00%	50.41%	100.00%	100.00%	100.00%	Forced
83	SOUTH PH UNIT NO.1	45.55%	86.65%	87.95%	90.18%	80.78%	
84	SPAULDING PH #1, UNIT #1	89.05%	92.38%	79.52%	84.86%	60.43%	
85	SPAULDING PH #2, UNIT #1	94.58%	91.86%	88.69%	19.30%	0.00%	
86	SPAULDING PH #3, UNIT #1	90.90%	73.85%	79.34%	79.68%	73.88%	
87	SPRING GAP POWERHOUSE UNIT #1	89.81%	73.33%	75.53%	89.09%	91.22%	
88	STANISLAUS POWERHOUSE UNIT #1	89.50%	75.19%	81.94%	93.05%	74.55%	
89	TIGER CREEK PH UNIT #1	82.39%	85.95%	77.09%	81.79%	87.71%	
90	TIGER CREEK PH UNIT #2	85.41%	85.89%	74.57%	82.07%	86.63%	
91	TOADTOWN PH UNIT NO.1	83.34%	73.03%	90.20%	91.12%	86.67%	
92	TULE RIVER PH UNIT 1	NA	NA	NA	NA	NA	Sold 05/2023

93	TULE RIVER PH UNIT 2	NA	NA	NA	NA	NA	Sold 05/2023
94	VOLTA 1 PH UNIT NO.1	59.01%	93.51%	83.43%	7.04%	0.00%	
95	VOLTA 2 PH UNIT NO.2	57.37%	86.02%	90.67%	90.70%	87.85%	
96	WEST POINT PH UNIT #1	88.50%	91.30%	93.87%	73.81%	41.50%	
97	WISE POWERHOUSE #1, UNIT #1	84.73%	87.83%	93.21%	83.23%	82.65%	
98	WISE POWERHOUSE #2, UNIT #1	97.58%	88.79%	97.30%	98.85%	87.91%	
99	WISHON PH 1 UNIT 1	78.43%	60.52%	55.39%	58.03%	49.12%	
100	WISHON PH 1 UNIT 2	64.16%	17.52%	55.79%	58.95%	58.48%	
101	WISHON PH 1 UNIT 3	78.36%	66.91%	55.39%	58.15%	77.25%	
102	WISHON PH 1 UNIT 4	66.41%	0.00%	16.71%	53.08%	76.15%	
103	Conventional Hydro MW weighted FOF	86.60%	78.59%	80.81%	77.07%	80.72%	
104							
105	HELMS POWERHOUSE UNIT 1	78.68%	86.45%	55.00%	86.63%	60.40%	
106	HELMS POWERHOUSE UNIT 2	37.97%	88.41%	55.95%	89.45%	61.92%	
107	HELMS POWERHOUSE UNIT 3	83.35%	78.35%	56.35%	88.83%	61.63%	
108	Pumped Storage MW weighted FOF	66.67%	84.40%	55.77%	88.30%	61.32%	
109							
110	Hydro System	80.3%	80.4%	72.9%	80.6%	74.5%	
111							

112 Notes

113	ALTA POWERHOUSE UNIT #2	Retired 2011
114	CENTERVILLE PH UNIT NO.1	Mothball 01/2014
115	CENTERVILLE PH UNIT NO.2	Mothball 01/2014
116	COAL CANYON PH UNIT NO.1	Retired 2013
117	HAMILTON BRANCH PH UNIT #1	Mothball 01/2016
118	KERCKHOFF PH 1 UNIT 1	Mothball 09/2018
119	KERCKHOFF PH 1 UNIT 2	Retired 2013
120	KERCKHOFF PH 1 UNIT 3	Mothball 09/2018
121	KERN CANYON PH UNIT 1	Mothball 06/2017 - Sold 12/2020
122	KILARC PH UNIT NO.2	Mothball 02/2017 - Retired 10/17/24
123	MERCED FALLS PH UNIT 1	Sold 02/2017
124	NARROWS POWERHOUSE #1 UNIT #1	Sold 3/2020
125	TULE RIVER PH UNIT 1	Sold 05/2023
126	TULE RIVER PH UNIT 2	Sold 05/2023

Pacific Gas and Electric Company
2027 General Rate Case
Exhibit (PG&E-5), Chapter 3
Hydro Operations
FERC Relicensing Timetable

FERC LICENSE	PROJECT NAME	NORMAL MW CAPACITY	LICENSE EXPIRES	NOI FILING DEADLINE	APPLICATION * FILING DEADLINE / DATE FILED	ESTIMATED ORDER ** ISSUANCE	LICENSE STATUS
1061	Phoenix	2	8/31/2022	n/a	8/31/2020	Jun-25	License received 9/10/1992. FLA filed on 8/24/20. (In June 2022, the negotiations to transfer the project to TUD were paused.)
2105	Upper NF Feather River	362.3	10/31/2004	n/a	10/31/2002	Nov-25	Application filed 10/23/2002
96	Kerckhoff #1 and #2	180.4	11/30/2022	n/a	11/30/2020	Dec-26	License received 11/8/1976; amended 2013. DLA filed on 6/26/2020. FLA filed 11/24/20 for K2 only.
2310	Upper Drum	144	4/30/2013	n/a	4/30/2011	May-27	Application filed 4/12/11. 5/31/13 request to split Drum-Spaulding into 3 projects.
14531	Lower Drum	40	n/a	n/a	4/30/2011	May-27	5/31/13 request to split Drum-Spaulding into 3 projects.
803	DeSabla-Centerville	26.4	11-Oct-09	n/a	10/11/2007	Jun-28	FLA filed 10/2/2007
2106	McCloud - Pit	364	7/31/2011	n/a	7/31/2009	Dec-26	Application filed 7/16/2009
175	Balch #1 and #2	139	4/30/2026	n/a	4/18/2024	Apr-29	License received 4/18/1980. NOI and PAD was filed 4/19/21
2735	Helms	1212	4/30/2026	n/a	4/19/2024	Apr-29	License received 5/18/1976. NOI and PAD was filed 4/19/21
1121	*** Battle Creek Surrender	37.9	7/31/2026	n/a	TBD	TBD	On 10/23/20, PG&E informed FERC of its decision not to relicense the Project. PG&E will submit License Surrender Application and Decommissioning Plan to FERC three years after pending amendments are approved (Due date TBD).
77	*** Potter Valley Surrender	9.2	4/14/2022	n/a	6/29/2025	Jun-28	On 1/25/19, PG&E withdrew its NOI and PAD and formally discontinued the Integrated Licensing Process. License Surrender Application and Decommissioning Plan are due to FERC by 6/29/25.
606	*** Kilarc-Cow Creek Surrender	5	3/27/2007	n/a	n/a		License Surrender Application filed 5/12/2009. Surrender Order issued 10/17/24. Kilarc PH not operational.
137	Mokelumne River	214.5	9/30/2031	9/30/2026	9/30/2029		License received 10/11/2001
2661	Hat Creek #1 and #2	17	9/30/2032	9/30/2027	9/30/2030		License received 10/30/2002
1962	Rock Creek-Cresta	195.7	9/30/2034	9/30/2029	9/30/2032		License received 10/25/2001. Normal Op. Cap. from 3/28/16 Order.
1988	Haas-Kings River	196	2/28/2041	2/28/2036	2/28/2039		License received 3/6/2001
2687	Pit #1	61	2/28/2042	2/28/2037	2/28/2040		License received 3/19/2003
233	Pit #3, #4 and #5	325	6/30/2043	6/30/2038	6/30/2041		License received 7/2/2007
1354	Crane Valley	28.7	8/31/2043	8/31/2038	8/31/2041		License received 9/16/2003
2130	Spring Gap-Stanislaus	98	3/31/2047	3/31/2042	3/31/2045		License received 4/24/2009
2107	Poe	120	11/30/2068	11/30/2063	11/30/2066		License received 12/17/2018 (50 years)
619	Bucks Creek	84.8	5/31/2072	5/31/2067	5/31/2070		License received 6/16/2022 (50 Years)

* Application' refers to either an Application for a New License or a License Surrender Application

** 'Order' refers to either an Order for a New License or an Order to Surrender

*** Projects that are being transferred or surrendered, that PG&E is not relicensing

Pacific Gas and Electric Company
2027 GRC
Exhibit (PG&E-5), Chapter 3
Hydro Operations
Decommissioning by Planning Order
(Thousands of Nominal Dollars)

Line No.	MWC	Planning Order	Description	2020 Recorded Adjusted	2021 Recorded Adjusted	2022 Recorded Adjusted	2023 Recorded Adjusted	2024 Recorded Adjusted	2025 Forecast	2026 Forecast	2027 Forecast	2028 Forecast	2029 Forecast	2030 Forecast
1	55	5906283	Inskip Diversion Dam Decommissioning	507	215	195	458	356	18,500					
2	55	5906381	Coleman Decommission Asbury Pipe			804	28							
3	55	5907101	Kerckhoff 1 Decommissioning									1,500		
4	55	5908361	Miocene - Coal Canyon/Lime Saddle					0	150	500	500	500	500	515
5	55	5908961	Potter Valley Decommissioning									87,771	89,702	92,393
6	IG	5280313	Kilarc Cow Decommissioning	-	-	-	-	-	-	-	16,971			
7			**Total**	**507**	**215**	**998**	**486**	**356**	**18,650**	**500**	**17,471**	**89,771**	**90,202**	**92,908**

Pacific Gas and Electric Company
2027 General Rate Case
Exhibit (PG&E-5), Chapter 3
Deferred Work Analysis Summary

The Hydro deferred work analysis follows the principles for determining if work was deferred set forth in PG&E's 2023 GRC Decision (D.23-11-069). Each MAT or MWC in this chapter was checked against those principles by following the checks listed below.

Check 1: The work was requested and authorized based on representations that it was needed to provide safe and reliable service.

Check 2: PG&E did not perform all of the authorized and funded work, as measured by authorized (explicit or imputed) units of work;

Check 2a: *The work is measured by units of work.*

Check 2b: *PG&E expects to perform fewer of such units during the 2023-2026 period.*

Check 3: PG&E continues to represent that the curtailed work is necessary to provide safe and reliable service

								Check 2					Units Comparison			Dollar Comparison ($000s)		
Line	2027 GRC Chapter	Type	MWC	MAT CODE	Description	Unit of Measure	Check 1 (See Note 1)	*Check 2a*	*Check 2b*	Check 3	Deferred Work (Yes or No)	Explanation	2023 to 2024 Rec. Adj. + 2025 to 2026 Forecast (A)	2023 to 2026 Imputed (B)	Difference	2023 to 2024 Rec. Adj. + 2025 to 2026 Forecast (A)	2023 to 2026 Imputed (B)	Difference
1	3	Capital	05	N/A	Tools & Equipment		No	No	N/A	N/A	No	This MWC is not related to safety, reliability, and/or maintenance.	N/A	N/A	N/A	$ 15,524	2,970	$ 12,555
2	3	Capital	11	N/A	Relicensing Hydro Gen		No	No	N/A	N/A	No	This MWC is not related to safety, reliability, and/or maintenance.	N/A	N/A	N/A	$ 3,804	9,646	$ (5,842)
3	3	Capital	12	N/A	Implement Environment Projects		No	No	N/A	N/A	No	This MWC is not related to safety, reliability, and/or maintenance.	N/A	N/A	N/A	$ 270	2,883	$ (2,613)
4	3	Capital	2L	N/A	Instl/Rpl for Hydro Safety&Reg		No	No	N/A	N/A	No	Work not unitized.	N/A	N/A	N/A	$ 212,066	154,109	$ 57,957
5	3	Capital	2M	N/A	Instal/Repl Hydro Gneratng Eqp		No	No	N/A	N/A	No	Work not unitized.	N/A	N/A	N/A	$ 558,187	424,595	$ 133,592
6	3	Capital	2N	N/A	Instal/Repl		No	No	N/A	N/A	No	Work not unitized.	N/A	N/A	N/A	$ 317,164	122,141	$ 195,023
7	3	Capital	2P	N/A	Instl/Repl Hydr BldgGrndInfrst		No	No	N/A	N/A	No	Work not unitized.	N/A	N/A	N/A	130,812	63,078	$ 67,733
8	3	Capital	3H	N/A	Hydroelectric Lic & Lic		No	No	N/A	N/A	No	Work not unitized.	N/A	N/A	N/A	215,605	460,075	$ (244,470)
9	3	Expense	AB	N/A	Misc Expense		No	No	N/A	N/A	No	This MWC is not related to safety, reliability, and/or maintenance.	N/A	N/A	N/A	15,503	32,623	$ (17,120)
10	3	Expense	AK	N/A	Manage Environmental Oper		No	No	N/A	N/A	No	This MWC is not related to safety, reliability, and/or maintenance.	N/A	N/A	N/A	3,831	4,985	$ (1,154)
11	3	Expense	AX	N/A	Maint Resv		No	No	N/A	N/A	No	Work not unitized.	N/A	N/A	N/A	122,718	125,055	$ (2,337)
12	3	Expense	AY	N/A	Habitat and Species Protection		No	No	N/A	N/A	No	This MWC is not related to safety, reliability, and/or maintenance.	N/A	N/A	N/A	680	1,140	$ (460)
13	3	Expense	BC	N/A	Perf Reimburs Wk for Oth		No	No	N/A	N/A	No	Work not unitized.	N/A	N/A	N/A	178	320	$ (142)
14	3	Expense	EP	N/A	Manage Property & Bldgs		No	No	N/A	N/A	No	This MWC is not related to safety, reliability, and/or maintenance.	N/A	N/A	N/A	7,824	5,326	$ 2,498
15	3	Expense	IG	N/A	Processes		No	No	N/A	N/A	No	Work not unitized.	N/A	N/A	N/A	121,379	107,765	$ 13,614
16	3	Expense	KG	N/A	Operate Hydro Generation		No	No	N/A	N/A	No	Work not unitized.	N/A	N/A	N/A	165,989	158,576	$ 7,413
17	3	Expense	KH	N/A	Maint Hydro Generating Equip		No	No	N/A	N/A	No	Work not unitized.	N/A	N/A	N/A	98,720	101,281	$ (2,561)
18	3	Expense	KI	N/A	Maint Hydro Bldg		No	No	N/A	N/A	No	Work not unitized.	N/A	N/A	N/A	50,716	63,017	$ (12,301)

Pacific Gas and Electric Company
2027 General Rate Case
Exhibit (PG&E-5), Chapter 3
Deferred Work Analysis Summary

The Hydro deferred work analysis follows the principles for determining if work was deferred set forth in PG&E's 2023 GRC Decision (D.23-11-069). Each MAT or MWC in this chapter was checked against those principles by following the checks listed below.

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								Check 2					Units Comparison			Dollar Comparison ($000s)		
Line	2027 GRC Chapter	Type	MWC	MAT CODE	Description	Unit of Measure	Check 1 (See Note 1)	*Check 2a*	*Check 2b*	Check 3	Deferred Work (Yes or No)	Explanation	2023 to 2024 Rec. Adj. + 2025 to 2026 Forecast (A)	2023 to 2026 Imputed (B)	Difference	2023 to 2024 Rec. Adj. + 2025 to 2026 Forecast (A)	2023 to 2026 Imputed (B)	Difference
19	3	Expense	KJ	N/A	License Compliance Hydro Gen		No	No	N/A	N/A	No	Work not unitized.	N/A	N/A	N/A	108,452	104,926	$ 3,526
20	3	Expense	OM	N/A	Operational Management		No	No	N/A	N/A	No	This MWC is not related to safety, reliability, and/or maintenance.	N/A	N/A	N/A	8,967	13,449	$ (4,482)
21	3	Expense	OS	N/A	Operational Support		No	No	N/A	N/A	No	This MWC is not related to safety, reliability, and/or maintenance.	N/A	N/A	N/A	47,726	17,210	$ 30,516
22	3	Expense	ZC	N/A	Corporate Items		No	No	N/A	N/A	No	This MWC is not related to safety, reliability, and/or maintenance.	N/A	N/A	N/A	0	6,471	$ (6,471)
23															Capital Total	1,453,431	1,239,497	$ 213,934
24															Expense Total	752,683	742,145	$ 10,538

25 Notes:

26 1. Although the Spending Accountability Report may include variance explanations for certain MWCs (rather than the more detailed MAT code level) since they include some safety and reliability-related work, in PG&E's 2023 GRC, not all work in those

27 MWCs were requested and authorized based on representations that it was needed to provide safe and reliable service.

Pacific Gas and Electric Company
2027 General Rate Case
Exhibit (PG&E-5), Chapter 3
Hydro Operations Costs
2019-2023 NERC GADS Generating Unit Statistical Brochure
Calculation of PG&E's Hydro Generation Reliability Metrics Industry Averages

Line	Equivalent Availability Factor	NERC GADS Data	2024 Capacity (MW)
1	Conventional Hydro	80.0%	2,627.6
2	Hydro Pumped Storage	77.6%	1,212.0
3	**Hydro Portfolio**	**79.3%**	3,839.6

	Forced Outage Factor	NERC GADS Data	2024 Capacity (MW)
4	Conventional Hydro	3.55%	2,627.6
5	Hydro Pumped Storage	4.97%	1,212.0
6	**Hydro Portfolio**	**4.00%**	3,839.6

Pacific Gas and Electric Company
2027 General Rate Case
Exhibit (PG&E-5), Chapter 3
Hydro Operations Costs
Industry Reliability Benchmark Data from NERC GADS

Pacific Gas and Electric Company

Line No.	Generator Catagory/Classification	Start	End	# Units	Unit-Years	NMC	NDC	Attempts	Actual	SH	RSH	# RSH	Pump Hr	SCH	AH
1	FOSSIL All Fuel Types All Sizes	2019	2023	1,037	4,141.58	345	344	30.48	30.12	4,269.82	2,292.46	13.93	0	0.45	6,562.73
2	FOSSIL All Fuel Types 001-099	2019	2023	209	826.75	52	52	33.56	33.42	3,495.14	2,507.10	17.48	0	0	6,002.24
3	FOSSIL All Fuel Types 100-199	2019	2023	220	778.92	135	134	76.75	76.4	3,446.20	2,960.30	18.82	0	0	6,406.50
4	FOSSIL All Fuel Types 200-299	2019	2023	117	472.58	231	230	15.36	15.04	4,823.31	2,081.51	12.02	0	0	6,904.82
5	FOSSIL All Fuel Types 300-399	2019	2023	97	396.67	340	340	22.28	21.8	3,910.19	2,737.73	18.99	0	0	6,647.91
6	FOSSIL All Fuel Types 400-599	2019	2023	189	799.83	482	481	15.58	15.15	4,834.86	1,920.40	11.07	0	2.35	6,757.62
7	FOSSIL All Fuel Types 600-799	2019	2023	126	553.83	663	661	11.79	11.33	5,229.92	1,569.58	7.06	0	0	6,799.50
8	FOSSIL All Fuel Types 800-999	2019	2023	67	257	829	828	12.06	11.59	4,838.54	2,224.34	9.07	0	0	7,062.88
9	FOSSIL All Fuel Types 1000 Plus	2019	2023	13	56	1,248	1,246	8.96	8.45	4,863.34	1,236.10	5	0	0	6,099.44
10	FOSSIL Coal Primary All Sizes	2019	2023	636	2,291.83	432	430	25.84	25.5	5,171.87	1,376.87	5.93	0	0.82	6,549.57
11	FOSSIL Coal Primary 001-099	2019	2023	82	213.75	57	57	10.4	10.33	3,695.39	2,016.98	6.62	0	0	5,712.37
12	FOSSIL Coal Primary 100-199	2019	2023	116	343.5	141	139	107.44	107.29	4,496.78	1,375.58	4.52	0	0	5,872.37
13	FOSSIL Coal Primary 200-299	2019	2023	76	292.25	229	228	11.03	10.74	5,250.89	1,470.24	5.71	0	0	6,721.14
14	FOSSIL Coal Primary 300-399	2019	2023	54	200.5	334	333	14.09	13.63	4,671.02	1,915.33	9.45	0	0	6,586.35
15	FOSSIL Coal Primary 400-599	2019	2023	129	525.42	488	486	12.17	11.81	5,780.50	1,100.74	6	0	3.58	6,884.83
16	FOSSIL Coal Primary 600-799	2019	2023	113	476.5	663	661	11.37	10.96	5,739.36	1,107.71	5.63	0	0	6,847.07
17	FOSSIL Coal Primary 800-999	2019	2023	55	188.92	835	834	9.25	8.74	5,324.39	1,565.42	5.31	0	0	6,889.81
18	FOSSIL Coal Primary 1000 Plus	2019	2023	12	51	1,275	1,272	9.24	8.71	5,285.98	712.11	4.14	0	0	5,998.09
19	FOSSIL Oil Primary All Sizes	2019	2023	63	204.08	316	315	22.43	22.23	1,902.37	4,553.30	23.3	0	0	6,455.67
20	FOSSIL Oil Primary 001-099	2019	2023	15	66.58	68	68	49.16	48.89	3,672.54	1,494.95	46.56	0	0	5,167.49
21	FOSSIL Oil Primary 100-199	2019	2023	9	29	123	123	5.59	5.52	2,620.60	4,728.06	7.62	0	0	7,348.66
22	FOSSIL Oil Primary 200-299	2019	2023	*	*	*	*	*	*	*	*	*	*	*	*
23	FOSSIL Oil Primary 300-399	2019	2023	12	40.42	364	363	13.83	13.61	1,316.57	5,142.55	13.41	0	0	6,459.12
24	FOSSIL Oil Primary 400-599	2019	2023	11	29.92	463	461	8.79	8.76	166.48	7,240.90	13.24	0	0	7,407.37
25	FOSSIL Oil Primary 600-799	2019	2023	7	19.42	608	604	12.1	12	284.29	7,078.28	16.12	0	0	7,362.57
26	FOSSIL Oil Primary 800-999	2019	2023	7	13.67	812	809	3.73	3.29	79.28	7,120.38	8.05	0	0	7,199.66
27	FOSSIL Oil Primary 1000 Plus	2019	2023	*	*	*	*	*	*	*	*	*	*	*	*
28	FOSSIL Gas Primary All Sizes	2019	2023	330	1,297.00	240	240	37.91	37.43	2,518.67	3,915.50	26.18	0	0	6,434.17
29	FOSSIL Gas Primary 001-099	2019	2023	83	318.33	53	53	35.05	34.85	1,539.65	4,037.23	18.44	0	0	5,576.88
30	FOSSIL Gas Primary 100-199	2019	2023	101	394.08	131	131	57.45	56.92	2,471.71	4,284.22	32.57	0	0	6,755.93
31	FOSSIL Gas Primary 200-299	2019	2023	43	150.17	235	235	23.01	22.67	3,580.79	3,616.87	24.13	0	0	7,197.66
32	FOSSIL Gas Primary 300-399	2019	2023	35	142.5	343	342	32.69	32.08	3,489.40	3,330.75	30.63	0	0	6,820.16
33	FOSSIL Gas Primary 400-599	2019	2023	51	212.67	478	478	25.18	24.53	2,829.70	3,442.12	24.38	0	0	6,271.82
34	FOSSIL Gas Primary 600-799	2019	2023	10	49.5	683	682	15.74	14.67	2,460.31	3,655.91	17.52	0	0	6,116.22
35	FOSSIL Gas Primary 800-999	2019	2023	7	29.75	796	796	37.71	37.21	1,479.17	5,852.83	40.61	0	0	7,332.00
36	FOSSIL Gas Primary 1000 Plus	2019	2023	*	*	*	*	*	*	*	*	*	*	*	*
37	FOSSIL Oil/Gas Primary All Sizes	2019	2023	384	1,501.08	251	250	35.81	35.37	2,434.88	4,002.22	25.79	0	0	6,437.09
38	FOSSIL Oil/Gas Primary 001-099	2019	2023	98	384.92	56	55	37.49	37.28	1,908.60	3,597.46	23.31	0	0	5,506.06
39	FOSSIL Oil/Gas Primary 100-199	2019	2023	109	423.08	130	130	53.9	53.39	2,481.92	4,314.65	30.86	0	0	6,796.56
40	FOSSIL Oil/Gas Primary 200-299	2019	2023	43	150.25	235	235	23.02	22.68	3,579.85	3,618.06	24.15	0	0	7,197.91
41	FOSSIL Oil/Gas Primary 300-399	2019	2023	44	182.92	348	347	28.53	28	3,009.30	3,731.08	26.83	0	0	6,740.38
42	FOSSIL Oil/Gas Primary 400-599	2019	2023	62	242.58	476	476	23.16	22.58	2,501.26	3,910.60	23.01	0	0	6,411.86
43	FOSSIL Oil/Gas Primary 600-799	2019	2023	15	68.92	661	660	14.71	13.92	1,847.24	4,620.13	17.12	0	0	6,467.37
44	FOSSIL Oil/Gas Primary 800-999	2019	2023	12	43.42	801	800	27.02	26.53	1,038.51	6,251.83	30.36	0	0	7,290.34
45	FOSSIL Oil/Gas Primary 1000 Plus	2019	2023	*	*	*	*	*	*	*	*	*	*	*	*
46	FOSSIL Lignite Primary All Sizes	2019	2023	18	77.75	522	520	10.95	10.59	7,174.73	339.43	2.7	0	0	7,514.16
47	NUCLEAR All Types All Sizes	2019	2023	104	457.42	1,030	1,026	1.53	1.5	8,081.90	0.6	0.01	0	0	8,082.50
48	NUCLEAR All Types 400-799	2019	2023	11	43	624	619	1.26	1.26	7,924.60	0	0	0	0	7,924.60
49	NUCLEAR All Types 800-999	2019	2023	37	161	892	889	1.51	1.48	8,156.15	0	0	0	0	8,156.15
50	NUCLEAR All Types 1000 Plus	2019	2023	56	253.42	1,187	1,181	1.58	1.55	8,061.42	1.08	0.01	0	0	8,062.50
51	NUCLEAR PWR All Sizes	2019	2023	61	271	1,046	1,041	1.48	1.44	8,037.65	0.86	0	0	0	8,038.51
52	NUCLEAR PWR 400-799	2019	2023	4	17	616	609	1.24	1.24	8,084.16	0	0	0	0	8,084.16
53	NUCLEAR PWR 800-999	2019	2023	22	91	890	888	1.41	1.35	8,135.89	0	0	0	0	8,135.89
54	NUCLEAR PWR 1000 Plus	2019	2023	35	163	1,178	1,172	1.54	1.5	7,977.96	1.43	0.01	0	0	7,979.39
55	NUCLEAR BWR All Sizes	2019	2023	30	136	1,061	1,057	1.64	1.63	8,243.83	0.3	0.01	0	0	8,244.14
56	NUCLEAR BWR 400-799	2019	2023	*	*	*	*	*	*	*	*	*	*	*	*
57	NUCLEAR BWR 800-999	2019	2023	9	45	891	886	1.76	1.76	8,314.43	0	0	0	0	8,314.43
58	NUCLEAR BWR 1000 Plus	2019	2023	18	82	1,201	1,197	1.65	1.63	8,246.69	0.5	0.02	0	0	8,247.20
59	NUCLEAR CANDU All Sizes	2019	2023	*	*	*	*	*	*	*	*	*	*	*	*
60	JET ENGINE All Sizes	2019	2023	204	909.42	41	39	85.01	84.13	435.16	7,224.22	88.93	0	82.38	7,741.76
61	JET ENGINE 001-019	2019	2023	22	98	14	14	12.94	12.64	99.24	8,044.62	19.58	0	0	8,143.86
62	JET ENGINE 20 Plus	2019	2023	182	811.42	44	42	93.72	92.77	475.73	7,125.13	97.31	0	92.33	7,693.19
63	GAS TURBINE All Sizes	2019	2023	592	2,662.75	69	67	58.04	57.29	467.46	7,133.36	58.86	0	0	7,600.82
64	GAS TURBINE 001-019	2019	2023	83	328.75	15	15	27.68	26.38	106.05	7,074.93	32.75	0	0	7,180.98
65	GAS TURBINE 020-049	2019	2023	117	514.58	30	29	77.4	76.78	425.78	7,034.91	65.03	0	0	7,460.69
66	GAS TURBINE 50 Plus	2019	2023	392	1,819.42	89	86	58.05	57.36	544.55	7,171.76	61.83	0	0	7,716.31
67	COMBINED CYCLE All Sizes	2019	2023	346	1,469.67	319	312	60.14	59.55	4,978.54	2,526.23	54.16	0	0.09	7,504.86
68	HYDRO All Sizes	2019	2023	905	4,332.92	66	66	116.16	116.06	5,165.21	1,528.80	40.82	6.58	157.76	6,858.35
69	HYDRO 001-029	2019	2023	335	1,610.92	11	11	32	31.94	5,024.49	1,137.02	14.52	13.56	115.38	6,290.45
70	HYDRO 30 Plus	2019	2023	570	2,722.00	99	99	165.97	165.85	5,248.49	1,760.67	56.39	2.45	182.84	7,194.45
71	PUMPED STORAGE All Sizes	2019	2023	111	533	130	129	232.1	231.98	2,279.67	3,559.91	201	990.87	247.43	7,077.88
72	MULTIBOILER/MULTI-TURBINE All Sizes	2019	2023	21	89	322	319	13.63	13.26	3,975.24	2,630.62	12.2	0	0	6,605.85
73	GEOTHERMAL All Sizes	2019	2023	48	210.42	35	33	6.58	6.34	7,693.02	4.24	0.06	0	0	7,697.26
74	DIESEL All Sizes	2019	2023	215	822.58	11	11	184.18	182.94	1,628.45	6,318.61	156.4	0	0	7,947.06
75															
76															
77	* - indicates 3 or fewer units in results														

Line No.	FOH	# FOH	POH	# POH	SEPO	# SEPO	MOH	# MOH	SEMO	# SEMO	UAH	PH	EFDH	ESDH	EFDHRS	EDOH	POF	MOF	ART
1	506.98	5.57	736.39	1.34	38.86	0.13	325.79	2.54	6.61	0.05	1,614.64	8,177.37	173.97	47.35	41.4	221.32	9.48	4.06	141.76
2	633.79	4.76	563.45	1.09	31.11	0.07	271.91	1.58	0.9	0.01	1,501.16	7,503.41	131.79	54.45	32.72	186.25	7.92	3.64	104.58
3	486.91	4.5	707.54	1.29	21.55	0.09	275.68	1.96	2.05	0.04	1,493.72	7,900.23	155.64	42.86	48.63	198.49	9.23	3.52	45.11
4	378.66	5.6	702.57	1.41	20.2	0.11	349.06	3.27	14.28	0.11	1,464.77	8,369.59	173.06	49.45	39.49	222.5	8.64	4.34	320.7
5	440.37	5.99	904.09	1.68	59.22	0.17	357.72	3.2	16.23	0.07	1,777.63	8,425.55	196.02	47.77	49.38	243.79	11.43	4.44	179.37
6	506.74	6.65	791.2	1.52	66.99	0.19	352.1	3	3.3	0.04	1,720.33	8,477.94	200.76	47.78	41.95	248.54	10.12	4.19	319.13
7	534.35	6.63	814.66	1.3	40.04	0.15	349.09	2.83	13.14	0.07	1,751.29	8,550.78	206.05	43.25	44.48	249.29	10	4.24	461.6
8	423.31	5.14	744.72	1.21	31.33	0.18	331.32	2.73	7.49	0.04	1,538.16	8,601.04	165.87	31.97	35.02	197.84	9.02	3.94	417.48
9	585.47	5.46	1,193.33	1.25	28.58	0.2	764.41	3.59	0.47	0.02	2,572.25	8,671.70	240.17	89.46	19.67	329.63	14.09	8.82	575.54
10	489.27	6.07	697.86	1.18	33.73	0.13	320.45	2.64	7.8	0.07	1,549.11	8,098.68	170.72	51.21	18.72	221.93	9.03	4.05	202.82
11	335.4	5.11	562.68	0.87	22.57	0.07	159.08	1.39	1.25	0.01	1,080.98	6,793.34	65.51	61.37	8.86	126.89	8.62	2.36	357.73
12	523.2	4.68	577.54	1.05	15.23	0.11	208.29	1.45	2.31	0.04	1,326.57	7,198.94	155.15	55.65	12.93	210.8	8.23	2.93	41.91
13	412.19	6.19	624.77	1.33	21.11	0.12	415.15	3.67	23.08	0.18	1,496.30	8,217.43	168.4	62.43	21.96	230.83	7.86	5.33	488.91
14	549.37	6.8	770.8	1.21	33.44	0.15	403.07	3.23	16.84	0.11	1,773.51	8,359.86	253.64	64.14	38.73	317.78	9.62	5.02	342.7
15	490.47	6.71	715.4	1.28	60.31	0.17	301.67	2.76	2.72	0.04	1,570.58	8,455.41	178.27	43.03	14.99	221.3	9.17	3.6	489.46
16	539.95	6.76	749.63	1.17	32.02	0.12	342.11	2.84	8.21	0.06	1,671.92	8,518.98	183.56	44.66	18.44	228.22	9.18	4.11	523.66
17	486.53	5.29	763.78	1.15	30.88	0.15	368.25	2.93	7	0.04	1,656.43	8,546.24	157.68	28.13	26.58	185.81	9.3	4.39	609.2
18	635.06	5.75	1,298.55	1.35	31.38	0.22	698.97	3.65	0.52	0.02	2,664.48	8,662.57	254.35	94.4	13.56	348.75	15.35	8.07	606.89
19	509.9	3	632.01	1.24	23.12	0.11	388.09	1.64	6.99	0.01	1,560.11	8,015.78	254.43	15.4	83.44	269.83	8.17	4.93	85.58
20	954.49	3.72	293.63	0.26	0	0	501.8	1.52	0	0	1,749.93	6,917.42	561.52	17.2	149.66	578.73	4.24	7.25	75.12
21	601.76	1.97	451.87	1.14	0	0	311.33	1.24	0	0	1,364.96	8,713.62	240.26	6.63	19.88	246.89	5.19	3.57	474.75
22	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
23	255.6	2.92	1,007.62	2.23	8.06	0.05	368.03	1.95	0	0	1,639.32	8,098.44	23.99	14.11	4.83	38.09	12.54	4.54	96.74
24	182.21	2.64	929.13	2.04	57.91	0.27	188.52	1.94	0	0	1,357.77	8,765.15	24.62	34.47	22.36	59.09	11.26	2.15	19
25	300.85	3.61	719.71	1.49	49.41	0.26	221.72	0.93	73.5	0.15	1,365.19	8,727.76	105.06	0.47	98.89	105.53	8.81	3.38	23.69
26	75.8	1.98	968.17	1.68	124.4	0.51	342.14	1.98	0	0	1,510.51	8,710.17	244.79	0	240.86	244.79	12.54	3.93	24.1
27	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
28	560.06	4.75	840.55	1.6	51.05	0.12	368.47	2.66	6.14	0.03	1,826.27	8,260.43	164.85	29.88	84.37	194.74	10.79	4.53	67.29
29	883.14	3.14	570.13	1.1	42.84	0.04	380.5	1.41	1.34	0.01	1,877.95	7,454.83	73.42	3.05	45.42	76.47	8.22	5.12	44.18
30	456.65	4.63	849.84	1.55	29.31	0.08	330.84	2.44	2.03	0.04	1,668.67	8,424.60	152.45	29.73	83.39	182.18	10.44	3.95	43.42
31	303.54	4.03	817.38	1.41	19.2	0.11	248.37	2.74	0	0	1,388.49	8,586.15	180.28	26.66	78.54	206.94	9.74	2.89	157.95
32	374.16	5.98	1,079.15	2.21	102.52	0.22	300.26	3.6	21.5	0.03	1,877.60	8,697.75	179.43	36.95	79.9	216.37	13.59	3.7	108.77
33	598.5	6.74	963.76	2.02	83.9	0.19	527.32	3.95	5.28	0.04	2,178.75	8,450.57	259.11	64.41	117.5	323.52	12.4	6.3	115.36
34	557.05	6.3	1,447.38	2.36	114.9	0.42	493.26	3.6	39.18	0.14	2,651.78	8,768.00	422.8	48.62	267.6	471.41	17.82	6.07	167.71
35	388.13	4.57	694.84	1.51	0	0	328.16	3.26	20.3	0.07	1,431.43	8,763.43	56.89	23.46	23.1	80.35	7.93	3.98	39.75
36	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
37	553.24	4.51	812.2	1.55	47.25	0.12	371.14	2.52	6.25	0.03	1,790.08	8,227.17	177.03	27.91	84.24	204.95	10.45	4.59	68.84
38	895.48	3.24	522.3	0.95	35.43	0.04	401.49	1.43	1.11	0.01	1,855.80	7,361.87	157.85	5.5	63.45	163.35	7.58	5.47	51.2
39	466.6	4.45	822.56	1.52	27.3	0.08	329.5	2.36	1.89	0.04	1,647.85	8,444.41	158.47	28.14	79.04	186.61	10.06	3.92	46.49
40	303.37	4.03	816.93	1.4	19.18	0.11	248.95	2.74	0	0	1,388.43	8,586.34	180.18	26.64	78.5	206.82	9.74	2.9	157.84
41	347.96	5.3	1,063.35	2.21	81.65	0.18	315.24	3.24	16.75	0.02	1,824.95	8,565.33	145.08	31.9	63.32	176.98	13.37	3.88	107.48
42	547.16	6.23	959.49	2.02	80.69	0.2	485.53	3.7	4.63	0.03	2,077.50	8,489.36	230.19	60.72	105.77	290.91	12.25	5.77	110.77
43	484.87	5.54	1,242.37	2.12	96.45	0.38	416.76	2.84	48.85	0.15	2,289.30	8,756.66	333.28	35.05	220.06	368.33	15.29	5.32	132.7
44	289.82	3.75	780.88	1.57	39.16	0.16	332.56	2.86	13.91	0.05	1,456.32	8,746.66	116.04	16.08	91.65	132.11	9.38	3.96	39.14
45	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
46	382.64	7.38	591.62	1.23	36.46	0.26	143	1.67	1.45	0.05	1,155.17	8,669.33	308.11	47.75	1.25	355.85	7.24	1.67	677.5
47	127.8	0.78	458.37	0.89	17.57	0.1	21.14	0.15	0.27	0	625.14	8,707.64	39.68	81.42	0	121.1	5.47	0.25	5,387.93
48	211.62	0.74	431.53	0.77	5.69	0.05	38.47	0.12	0	0	687.31	8,611.91	34.94	77.8	0	112.74	5.08	0.45	6,289.37
49	102.1	0.81	409.41	0.8	29.68	0.11	19.96	0.12	0	0	561.14	8,717.29	37.86	68.97	0	106.83	5.04	0.23	5,510.91
50	129.9	0.77	494.02	0.96	11.89	0.09	18.95	0.17	0.49	0	655.25	8,717.75	41.63	89.95	0	131.58	5.8	0.22	5,200.92
51	139.16	0.78	505.75	0.88	18.17	0.1	10.09	0.08	0	0	673.17	8,711.68	29.9	53.53	0	83.43	6.01	0.12	5,581.70
52	236.82	0.88	444.2	0.71	0	0	0.46	0.06	0	0	681.49	8,765.65	24.05	81.07	0	105.12	5.07	0.01	6,519.48
53	112.14	0.76	457.04	0.8	27.98	0.09	3.87	0.04	0	0	601.03	8,736.92	27.4	40.39	0	67.79	5.55	0.04	6,026.59
54	144.06	0.79	539.36	0.94	14.58	0.12	14.57	0.1	0	0	712.57	8,691.96	31.9	58	0	89.9	6.37	0.17	5,318.64
55	101.37	0.74	342.66	0.87	7.92	0.06	29.61	0.28	0.91	0.01	482.46	8,726.60	48.96	134.18	0	183.13	4.02	0.35	5,057.56
56	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
57	97.13	0.84	302.7	0.8	12.56	0.09	37.98	0.27	0	0	450.37	8,764.80	45.08	105.58	0	150.66	3.6	0.43	4,724.11
58	109.12	0.73	375.69	0.94	3.26	0.02	27.32	0.3	1.5	0.01	516.9	8,764.10	50.69	148.77	0	199.47	4.32	0.33	5,059.32
59	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
60	292.51	5.44	406.79	2.61	15.26	0.05	222.87	3.99	4.65	0.04	942.07	8,683.83	57.89	30.19	54.44	88.08	4.86	2.62	5.17
61	181.15	2.71	191	1.11	0	0	246.31	3.44	2.58	0.01	621.03	8,764.90	2.9	0.44	2.7	3.33	2.18	2.84	7.85
62	305.96	5.77	432.85	2.79	17.1	0.06	220.03	4.06	4.9	0.04	980.84	8,674.03	64.53	33.78	60.68	98.31	5.19	2.59	5.13
63	384.8	4.16	416.57	1.8	17.78	0.04	188.94	2.8	12.56	0.02	1,020.64	8,621.46	33.83	6.23	30.39	40.07	5.04	2.34	8.16
64	503.6	3.47	255.03	0.78	28.34	0.07	194.96	2.46	41.22	0.06	1,023.15	8,204.13	5.18	5.11	5.01	10.29	3.45	2.88	4.02
65	568.48	4.38	310.22	1.73	13.73	0.03	194.93	3.57	3.06	0.01	1,090.43	8,551.12	18.76	0.5	17.19	19.26	3.79	2.32	5.55
66	311.38	4.22	475.84	2	17.01	0.04	186.16	2.64	10.06	0.02	1,000.45	8,716.77	43.28	8.06	38.71	51.34	5.65	2.25	9.49
67	271.83	5.35	690.37	2.42	30.78	0.17	166.58	2.11	1.63	0.03	1,161.21	8,666.07	47.55	50.64	14.79	98.19	8.32	1.94	83.6
68	621.75	3.4	988.62	2.78	23.9	0.03	163.93	2.33	12.17	0.01	1,810.37	8,668.72	9.48	11.44	2.05	20.92	11.68	2.03	44.5
69	1,111.47	5.22	851.07	1.75	17.56	0.04	231.41	2.18	4.11	0.01	2,215.60	8,506.05	13.36	7.67	0.07	21.03	10.21	2.77	157.31
70	331.93	2.32	1,070.03	3.39	27.65	0.02	123.99	2.42	16.94	0.01	1,570.54	8,764.99	7.19	13.66	3.22	20.86	12.52	1.61	31.65
71	445.79	2.65	989.92	2.56	33.11	0.13	217.35	4.79	0.54	0.01	1,686.71	8,764.59	10.88	1.36	5.28	12.24	11.67	2.49	9.83
72	603.99	4.09	834.53	1.58	29.62	0.11	454.89	2.84	6.18	0.02	1,929.20	8,535.06	402.13	158.5	56.74	560.63	10.12	5.4	299.79
73	380.09	4.68	59.6	0.45	13.75	0.03	147.96	1.75	4.25	0.02	605.65	8,302.91	44.92	17.25	1.71	62.18	0.88	1.83	1,213.41
74	301.62	9.24	261.37	1.67	1.39	0.01	130.25	3.91	1.36	0.01	696	8,643.06	30.33	18	20.15	48.33	3.04	1.52	8.9

Line No.	SR	NCF	NOF	SF	AF	EAF	FOR	EFOR	EFORd	SOF	FOF	UOF	EUOF	EUOR	WSF	WAF	WEAF	WFOR	WEFOR	WSOF	WFOF
1	98.82	37.23	66.42	52.2	80.25	77.16	10.61	14.13	10.85	13.55	6.2	10.26	12.6	20	56.1	79.82	76.78	9.34	12.89	14.41	5.78
2	99.58	30.08	63.02	46.6	79.99	76.67	15.35	18.4	13.02	11.56	8.45	12.08	14	23.72	47.7	80.44	77.19	14.6	17.99	11.4	8.16
3	99.54	26.22	59.18	43.6	81.09	78.13	12.38	16.14	10.21	12.74	6.16	9.68	11.9	21.94	44.3	80.77	77.8	12.4	16.15	12.96	6.27
4	97.92	36.07	62.75	57.6	82.5	79.46	7.28	10.53	8.79	12.98	4.52	8.87	11.2	16.68	57.5	82.73	79.75	7.2	10.43	12.81	4.46
5	97.85	25.41	55.17	46.4	78.9	75.82	10.12	14.46	10.93	15.87	5.23	9.66	12.3	21.61	46.1	78.84	75.84	10.17	14.45	15.94	5.21
6	97.24	37.28	65.18	57	79.71	76.58	9.48	13.14	11.09	14.31	5.98	10.17	12.7	18.71	57.2	79.8	76.7	9.27	12.88	14.35	5.85
7	96.1	44.41	72.22	61.2	79.52	76.31	9.27	12.75	11.21	14.23	6.25	10.49	13.2	18.23	61.5	79.48	76.28	9.23	12.68	14.27	6.26
8	96.1	38.4	67.87	56.3	82.12	79.78	8.04	11.12	9.33	12.96	4.92	8.86	11.1	16.92	56.6	82.27	79.95	7.84	10.88	12.92	4.81
9	94.31	38.99	68.27	56.1	70.34	66.37	10.74	15.1	13.38	22.91	6.75	15.57	18.8	26.09	57.1	70.01	65.98	10.82	15.2	23.07	6.93
10	98.68	45.45	69.84	63.9	80.87	77.69	8.64	11.62	9.96	13.09	6.04	10.09	12.5	16.77	65.1	80.08	77.05	8.54	11.56	13.85	6.08
11	99.33	39.65	72.05	54.4	84.09	81.07	8.32	9.92	8.45	10.98	4.94	7.3	8.6	13.91	55	85.17	82.25	7.92	9.87	10.09	4.73
12	99.86	41.49	67.04	62.5	81.57	77.66	10.42	13.48	10.79	11.16	7.27	10.19	12.5	17.12	61.9	80.99	77.22	11	14.05	11.37	7.65
13	97.37	43.76	68.73	63.9	81.79	78.47	7.28	10.21	9.05	13.19	5.02	10.35	12.6	16.95	63.7	82.15	78.85	7.33	10.29	12.81	5.04
14	96.74	36.66	65.57	55.9	78.79	74.74	10.52	15.27	12.79	14.64	6.57	11.59	15	22.01	55.9	78.74	74.73	10.64	15.35	14.61	6.66
15	97.04	46.81	68.32	68.4	81.43	78.57	7.82	10.63	9.67	12.77	5.8	9.4	11.7	14.97	68.5	81.51	78.64	7.62	10.42	12.83	5.66
16	96.39	49.54	73.5	67.4	80.37	77.38	8.6	11.49	10.45	13.29	6.34	10.45	12.9	16.54	67.4	80.38	77.41	8.6	11.47	13.28	6.34
17	94.49	42.29	67.81	62.3	80.62	78.41	8.37	11.04	9.8	13.69	5.69	10.08	12.2	16.79	62.4	80.9	78.72	8.13	10.77	13.58	5.52
18	94.26	41.82	68.58	61	69.24	65.04	10.73	14.99	13.87	23.43	7.33	15.41	18.8	24.51	61	69.14	64.92	10.8	15.12	23.47	7.39
19	99.11	4.87	44.9	23.7	80.54	77.06	21.14	30.63	14.9	13.1	6.36	11.29	14.6	40.37	10.8	82.38	80.36	21.86	31.47	14.59	3.03
20	99.45	31.43	51.63	53.1	74.7	66.34	20.63	31.74	25.15	11.5	13.8	21.05	29.4	38.47	60.9	76.41	67.54	15.52	26.81	12.41	11.18
21	98.75	20.14	59.02	30.1	84.34	81.5	18.67	25.97	16.32	8.76	6.91	10.48	13.3	32.59	34.1	84.47	81.25	15.74	23.35	9.16	6.37
22	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
23	98.41	5.62	34.48	16.3	79.76	79.27	16.26	17.73	10.41	17.09	3.16	7.7	8.1	33.74	16.3	80.08	79.6	15.66	17.15	16.89	3.03
24	99.66	0.7	37.17	1.9	84.51	83.55	52.26	55.74	20.36	13.41	2.08	4.23	4.74	69.28	1.89	84.31	83.35	53.44	56.85	13.52	2.17
25	99.17	1.36	41.72	3.26	84.36	82.74	51.42	59.34	21.7	12.19	3.45	6.83	8.04	71.58	3.26	84.18	82.45	50.88	59.46	12.45	3.37
26	88.2	0.27	29.44	0.91	82.66	79.53	48.88	80.97	29.63	16.47	0.87	4.8	7.61	89.79	0.91	82.67	79.6	48.39	80.63	16.49	0.85
27	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
28	98.73	14.2	43.31	30.5	77.89	75.34	18.19	22.92	13.18	15.33	6.78	11.32	13.5	31.36	32.8	77.28	74.23	14.97	20.7	16.95	5.77
29	99.43	11.28	44.11	20.7	74.81	73.18	36.45	38.76	17.85	13.34	11.9	16.97	18	47.02	25.6	76.09	74.28	30.56	33.04	12.65	11.26
30	99.08	13.95	47.01	29.3	80.19	77.96	15.59	20.22	10.61	14.39	5.42	9.37	11.5	28.63	29.7	80.09	77.76	15.14	19.83	14.62	5.29
31	98.52	18.21	43.27	41.7	83.83	81.38	7.81	12.21	8.38	12.64	3.54	6.43	8.8	17.88	42.1	83.8	81.47	7.37	11.56	12.85	3.35
32	98.13	15.27	38.04	40.1	78.41	75.76	9.68	14.04	9.76	17.29	4.3	8	10.3	20.95	40.1	78.3	75.73	9.58	13.8	17.44	4.25
33	97.42	14.75	44.39	33.5	74.22	70.33	17.46	24.19	16.21	18.7	7.08	13.38	16.5	34.18	33.2	74.37	70.55	17.22	23.94	18.72	6.91
34	93.2	14.89	49.1	28.1	69.76	64.28	18.46	29.83	20.02	23.89	6.35	12.43	17.3	39.62	30.3	69.8	64.39	17.27	28.04	23.86	6.33
35	98.67	5.17	30.92	16.9	83.67	82.75	20.79	23.54	10.62	11.91	4.43	8.41	9.29	35.84	16.7	83.29	82.38	21.19	23.86	12.21	4.49
36	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
37	98.77	12.61	43.41	29.6	78.24	75.57	18.51	23.77	13.39	15.03	6.72	11.31	13.6	32.38	29	78.15	75.27	15.44	21.47	16.54	5.3
38	99.44	15.41	46.97	25.9	74.79	72.06	31.93	36.73	18.81	13.04	12.2	17.63	19.8	44.64	32.8	76.15	72.9	25.52	30.94	12.6	11.24
39	99.05	14.36	47.92	29.4	80.49	78.21	15.82	20.65	10.81	13.99	5.53	9.45	11.6	28.92	30	80.38	77.99	15.18	20.09	14.26	5.36
40	98.52	18.21	43.27	41.7	83.83	81.39	7.81	12.21	8.37	12.64	3.53	6.43	8.8	17.89	42.1	83.8	81.48	7.37	11.56	12.85	3.35
41	98.14	13.17	37.68	35.1	78.69	76.49	10.36	14.41	9.58	17.24	4.06	7.94	9.85	22.41	34.9	78.69	76.58	10.24	14.16	17.32	3.99
42	97.5	13.02	44.34	29.5	75.53	72.01	17.95	24.64	15.7	18.03	6.45	12.22	15	34.89	29.4	75.59	72.13	17.73	24.41	18.08	6.33
43	94.63	11.4	48.84	21.1	73.86	69.46	20.79	32.06	19.15	20.61	5.54	10.85	14.7	42.55	23.3	73.51	69.05	19.26	30.08	20.92	5.57
44	98.19	3.61	30.89	11.9	83.35	81.74	21.82	28.58	11.56	13.34	3.31	7.27	8.77	42.85	11.7	83.09	81.5	22.2	28.86	13.57	3.34
45	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
46	96.71	63.78	76.76	82.8	86.68	81.56	5.06	9.14	8.83	8.91	4.41	6.08	9.95	11.19	83.1	87.32	82.65	4.59	8.94	8.69	3.99
47	98.04	91.96	99.16	92.8	92.82	91.01	1.56	2.04	2.04	5.71	1.47	1.71	2.59	2.74	92.7	92.75	90.92	1.56	2.06	5.78	1.47
48	100	90.04	97.91	92	92.02	89.8	2.6	3.03	3.03	5.52	2.46	2.9	3.48	3.67	92	91.96	89.8	2.68	3.12	5.51	2.53
49	98.01	93.23	99.72	93.6	93.56	92.06	1.24	1.69	1.69	5.27	1.17	1.4	2.2	2.32	93.5	93.49	91.99	1.27	1.73	5.31	1.2
50	98.1	91.52	98.99	92.5	92.48	90.54	1.59	2.09	2.09	6.03	1.49	1.71	2.68	2.85	92.5	92.46	90.51	1.6	2.12	6.03	1.51
51	97.3	91.82	99.62	92.3	92.27	90.91	1.7	2.07	2.07	6.13	1.6	1.71	2.28	2.43	92.2	92.18	90.81	1.7	2.07	6.22	1.59
52	100	92.15	99.85	92.2	92.23	89.99	2.85	3.14	3.14	5.07	2.7	2.71	3.1	3.26	92.3	92.29	90.21	2.93	3.24	4.93	2.78
53	95.74	93.33	100.3	93.1	93.12	92.18	1.36	1.69	1.69	5.6	1.28	1.33	1.78	1.89	93.1	93.06	92.11	1.4	1.73	5.62	1.32
54	97.4	91.16	99.32	91.8	91.8	90.29	1.77	2.17	2.17	6.54	1.66	1.83	2.48	2.65	91.8	91.81	90.3	1.76	2.15	6.55	1.65
55	99.39	93.33	98.96	94.5	94.47	91.97	1.21	1.8	1.8	4.37	1.16	1.51	2.89	3.01	94.3	94.31	91.81	1.3	1.9	4.45	1.24
56	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
57	100	94.83	99.98	94.9	94.86	92.63	1.15	1.69	1.69	4.03	1.11	1.54	2.74	2.85	94.8	94.84	92.66	1.17	1.72	4.03	1.13
58	98.79	92.81	98.74	94.1	94.1	91.54	1.31	1.91	1.91	4.65	1.25	1.57	3.06	3.2	94	94	91.43	1.39	2.01	4.68	1.32
59	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
60	98.96	5.62	82.16	5.01	89.15	85.79	36.11	40.53	9.04	7.48	3.37	5.99	6.82	53.06	6.85	88.6	83.92	31.65	36.76	7.75	3.65
61	97.68	0.14	13.43	1.13	92.91	92.78	64.61	65.01	17.44	5.02	2.07	4.91	4.94	81.42	1.08	92.6	92.5	68.12	68.49	5.1	2.31
62	98.99	5.84	82.57	5.48	88.69	84.93	35.01	39.64	9.09	7.78	3.53	6.12	7.05	51.52	7.07	88.44	83.58	31.24	36.43	7.86	3.7
63	98.71	4.86	68.99	5.42	88.16	85.1	45.15	47.43	10.32	7.38	4.46	6.8	7.23	57.19	7.04	88.91	85.43	32.45	35.22	7.71	3.38
64	95.3	0.66	51.47	1.29	87.53	86.41	82.6	82.77	16.56	6.33	6.14	9.02	9.09	87.5	1.28	87.88	86.72	82.35	82.52	6.15	5.97
65	99.2	5.22	78.91	4.98	87.25	84.34	57.18	58.06	11.37	6.1	6.65	8.96	9.19	64.94	6.62	87.66	84.75	45.97	47.01	6.71	5.63
66	98.81	4.95	68.22	6.25	88.52	85.08	36.38	39.64	9.39	7.91	3.57	5.82	6.37	50.53	7.25	89.06	85.46	29.89	32.97	7.85	3.09
67	99.02	56.31	81.95	57.5	86.6	83.38	5.18	6.07	4.71	10.26	3.14	5.08	5.85	9.31	68.7	87.45	83.95	3	4.01	10.42	2.13
68	99.91	32.85	55.34	59.6	79.12	78.58	10.45	10.6	8.75	13.71	7.17	9.2	9.32	13.18	59.4	80.47	80.01	5.48	5.6	15.98	3.55
69	99.81	31.96	51.35	59.1	73.95	73.59	17.74	17.95	15.82	12.98	13.1	15.84	16	20.93	62.3	78.31	77.97	11.99	12.32	12.91	8.78
70	99.93	32.91	55.63	59.9	82.08	81.44	5.76	5.88	4.69	14.13	3.79	5.39	5.48	8.13	59.2	80.62	80.15	4.97	5.07	16.19	3.19
71	99.95	7.83	48.99	26	80.76	80.44	11.25	11.51	7.59	14.16	5.09	7.57	7.7	16.12	16	78.31	77.61	13.44	13.87	16.73	4.97
72	97.29	19.89	54.48	46.6	77.4	69.78	13.19	21.7	16.06	15.53	7.08	12.48	18	29.82	36.5	76.39	70.39	7.53	17.12	20.64	2.97
73	96.35	72.85	78.83	92.7	92.71	87.74	4.71	5.26	5.26	2.72	4.58	6.41	7.05	7.12	92.4	92.42	88.45	4.7	5.13	3.02	4.56
74	99.33	17.71	65.45	18.8	91.95	91.27	15.63	17.02	6.4	4.56	3.49	5.01	5.44	22.51	27.1	93.92	92.13	9.09	11.64	3.37	2.71

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Project Summary

Project Title: AG Wishon – Replace Exciter

Major Work Categories: 2M
Planning Order Numbers: 5808902
Project Start Date: 2027
Project Completion Date: 2030
Operative Date (only applies to Capital): July 2030

Project Description

A.G. Wishon is a four-unit facility that was commissioned in 1910. Each General Electric unit is rated for 4 kVA at 2.3kV. There are two exciters shared among the four units. One General Electric exciter is rated for 100 kW at 250 Volts and other is rated for 125 kW at 250 Volts. This existing equipment is aging and obsolete with replacement parts and equipment being considered end-of-life cycle.

The existing two exciters along with DC field breaker, generator field breaker and rheostat will be removed and replaced with a new Basler DECS 400, or industry equal, full static excitation system. Additionally required support hardware will be engineered and installed as well.

To help ensure a successful commissioning, PG&E will have the manufacturer's representative on site for testing and startup of the new equipment. All training needed to operate and maintain the new equipment will be provided by the selected manufacturer's representative.

Justification

This project is necessary due to the age and criticality of the equipment. If these components failed before being replaced, A.G. Wishon would be curtailed or forced out of service.

The primary risk factor driving this project is generation reliability. If the exciter were to fail, the powerhouse would likely end up offline. These parts are critical to the operation, require a lengthy engineering process, have a very long lead time for parts procurement, and the construction window must align with powerhouse planned outages.

Cost

The cost assumptions for this project is based on professional judgment of the local engineering and hydro team familiar with this type of work. Cost information is predicated on both historical exciter equipment costs and general rough order of magnitude assessment.

PACIFIC GAS AND ELECTRIC COMPANY
Chapter 3: Hydro Operations Costs
Project Summary

Major Project Spending Estimates
(Thousands of Nominal Dollars)

CAPITAL

Planning Order	Description	Operative Date	2024 CWIP	2025 Forecast	2026 Forecast	2027 Forecast	2028 Forecast	2029 Forecast	2030 Forecast	CWIP + 2025 - '30 Total
5808902	AG Wishon – Replace Exciter	July 2030				119	229	1,560	1,874	**3,783**

Benefits

- Potential avoidance of future O&M expense cost increases associated with maintaining this aging equipment.
- A higher level of power generation reliability resulting from a reduction in forced outages caused by this aging equipment. This results in a replacement power cost savings for customers.

Alternatives Considered

Status Quo – Do nothing. Results in an increase in future O&M expense cost increases associated with maintaining this aging equipment and a higher level of forced outages resulting in a higher level of replacement power costs for customers.

Alternative 1: Refurbish – Not feasible due to age of equipment.

Alternative 2: Replace (recommended) – This is the preferred and recommended alternative

Alternative 3: Reschedule by One Year – This alternative assumes the project is rescheduled by one year. This alternative has the same long-term benefits as the recommended alternative; however, in the short- term, this alternative is not recommended for the same reasons discussed in status quo.

PACIFIC GAS AND ELECTRIC COMPANY
Chapter 3: Hydro Operations Costs
Project Summary

Project Title: Alta Powerhouse – Replace Bypass Pipe

Major Work Categories: 2N
Planning Order Numbers: 5793571
Project Start Date: November 2021
Project Completion Date: June 2028
Operative Date (only applies to Capital): October 2026

Project Description

The spill pipe is an original 1902 vintage with significant degradation issues. The pipe has received intermittent repairs and replacements to extend its useful life. The bypass water system currently has limited bypass capability to meet Placer County Water Agency (PCWA) water delivery obligations when Alta Powerhouse is unable to pass water through the unit. This project proposes to install a new bypass pipe from the newer active penstock to the Alta Powerhouse Tailrace. The project would also include a new guard valve and control valve along with an energy dissipator.

Justification

This project results in a reliable water bypass path around Alta Powerhouse. This gives PG&E the ability to retire the remaining generation unit at Alta Powerhouse as a cost savings measure for customers without affecting PG&E's water delivery obligations to PCWA.

Cost

The cost assumptions for this project are based on professional judgment of the local engineering and hydro team familiar with this type of work.

Major Project Spending Estimates
(Thousands of Nominal Dollars)

CAPITAL

Planning Order	Description	Operative Date	2024 CWIP	2025 Forecast	2026 Forecast	2027 Forecast	2028 Forecast	2029 Forecast	2030 Forecast	CWIP + 2025 - '30 Total
5793571	Alta PH – Install Penstock Bypass	October 2026	486	983	1,657	47				**3,172**

PACIFIC GAS AND ELECTRIC COMPANY
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Project Summary

Benefits

The objective of this project is to provide a reliable bypass for water delivery to PCWA from Alta Forebay to water customers that receive water through the Towle canal. Providing this reliable bypass allows PG&E to retire the remaining generation unit at Alta Powerhouse while still meeting its water delivery obligations to PCWA as a cost savings measure for customers.

Alternatives Considered

Status Quo: Do nothing - This alternative does not allow PG&E to retire the remaining generation unit at Alta Powerhouse as a cost savings measure for customers.

Alternative 1: Tap into the penstock and pipe over old penstock and release flow into tailrace **-** This is the recommended alternative. This is the least cost alternative that meets the project objective. This alternative will provide a reliable bypass around the powerhouse allowing PG&E to retire the remaining generation unit at Alta Powerhouse while still meeting its water delivery obligations to PCWA. This is a cost savings measure for customers.

Alternative 2: Tap into the penstock and pipe over old penstock and across tailrace into Lower Boardman Diversion and Weir - This alternative is not recommended as the turbidity from the bypass into the diversion would be too high. This alternative would violate PG&E's FERC license.

Alternative 3: Remove Unit 1 and bypass through the wheel pit in the powerhouse - This alternative is not recommended due to the excessive head pressure that comes off the penstock. A large energy dissipater would need to be included, which is too large to fit inside the footprint of the powerhouse.

PACIFIC GAS AND ELECTRIC COMPANY
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Project Summary

Project Title: Balch 1 – Replace Penstock Shutoff Valve

Major Work Categories: 2M
Planning Order Numbers: 5779418
Project Start Date: 2019
Project Completion Date: 2028
Operative Date (only applies to Capital): October 2028

Project Description

The Balch powerhouse is located on the Kings River, in Fresno County, California, about 60 miles east of the city of Fresno. The existing Balch 1 powerhouse, commissioned in 1927, provides generation flow from a reservoir to the powerhouse via an approximately 6,000-foot-long penstock.

The Balch 1 penstock shutoff valve (PSV) is a 60-inch diameter motor operated butterfly valve. This valve is part of the original equipment that was commissioned in 1927. The operating mechanism is a high torque electric motor driven by 440V AC power. The valve is controlled by a reversing starter that requires manual reset (valve opening) via the “Open” push-button at the valve house when tripped (valve closing) either manually or by electrical solenoid. The PSV can be electrically tripped by the excess flow device or by the “Close” push-button in the valve house or remotely from the powerhouse. Historical documentation has shown that the valve leaks excessively to the point where work could not be performed downstream of the valve without additional sand bagging and drainage measures being put in place. Replacement of the valve is necessary due to the condition and location of the valve.

Justification

Historical documentation has shown that the valve leaks excessively to the point where work could not be performed downstream of the valve without additional sand bagging and drainage measures being put in place. Due to the vintage and condition of the valve, refurbishment of the valve was not explored as a feasible alternative since it would not be possible to purchase replacement parts. The outage duration was another driver for not considering refurbishment of the valve as it would increase the construction window past the target return to service date due to the time it would require removing the valve, disassembling the valve and having replacement parts custom manufactured. Replacement of the valve in the existing location is the fiscally responsible recommended alternative. Replacement of the valve will ensure the safety of crews working downstream in the Balch 1 powerhouse when the PSV is used for lockout-tagout (LOTO). The replacement valve will include a new High-Pressure Unit with a hydraulic solenoid valve and counterweight for opening and closing the valve, addressing concerns around the existing aging high torque electric motor. Lastly, with the replacement valve, PG&E has the capability to replace the penstock excess flow protection system in accordance with PG&E Hydro Electric Design Standards (HEDS). The PG&E excess flow protection design standard requires that the differential pressure signals, alarms, and remote PSV controls between the valve house and powerhouse be over a communication link between Supervisory Control and Data Acquisition (SCADA) Remote Terminal Units (RTUs) at each location.

PACIFIC GAS AND ELECTRIC COMPANY
Chapter 3: Hydro Operations Costs
Project Summary

Cost

The cost assumptions for this project are based on professional judgment and historic PG&E cost data for similar work.

Major Project Spending Estimates
(Thousands of Nominal Dollars)

CAPITAL

Planning Order	Description	Operative Date	2024 CWIP	2025 Forecast	2026 Forecast	2027 Forecast	2028 Forecast	2029 Forecast	2030 Forecast	CWIP + 2025 - '30 Total
5779418	Balch 1 - Replace PSV	October 2028	2,461	-	1,633	3,783	1,390			**9,268**

Benefits

Completion of this work will allow reliable and safe operation of the Balch 1 Penstock Shutoff Valve. This project reduces the likelihood of forced outages, avoids the incremental costs of an emergency project and helps ensure the long-term reliability of the Balch 1 Powerhouse. A reduction in forced outages results in customer replacement power cost savings.

Alternatives Considered

Status Quo: Do nothing – This alternative is not recommended. This valve is nearly 100 years old and has deteriorated over the years to the point that is leaks excessively when closed putting maintenance personnel in danger when working downstream of the valve. Sand bagging and drainage measures are no longer considered as a viable safety measure to protect personnel working downstream of the valve. This alternative will likely result in excessive capital costs of an emergency project once the valve fails and the associated additional outage time resulting in replacement power costs for customers.

Alternative 1: PSV Replacement – This is the recommended alternative. This alternative will allow for reliable and safe operation of the Balch 1 Penstock Shutoff Valve. This alternative reduces the likelihood of forced outages, avoids the incremental costs of an emergency project and helps ensure the long-term reliability of the Balch 1 Powerhouse. Replacement in the current location has the advantage of re-using an existing structure and footprint as well as less modification to the penstock and flanges, assuming they are in good condition. This alternative also minimizes the modifications required to the existing power and control system wiring and routing. This comes with the disadvantage of less access to the work area, the need for a cart system or sky crane rental to transport larger items, and a longer project duration. Overall cost and manhours required will be higher for this alternative than the other option, however less risk to damage of the penstock with long term generation reliability risks. This is the preferred alternative.

Alternative 2: New Valve house location and PSV – This alternative is not recommended. It has the advantage of all components being new and no major restrictions on the work area. Options for more valve features like a counterweight or standalone HPU can be installed if desired, and the valve house can easily be accessed for future maintenance and inspections. Construction costs and manhours are estimated to be lower than PSV replacement in the current location. The downside of a new valve house is that it will require removal of a large section of the penstock and welding of new flanges, more extensive modifications to the existing power and control system wiring and routing, requires the design, analysis, and installation of a new building grounding system that must be tied into the existing grounding system, and an additional building to maintain.

PACIFIC GAS AND ELECTRIC COMPANY
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Project Summary

Project Title: Balch 1 – Replace Governor

Major Work Categories: 2M
Planning Order Numbers: 5739698
Project Start Date: 2015
Project Completion Date: 2029
Operative Date (only applies to Capital): December 2029

Project Description

Balch 1 Powerhouse is located on the North Fork of the Kings River, east of Fresno, California. The system includes a diversion dam, intake structure, tunnel, penstock and powerhouse. The prime mover is an Allis Chalmers double overhung horizontal impulse turbine. The powerhouse has an operating capacity of 34 Megawatts (MW).

The governor system, originally an Allis Chalmers installed in 1927, was upgraded to a Woodward "electronic" 505H type in 1989. As was typical with this vintage of electronic governors, the control boards are prone to failure. The amp driver board failed in 2003 and in 2009, causing a total of around 5000 MW hours of potential lost generation. These control boards are no longer manufactured, and they must be repaired after their circuitry fails. This fix creates reliability concerns. This governor controller is proprietary and very difficult to troubleshoot, exacerbating the forced outage duration from simple failures. The internal and external expertise with the 505H type of governor has become increasingly hard to come by due to the governor being obsolete technology which has also exacerbated the forced outage durations. Based on the reliability and maintenance justifications presented, it is recommended to replace the existing U1 governor with a modern Programmable Logic Controller (PLC) governor and install new servomotors.

Justification

Project justification is based on increasing governor system reliability by bringing it up to industry standards as it has reached its end of life. As the equipment ages, it requires additional maintenance funded by expense and increases the risk of an unplanned outage, reducing power generation reliability.

Cost

The cost assumptions for this project are based on professional judgment and historic PG&E cost data for similar work.

PACIFIC GAS AND ELECTRIC COMPANY
Chapter 3: Hydro Operations Costs
Project Summary

Major Project Spending Estimates
(Thousands of Nominal Dollars)

CAPITAL

Planning Order	Description	Operative Date	2024 CWIP	2025 Forecast	2026 Forecast	2027 Forecast	2028 Forecast	2029 Forecast	2030 Forecast	CWIP + 2025 - '30 Total
5739698	Balch 1 – Replace Governor	December 2029	-	347	572	2,081	683			**4,359**

Benefits

This project will result in the following:

- Potential avoidance of future O&M expense cost increases associated with maintaining this aging equipment.
- A higher level of power generation reliability resulting from a reduction in forced outages caused by this aging equipment. This results in a replacement power cost savings for customers.

Alternatives Considered

Status Quo (Do Nothing) – This alternative assumes no action is taken to complete the recommended scope of work scheduled for the Balch 1 Governor and equipment is kept operating with no additional modifications. Continued operation of the existing equipment will lead to further deterioration, increased maintenance, decreased reliability and an increase in replacement power costs for customers. This alternative assumes there is a 1 in 20-year probability that the unit is forced out and requires an emergency replacement due to obsolete governor equipment and/or proprietary software failure. This alternative is not recommended.

Alternative 1: Replace Balch 1 Governor (Recommended) – This is the preferred alternative. The avoidance of future O&M expense cost increases associated with maintaining this aging equipment and a higher level of power generation reliability resulting from a reduction in forced outages caused by this aging equipment (and the resulting replacement power cost savings for customers) associated with the governor and bringing the system to current standards with a modern Programmable Logic Controller, make this the recommended alternative.

Alternative 2: Major Repair/Refurbishment – Due to the vintage of the existing governor, the ability to refurbish and find replacement parts for the governor is difficult and costly. The internal and external expertise with the 505H type of governor has become increasingly hard to come by due to the governor being obsolete technology which has also exacerbated the forced outage durations. This alternative is not recommended due to the costs of replacement parts, inability to troubleshoot locally (major impacts during a forced-out situation) and the lack of expertise with 505H type governors.

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Project Summary

Project Title: Balch 1 – Replace 13.2 kV Med Volt Switchgear

Major Work Categories: 2M
Planning Order Numbers: 5806587
Project Start Date: 2024
Project Completion Date: 2028
Operative Date (only applies to Capital): March 2028

Project Description

The Balch Powerhouse is a three-unit facility located in two buildings on the North Fork Kings River near Fresno, California. Balch 1 generator is rated at 13.2kV, 33MVA. The Balch 1 13.2kV switchgear is old and has reached its end of life. The 13.2kV switchgear consists of a disconnect switch, a generator breaker, a feeder breaker, two sets of three phase CT's and two sets of two single phase potential transformers. All equipment inside the switchgear is old and replacement parts are obsolete.

The 13.2kV switchgear consists of a 2000A disconnect switch that is interlocked with the generator breaker. The generator breaker (52-1) and a feeder breaker (52-21) will both be replaced. The generator breaker bus side has two sets of 2000/5 CT's being used for generator protection set A and set B relays. The feeder breaker load side also has two sets of CT's. One set is 2000/5 used for transformer protection relays. Other set is 200/5 that is being used for overcurrent relay, ISO meter and watt/watt hour transducer. The 13.2kV switchgear also has two sets of single-phase potential transformers that are used for synching, metering and protection relays. This project would replace the 13.2kV switchgear and all components in it.

The existing 12kV, 2000A switchgear located on the generator floor at Balch 1 powerhouse is old and reached its end of life. The 12kV switchgear consists of three medium voltage circuit breakers (52-22, 52-23 and 52-24) with one set of three phase current transformers on the load side of each circuit breaker. The current transformers are 50/5 ratio and are used for overcurrent protection and metering. The overcurrent relays, relay cutout switch, and watt hour meter and its test switches for the breakers 52-22 and 52-23 are located at the 12kV switchgear and will be replaced with new relays and meters. The feeder to the 12kV switchgear used to be an underground cable that failed a few years ago and the switchgear was bypassed to provide power to Balch Camp. This project will restore the feeder to the new 12kV switchgear using an aerial feed from the switchyard located voltage regulator. The 12kV switchgear is preferred to be located at the mezzanine beside/within the new 13.2kV switchgear.

Justification

This switchgear has exceeded its useful life expectancy and is due for replacement. Project justification is based on increasing switchgear reliability by bringing it up to industry standards as it has reached its end of life. As the equipment ages, it requires additional maintenance funded by expense and increases the risk of an unplanned outage, reducing power generation reliability.

PACIFIC GAS AND ELECTRIC COMPANY
Chapter 3: Hydro Operations Costs
Project Summary

Cost

The cost assumptions for this project are based on professional judgment and historic PG&E cost data for similar work.

Major Project Spending Estimates
(Thousands of Nominal Dollars)

CAPITAL

Planning Order	Description	Operative Date	2024 CWIP	2025 Forecast	2026 Forecast	2027 Forecast	2028 Forecast	2029 Forecast	2030 Forecast	CWIP + 2025 - '30 Total
5806587	Balch 1 – Repl 13.2 kV Med Volt Switchgear	March 2028	45	-	226	1,940	711			**2,922**

Benefits

- Potential avoidance of future O&M expense cost increases associated with maintaining this aging equipment.
- A higher level of power generation reliability resulting from a reduction in forced outages caused by this aging equipment. This results in a replacement power cost savings for customers.

Alternatives Considered

Status Quo (Do Nothing) - This alternative proposes PG&E does nothing. This alternative is not preferred given that the age and difficulty of procuring replacement parts for the existing Balch 1 switchgear. This alternative results in an increase in future O&M expense cost associated with maintaining this aging equipment, higher capital costs for the expedited work, and a higher level of forced outages resulting in a higher level of replacement power costs for customers.

Alternative 1: Balch 1 Replace 13.2 kV switchgear - This alternative proposes PG&E replace the 13.2kV switchgear and 12kV at the Balch 1 Powerhouse. This is the preferred alternative.

Alternative 2: Delay Balch 1 Replace 13.2 kV switchgear project by one year - This alternative assumes the project is rescheduled by one year. This alternative has the same long-term benefits as the recommended alternative; however, in the short-term, this alternative is not recommended for the same reasons discussed in status quo.

PACIFIC GAS AND ELECTRIC COMPANY
Chapter 3: Hydro Operations Costs
Project Summary

Project Title: Balch 1 Replace 115 kV Switching Structure

Major Work Categories: 2P
Planning Order Numbers: 5804261
Project Start Date: 2024
Project Completion Date: 2028
Operative Date: March 2028

Project Description

The Balch 1 Powerhouse sits on the upper North Fork of the Kings River and is accompanied by a 115kv switchyard structure. The switchyard structure is used to transmit the energy generated at Balch 1 to the grid. The Balch 1 powerhouse and switchyard were commissioned in 1927. This project proposes to investigate the switchyard structure structural integrity, engineer long term solutions, remove abandoned components of the structure and rebuild any faulty or failed switchyard structure components.

Justification

PG&E has identified the switchyard structure as a high-risk facility. This structure requires frequent maintenance and represents a single point of failure, a failure that will result in the inability to transfer generation from Balch 1 to the grid. This project will benefit the surrounding environment and customers by reducing the chance of a catastrophic wildfire and improving power generation & transmission reliability.

Cost

The cost assumptions for this project are based on the professional judgment of the engineers familiar with this type of work, historic PG&E cost data for similar work and secured proposals cost from vendors, constructors, and industry professionals along with estimated installation overheads.

Major Project Spending Estimates
(Thousands of Nominal Dollars)

CAPITAL

Planning Order	Description	Operative Date	2024 CWIP	2025 Forecast	2026 Forecast	2027 Forecast	2028 Forecast	2029 Forecast	2030 Forecast	CWIP + 2025 - '30 Total
5804261	Balch 1 – Rpl 115kV Switching Structure	March 2028	65	-	193	3,159	624			**4,041**

Benefits

This project will benefit the surrounding environment and customers by reducing the risk of catastrophic wildfires and improving power generation & transmission reliability. A higher level of power generation reliability is expected resulting from a reduction in forced outages caused by this aging equipment. This results in replacement power cost savings for customers. This project improves transmission system reliability for electric customers in Fresno County by reducing the number of Customers Experiencing Sustained Outages (CESO) and Customers Experiencing Multiple Interruptions (CEMI) in the event the structure fails and causes a catastrophic wildfire.

Alternatives Considered

Status Quo: Do nothing - This alternative is not recommended. This alternative results in a continued high risk of catastrophic wildfires and the continued risk to power generation and transmission reliability putting

customers at risk of electric service outages and replacement power costs.

Alternative 1: Replace Balch 1 115 kv Switching Structure – This is the recommended alternative. Replacing the 115kv Switching Structure will substantially reduce the risk of catastrophic wildfire and result in replacement power cost savings for customers.

PACIFIC GAS AND ELECTRIC COMPANY
Chapter 3: Hydro Operations Costs
Project Summary

Project Title: Balch 2 – Arc Flash Mitigation of Overstressed Breakers

Major Work Categories: 2L
Planning Order Numbers: 5800778
Project Start Date: 2022
Project Completion Date: 2028
Operative Date (only applies to Capital): March 2028

Project Description

The Balch 2 powerhouse is located on the North Fork of the King's River in Fresno County and contains two units that were commissioned in 1958. Unit 2 and Unit 3 are Pelton Wheel Turbine Generators.

The purpose of this project is to replace the 120/208V switchboard and equipment with low voltage circuit breakers that have higher interrupting capacities (30kA or more). The new breakers will address the current overstress condition and mitigate the arc flash hazard. The existing switchgear has a voltage regulator and transfer switch as part of the lineup. The undervoltage relays for each source, associated auxiliary relay, relay cutout switch and the lockout relay mounted on the switchgear will be replaced with new equipment. The station service meters and overcurrent relay that are mounted in the control room will be retained and not replaced with this Scope of Work. Three circuit breakers on the existing switchgear are used to feed emergency lighting. These three breakers will be replaced with new circuit breakers that are dual rated for AC and DC. The existing lighting cabinets A, B and C will be retained and not replaced as part of this project. The existing bus feeding the three main breakers, 52-12, 52-13 and 52-14, will be redone if needed to line up the new switchgear feed.

Justification

The Balch 2 Powerhouse Arc Flash Hazard Assessment report from Applied Technology Services (ATS) has identified Westinghouse Types F and J molded case circuit breakers on the three-phase 208-volt Station Service Bus as overstressed. These Westinghouse Type F & J breakers serve critical plant equipment such as high-lift, cooling water pumps, transformer oil pumps, and transformer control cabinet. Forty-seven (47) of these breakers were found to be overstressed.

The failure of these low voltage circuit breakers to operate may result to an electrical fault, failure to protect equipment being served by these breakers and potentially an arc flash event causing injury to an employee in proximity of the breakers.

The Alternative Study confirms replacing the overstressed circuit breakers in the 208V switchgear with new higher fault interrupting rated circuit breakers will resolve the overstress problems. It is recommended the existing overstressed breakers be replaced with the new Square D Power Pact H Frame and J-Frame type or equivalent.

PACIFIC GAS AND ELECTRIC COMPANY
Chapter 3: Hydro Operations Costs
Project Summary

Cost

The cost assumptions for this project are based on professional judgment and historic PG&E cost data for similar work.

Major Project Spending Estimates
(Thousands of Nominal Dollars)

CAPITAL

Planning Order	Description	Operative Date	2024 CWIP	2025 Forecast	2026 Forecast	2027 Forecast	2028 Forecast	2029 Forecast	2030 Forecast	CWIP + 2025 - '30 Total
5800778	Balch 2 – Arc Flash Mitigation of Overstressed Breakers	July 2030	191	-	181	3,605	500			**4,476**

Benefits

- Increased safety to personnel working on and around the equipment in question by reducing the hazard of an arc flash event causing injury to an employee in proximity of the breakers.
- A higher level of power generation reliability resulting from a reduction in forced outages caused by this aging equipment. This results in a replacement power cost savings for customers.

Alternatives Considered

Status Quo (Do Nothing) - This alternative proposes PG&E does nothing. This alternative is not preferred given that the existing breakers in the 208/120V switchgear at Balch 2 are overstressed. This is not the preferred alternative as the existing overstressed breakers could cause an arc flash event causing injury to an employee in proximity of the breakers.

Alternative 1: Balch 2 Replace 120/208V switchboard and breakers w/ 408V - This alternative proposes PG&E replace the 208V switchgear and overstressed circuit breakers at the Balch 2 Powerhouse with a 408V switchgear option. This is not the preferred alternative because this option will be costly and there will be real estate issues because a new 480V switchgear and three new step-down (480/208/120V) transformers will be needed.

Alternative 2: Balch 2 Replace 120/208V switchboard and breakers - This alternative proposes PG&E replace the 208V switchgear and overstressed circuit breakers at the Balch 2 Powerhouse. This is the preferred alternative.

Alternative 3: Balch 2 Replace 120/208V switchboard and breakers delay by one year - This alternative assumes the project is rescheduled by one year. This alternative ultimately has the same long-term benefits as the recommended alternative; however, in the short-term, this alternative is not recommended for the same reasons discussed in status quo.

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Project Title: Balch 2 Equipment Life Cycle Replacement

Major Work Categories: 2M
Planning Order Numbers: 5780659, 5788228
Project Start Date: 2020
Project Completion Date: 2028
Operative Date (only applies to Capital): 5780659 – October 2028, 5788228 – March 2028

Project Description

The Balch 2 powerhouse is located on the North Fork of the King's River in Fresno County and contains two units that were commissioned in 1958. Unit 2 and Unit 3 are Pelton Wheel Turbine Generators. The Unit 2 Generator was rewound in 2013, and the Unit 3 Generator was rewound in 2016. Both generators are rated for 61.60/70.84 MVA (ratings for 60°/80°C rise over ambient).

The existing Bank 2 and 3 Generator Step-up (GSU) Transformers are two-winding, three-phase transformers rated for 54 MVA FOW (forced oil, water cooled), 230kV/13.8kV in a wye-delta configuration. The GSU Transformers are located outside in the GSU Transformer Yard on the south side of the control building adjacent to Station Service Transformers 2 and 3, the disconnect switches for the Bank 2 and 3 GSU Transformers, and the associated isophase bus. The existing secondary containment is comprised of gravel and culverts that lead to a common containment pit. The Bank 2 and 3 GSU Transformers, Station Service Transformers 2 and 3, and their associated disconnect switches are on concrete foundations within the containment area. The existing GSU Transformer low-voltage side leads are comprised of isophase bus from the GSU disconnect switches to the GSU low voltage bushings. The existing GSU high-voltage side leads are routed overhead from the GSU Transformer high-voltage bushings to the Power Circuit Breaker located in the switchyard across the access road from the GSU Transformer Yard. The existing Bank 2 and 3 GSU Transformers high-voltage side leads and surge arresters are supported by steel structures located in the GSU Transformer Yard above the GSU Transformers. The ground cables associated with the surge arresters are routed to the ground grid via stand-off insulators mounted to the control building wall adjacent to the GSU transformers.

This project will replace the existing Bank 2 and 3 GSU Transformers at the Balch 2 Powerhouse. The existing transformers will be removed, as well as their associated ancillary equipment and power and control cables. The new GSU transformers will be installed in the same location as the existing GSU transformers in the transformer yard adjacent to the control building's south wall. The existing isophase bus will be retained and modified, if and as needed, for connection to the new GSU transformers. The GSU Transformer foundations will be modified to accommodate the new GSU Transformer. The existing containment will be modified as needed based on the oil volume of the new GSU transformers.

Justification

PG&E's High Voltage Transformer Asset Management Program has identified the Balch 2 GSU Transformer Bank 2 and Bank 3 as high priority in the transformer fleet that needs to be scheduled for replacement. Balch 2 Bank 2 and Bank 3 has been in service since 1965. Due to the age of the transformers and elevated gas levels

as shown in an oil analysis, replacement is recommended. This project will help to mitigate the risks associated with the transformers.

Cost

The cost assumptions for this project are based on professional judgment and historic PG&E cost data for similar work.

Major Project Spending Estimates
(Thousands of Nominal Dollars)

CAPITAL

Planning Order	Description	Operative Date	2024 CWIP	2025 Forecast	2026 Forecast	2027 Forecast	2028 Forecast	2029 Forecast	2030 Forecast	CWIP + 2025 - '30 Total
5780659	Balch 2 – Bank 3 Replacement	October 2028	890	-	429	5,626	2,130			**9,076**
5788228	Balch 2 – Bank 2 Replacement	March 2028	873	-	426	6,501	1,384			**9,183**

Benefits

Potential avoidance of a catastrophic failure of one or both transformers resulting in:

- A higher level of personnel safety in vicinity of these transformers.
- Reduction in forced outage time caused by in-service failure of this aging equipment, resulting in greater power generation reliability and, therefore, replacement power cost savings for customers.
- Avoidance of higher capital costs to replace the transformers on an expedited basis after an in-service failure.

Alternatives Considered

Status Quo: Do Nothing; not recommended. This alternative assumes that no action is taken other than routine maintenance. This is not considered a viable alternative due to the high likelihood of failure and the resulting risk to personnel safety; extensive generation loss associated with a lengthy forced outage and the resulting replacement power cost to customers; and the higher capital costs to replace the transformers on an expedited basis after an in-service failure.

Alternative 1: Replacement of Bank 2 and Bank 3 – This alternative is the recommended alternative. Replacing the GSU transformers will mitigate safety and reliability issues saving customers from having to pay for replacement power costs and saving customers from higher capital costs to replace the transformers on an expedited basis after an in-service failure.

Alternative 2: Reschedule One Year – Not recommended. This alternative assumes the project is delayed one year. It ultimately has the same long-term benefits as the recommended alternative; however, in the short-term, it also assumes the same risks and disadvantages as the status quo alternative.

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Project Summary

Project Title: Balch 2 U2 and U3 Replace Cooling Water System

Major Work Categories: 2M
Planning Order Numbers: 5758119, 5760617
Project Start Date: 5758119 – 2015, 5760617 – 2016
Project Completion Date: 2027
Operative Date: 5758119 – October 2027, 5760617 – October 2026

Project Description

It is recommended to replace the Balch 2 Unit 2 (U2) and Unit 3 (U3) Powerhouse (PH) generator cooling water system and controls. The scope of work for the Balch 2 U2 and U3 cooling water project includes:

- Complete replacement of cooling water piping, valves, and instrumentation for U2 and U3. The replacement does not include replacing bearing cooling coils or air surface coolers.
- Rerouting the cooling water such that all cooling water lines are strained by a single auto-strainer. The addition of a simplex strainer bypass for the auto-strainer.
- Replacement of the cooling water supply pumps and motors for U1 and U2 and the in-line spare.
- Replacing the existing manual control system with a PLC based control system.
- Installing additional instrumentation for PLC based control system.
- Final commissioning of the U3 cooling water system.

Justification

The existing Balch 2 U2 and U3 PH generator cooling water systems are the original systems put in place when the PH was commissioned in 1958. The systems are restricted due to pipe corrosion and accumulated sedimentation and have reached their end of life. This restriction negatively impacts the cooling water flow rate to the generator air surface coolers and bearing oil coolers. The restriction has resulted in unit trips and unusually high bearing temperatures. It is recommended to replace the existing piping, valves, instrumentation, and controls for U2 and U3 cooling water systems.

Cost

The cost assumptions for these projects are based on professional judgment and historic PG&E cost data for similar work.

Major Project Spending Estimates
(Thousands of Nominal Dollars)

CAPITAL

Planning Order	Description	Operative Date	2024 CWIP	2025 Forecast	2026 Forecast	2027 Forecast	2028 Forecast	2029 Forecast	2030 Forecast	CWIP + 2025 - '30 Total
758119	Balch 2, Unit 2 – Replace Cooling Water Piping	October 2027	3,144	1,455	155	998				**5,752**
5760617	Balch 2, Unit 3 – Replace Cooling Water Piping	October 2026	2,756	2,016	910					**5,682**

Benefits

The benefits of these projects are that they restore cooling capacity and cooling efficiency of the systems resulting in a potential longer life for the generator and bearing equipment that this system cools. Replacing this system results in the avoidance of future O&M expense cost increases associated with maintaining this aging equipment. In addition, a higher level of power generation reliability will be realized resulting from a

reduction in forced outages caused by this aging equipment. This results in a replacement power cost savings for customers.

Alternatives Considered

Status Quo – This alternative is not recommended due to the significant decrease in cooling water flow that the piping is already experiencing. By allowing the corrosion inside the piping to continue to become worse, the reliability of the unit decreases. Likewise, allowing the cooling capacity to be decreased will result in derating the generating capacity or in the failure of other key turbine-generator systems resulting in a forced curtailment or forced outage. This results in a replacement power costs for customers. This alternative also results in a future O&M expense cost increase associated with maintaining this aging equipment.

Alternative 1: Replace Cooling Water System - It is recommended to replace the cooling water piping, valves, pumps, motors, and controls in order to increase cooling efficiency at the powerhouse and eliminate future forced outages and costly repairs.

Alternative 2: Reschedule Cooling Water System Replacement - This alternative assumes the same consequences as the status quo for the year that the project is deferred. Deferral of the work would allow the piping to acquire more corrosion and continue to decrease cooling water capacity.

Alternative 3: Repair Cooling Water System – This alternative assumes that repairs are made to the cooling water system temporarily alleviating the lack of cooling water capacity that the system is currently experiencing. The worst pipe sections would be identified and replaced every 5 years. This would have similar consequences as status quo but would prevent the probability of failure from increasing over time. This is also a more costly alternative.

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Project Summary

Project Title: Balch Relicensing and/or License Conditions

Major Work Categories: 3H
Planning Order Numbers: 5767854, 5812237
Project Start Date: 5767854 – 2020, 5812237 – 2030
Project Completion Date (only applies to Capital): 5767854 – 2029, 5812237 – 2033
Operative Date (only applies to Capital): 5767854 – March 2029, 5812237 – December 2032

Project Description

The Balch Project includes two powerhouses located in the Kings River Watershed in Central California. The Balch No.1 & No.2 powerhouses have a combined normal operating capacity of 139 MW.
The current Project license expires in 2026. This relicensing project is expected to result in the Company obtaining a new long-term Federal Energy Regulatory Commission (FERC) license for the Project, which will allow PG&E to continue to provide safe and reliable electric generation to our customers in a responsible and environmentally sensitive manner. FERC's Traditional Licensing Process is being used to obtain a new 50-year operating license. The Final Application for New License was filed with FERC on April 19, 2024. When the license expires in 2026 the Project will operate under annual licenses until a new license is issued by FERC consistent with completion of both federal and state-level environmental review processes.

The forecast cost also includes the work necessary to implement the anticipated license conditions in the new license. License implementation begins when FERC issues a new License.

Justification

Under the Federal Power Act (FPA), the owner of a hydropower project must obtain a license from FERC to operate its project. At the end of the license term, a licensee may apply to relicense its project. The FPA and FERC's implementing regulations specify a comprehensive and rigorous process a licensee must complete to successfully renew its license. The minimum 5-year regulatory process, which often takes substantially longer to complete, includes extensive stakeholder involvement, performance of comprehensive resource studies and balancing of complex societal and environmental issues. Licensees must be highly engaged with stakeholders and plan relicensing activities prior to the relicensing process beginning with filing of a Notice of Intent and Pre-Application Document and must continue relicensing activities through filing the License Application and subsequent environmental review processes leading to issuance of the new license by FERC. The schedule for issuance of a new license is generally uncertain and can take decades.

Until the new license order has been issued, new license conditions are uncertain; however, the licensee's cost forecasts (capital and expense) are based on engagement with regulatory agencies and stakeholders throughout the relicensing proceeding, National Environmental Policy Act (NEPA) and California Environmental Quality Act (CEQA) environmental reviews, regulatory processes, and intermediate steps. Cost estimates to implement new license requirements are refined iteratively throughout the relicensing process based on a growing availability of information.

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Due to many layers of regulatory processes, the schedule for FERC's issuance of a New License can be uncertain and subject to authority and activities beyond the licensee's control. A licensee cannot always accurately forecast the scope and costs of license implementation because the measures that will be required are not known in advance and often take years of study of potential impacts before new operating conditions can be specified. This is why PG&E has requested, and the Commission has approved this work be subject to balancing account treatment.

Cost

The cost assumptions for these projects are based on the professional judgment of the engineers and licensing professionals familiar with this type of work and historic PG&E cost data for similar work.

The new FERC License Conditions are uncertain until the license is issued by FERC; however, the cost forecasts are based on study results and discussions held with the regulatory agencies and stakeholders throughout the relicensing process, and on the Company's experience with implementing recent similar License conditions.

Major Project Spending Estimates
(Thousands of Nominal Dollars)

CAPITAL

Planning Order	Description	Operative Date	2024 CWIP	2025 Forecast	2026 Forecast	2027 Forecast	2028 Forecast	2029 Forecast	2030 Forecast	CWIP + 2025 - '30 Total
5767854	Balch 1 & 2 Relicensing	March 2029	8,767	1,886	1,578	1,375	803	808		**15,216**
5812237	Balch 1 & 2 RL – Capital Licensing Conditions	December 2032							9,083	**9,083**

Benefits

The benefit of this project is to obtain a new FERC license for the Balch FERC Project (P-175) so that PG&E can continue to operate Balch No.1 & No.2 powerhouses to benefit customers and the general public.

Alternatives Considered

Status Quo: Do nothing - This alternative is not recommended. Under this alternative, PG&E would simply abandon the FERC licensing process that has already begun. The result of which would be PG&E's current FERC license not being renewed, and PG&E would not be able to continue operating the Balch powerhouses. If PG&E would choose to continue to operate, exorbitant fines from FERC would be incurred and potentially risking PG&E's good standing with FERC.

Alternative 1: Continue to license the Balch Project and plan to implement the license conditions – This is the recommended alternative. Under this alternative, PG&E customers and the general public would continue to receive all the benefits of the Balch Project.

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Project Summary

Project Title: Battle Creek Salmon/Steelhead Phases 1A & 2

Major Work Categories: 11
Planning Order Numbers: 5733458
Project Start Date: 2013
Project Completion Date: 2028
Operative Date (only applies to Capital): December 2027

Project Description

Battle Creek Salmon/Steelhead Phase 2 consists of work associated with South Diversion Dam and South Canal Removal, Soap Creek Feeder Diversion Dam Removal, Lower Ripley Creek Feeder Diversion Dam Removal, Coleman Diversion Dam Removal, and Coleman Canal Diversion Closure.

Justification

A Memorandum of Understanding (MOU) by and among the United States Bureau of Reclamation (USBR), National Marine Fisheries Service, U.S. Fish and Wildlife Service, California Department of Fish and Game, and Pacific Gas and Electric Company (PG&E) was signed in February 1999 to establish a restoration program for Chinook Salmon and Steelhead habitat in the reaches of Battle Creek below the natural water falls on the forks of Battle Creek that act as absolute barriers to fish passage.
PG&E agreed to pay all of its internal costs associated with a FERC license amendment and its own costs required to implement the Restoration Project. The USBR will fund the design, permitting and construction related costs. Due to various issues which prevented all components of work described in the MOU from being implemented simultaneously, the project was divided into three phases.

The costs for the new facilities are funded by USBR and turned over to PG&E for continued ownership, operation, and maintenance as specified in the 1999 MOU and related agreements. The PG&E cost for this implementation project will be capitalized and the value of the new facilities recorded for depreciation purposes.

Cost

The forecast was based on the effort from previously completed work for the same program under Phase 1A and 1B and assumed a similar level of effort would be required by PG&E to coordinate with The Bureau of Reclamation and their contractors for Phase 2. It was anticipated that PG&E's participation will include local water crew and operators, licensing coordinators, technicians, inspectors, engineering, subject matter experts, and PG&E contractors similar to previous phases to complete this final phase of the program.

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Project Summary

Major Project Spending Estimates
(Thousands of Nominal Dollars)

CAPITAL

Planning Order	Description	Operative Date	2024 CWIP	2025 Forecast	2026 Forecast	2027 Forecast	2028 Forecast	2029 Forecast	2030 Forecast	CWIP + 2025 - '30 Total
5733458	Battle Creek Salmon/ Steelhead Phases 1A & 2	December 2027	5,822	600	1,165	1,541				**9,128**

Benefits

Establish a restoration program for critical Chinook salmon and steelhead habitat in the reaches of Battle Creek below the natural water falls on the forks of Battle Creek that act as absolute barriers to fish passage while ensuring the continued operation of 38 MWs of air emission-free, RPS-eligible renewable source of electricity. This work complies with the 1999 MOU signed by PG&E, USBR, National Marine Fisheries Service, U.S. Fish and Wildlife Service, and the California Department of Fish and Game.

Alternatives Considered

Status Quo – Do Nothing – This alternative is not recommended. This alternative would abandon the work as is. No further improvements would be made. All costs to date would be transferred from capital to expense. PG&E is providing oversight as a requirement of the MOU to ensure that PG&E and customer interests are protected. Also, PG&E signed a cost sharing agreement with the USBR and multiple other regulatory and resource agencies. Failure to abide by this cost sharing agreement would expose the company to the risk of funding the entire cost of this over $20M salmon habitat restoration effort.

Alternative 1: Implement Project per MOU - This is the recommended alternative. It would execute the project as defined in the 1999 MOU. PG&E would provide oversight to assure PG&E and customer interests are protected and work is coordinated with operations to limit disruptions and customer costs. Facilities would be modified or removed to improve the salmon habitat along Battle Creek. PG&E would provide onsite representation and outside resources as needed to ensure compliance with all agreements and resolve issues that may arise. The project is currently in design.

Alternative 2: Defer Implementation of Alternative 1 by one year - This alternative would delay implementation of the project for one year. This alternative is not viable because the project is under a MOU and the project schedule is driven by USBR.

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Project Summary

Project Title: Battle Creek Salmon Restoration FERC License Amendment

Major Work Categories: 3H
Planning Order Numbers: 5718898
Project Start Date: 2011
Project Completion Date: 2026
Operative Date (only applies to Capital): December 2025

Project Description

The Company has agreed with the 1999 Memorandum of Understanding (MOU) signatories to implement the Battle Creek Salmon and Steelhead Restoration Project (Restoration Project). The Restoration Project is to be completed in three phases (Phase 1A, Phase 1B, and Phase 2) that each require a license amendment. PG&E has obtained license amendments and, in coordination with MOU partners, implemented the first two phases. The final phase of the Restoration Project, Phase 2, removes several dams and a canal on the South Fork of Battle Creek. The scope of this project is to obtain the necessary FERC approvals and California State Water Resources Control Board water quality certification for Phase 2 of the Restoration Project.

Justification

A MOU by and among Bureau of Reclamation (BOR), National Marine Fisheries Service, U.S. Fish and Wildlife Service, California Department of Fish and Game, and Pacific Gas and Electric Company (PG&E) was signed in February 1999 to establish a restoration program for Chinook Salmon and Steelhead habitat in the reaches of Battle Creek below the natural water falls on the forks of Battle Creek that act as absolute barriers to fish passage.

Per the MOU, PG&E agreed to pay internal costs associated with FERC license amendment and its own costs required to implement the Restoration Project; the Bureau of Reclamation will be the construction lead and fund the design, permitting, and construction related costs.

Cost

The cost assumptions for this project are based on the professional judgment of the engineers and licensing professionals familiar with this type of work and historic PG&E cost data for similar work.

Major Project Spending Estimates
(Thousands of Nominal Dollars)

CAPITAL

Planning Order	Description	Operative Date	2024 CWIP	2025 Forecast	2026 Forecast	2027 Forecast	2028 Forecast	2029 Forecast	2030 Forecast	CWIP + 2025 - '30 Total
5718898	Battle Creek Salmon Restoration FERC License Amendment	December 2025	5,088	200						**5,288**

Benefits

If these facilities are not removed as part of Phase 2, PG&E will need to remove them as part of the separate project to decommission the entire Battle Creek hydroelectric project. BOR currently is providing the funding for design, permitting, and construction for Phase 2 facilities; otherwise, PG&E will have to incur the entire costs of removing these facilities as part of decommissioning.

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Alternatives Considered

Status Quo: Do nothing – This alternative is not recommended. It is an irreversible FERC regulatory requirement for PG&E to surrender and decommission the Battle Creek Project, if PG&E does not do so PG&E will be out of compliance with FERC.

Alternative 1: Develop and submit to FERC a license surrender application and decommissioning plan - This is the recommended alternative. PG&E will need to remove the facilities as a separate project to decommission the entire Battle Creek hydroelectric project.

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Project Summary

Project Title: Battle Creek License Surrender

Major Work Categories: IG
Planning Order Numbers: 5279912
Project Start Date: 2025
Project Completion Date: 2028
Operative Date (only applies to Capital): Expense – n.a.

Project Description

PG&E's Battle Creek Hydroelectric Project is a FERC licensed project with five powerhouses that sit on the north and south fork of Battle Creek. Battle Creek is located in the Shasta and Tehama counties and has a normal operating capacity of 36-megawatt. Over recent years the Project has become uneconomic for PG&E to continue operating. With PG&E's decision to not relicense and with no third parties expressing interest to continue operating the Project, FERC has required PG&E to decommission the Project. The scope of this project includes the development and submittal to FERC of a license surrender application and decommissioning plan.

Justification

The company is surrendering the Battle Creek Hydroelectric Project license because the Project is no longer an economic source of power for PG&E's customers. In 2020 PG&E made the decision to not relicense which resulted in the hydro project entering the FERC "orphaned project" process. FERC solicited the interest of other entities to license the "orphaned" Project, but no other entity timely filed an application to license the Project. Therefore, pursuant to FERC regulations, PG&E was ordered by FERC to prepare a License Surrender Application including a decommissioning plan. Per the FERC approved plan and schedule, PG&E must submit a license surrender application and decommissioning plan within three years after FERC takes action on the license amendment applications for Inskip Removal and Phase 2 of the Restoration Project (both outside the scope of Battle Creek Surrender).

Cost

The cost assumptions for this project are based on the professional judgment of the engineers and licensing professionals familiar with this type of work and historic PG&E cost data for similar work.

Major Project Spending Estimates
(Thousands of Nominal Dollars)

EXPENSE

Planning Order	Description	2025 Forecast	2026 Forecast	2027 Forecast	2025 - '27 Total
5279912	Battle Creek License Surrender	500	500	1,000	**2,000**

Benefits

Battle Creek License is not economic for PG&E's customers, so PG&E is going through the required regulatory process to retire and decommission the associated assets. We have filed a license surrender and this work is now regulatory required and to not complete the project would put PG&E out of compliance and at risk of fines.

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Alternatives Considered

Status Quo: Do nothing – This alternative is not recommended. It is an irreversible FERC regulatory requirement for PG&E to surrender and decommission the Battle Creek Project, if PG&E does not do so PG&E will be out of compliance with FERC.

Alternative 1: Develop and submit to FERC a license surrender application and decommissioning plan - This is the recommended alternative. PG&E is required by FERC to develop and submit to FERC a license surrender application and decommissioning plan for Battle Creek Project.

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Project Summary

Project Title: Bear River Canal – Relocate Ragsdale Racks

Major Work Categories: 2N
Planning Order Numbers: 5793565
Project Start Date: November 2021
Project Completion Date: April 2030
Operative Date (only applies to Capital): September 2029

Project Description

Bear River Canal (BRC) Ragsdale Racks is located off Placer Hills Road, near Meadow Vista, CA. The racks were installed to collect debris to protect downstream infrastructure. The racks are nearing their end of life, and it is becoming more costly to maintain and more difficult to procure replacement parts. Ragsdale Spillway is 1,400 feet upstream from the existing Ragsdale Racks. This distance presents the potential for water to overtop the canal in the vicinity of Ragsdale Spillway resulting in damage to private and county property located downstream from the potential failure point. The risk of overtopping is greater when high water flows and the buildup of debris is present. The current equipment requires personnel to manually clean the racks. This presents a risk to the workers who clear and clean the racks using hand tools during high flow events and inclement weather. The existing trash rack system is manually operated. An automated system will greatly improve operational safety, efficiency and reliability.

Justification

Completion of the project will improve worker safety, improve operational efficiency, reliability and reduce risk of canal overtopping in vicinity of the Ragsdale Spillway resulting in damage to private and county property located downstream from the potential failure point.

Cost

The cost assumptions for this project are based on professional judgment and historic PG&E cost data for similar work.

Major Project Spending Estimates
(Thousands of Nominal Dollars)

CAPITAL

Planning Order	Description	Operative Date	2024 CWIP	2025 Forecast	2026 Forecast	2027 Forecast	2028 Forecast	2029 Forecast	2030 Forecast	CWIP + 2025 - '30 Total
5793565	Bear River Canal – Relocate Ragsdale Racks	September 2029	260	-	57	346	936	2,269		**3,867**

Benefits

Improved reliability and safety for employees. Reduced risk of the intake racks becoming inundated with wooden debris that could lead to an over topping of the canal resulting in in damage to private and county property located downstream from the potential failure point. In addition, this project eliminates the additional future cost increases of maintaining this outdated system because of replacement parts procurement challenges.

Alternatives Considered

Status Quo (Do Nothing) – This alternative is not recommended. This alternative is not preferred given the age and difficulty of procuring replacement parts for the existing asset. In addition, this alternative does not

address the issue of over topping the canal or the future cost increases of maintaining this outdated system because of replacement parts procurement challenges.

Alternative 1: Replace the existing trash rack system with an automated system – This is the recommended alternative. This alternative results in improved reliability and safety for employees and a reduced risk of the intake racks becoming inundated with wooden debris that could lead to an over topping of the canal. As well as reduced expense funding needed to manually clean the racks verses an automated cleaning system.

Alternative 2: Relocate the existing racks – This alternative is not recommended. Since PG&E created the project name, BRC Relocate Ragsdale Racks, it has determined that the best option is Alternative 1, replace existing trash rack system with an automated system. Alternative 2 does not address the safety issue associated with personnel having to manually clean the racks nor the issue associated with the difficulty of procuring replacement parts.

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Project Summary

Project Title: Belden Equipment Life Cycle Replacement

Major Work Categories: 2M
Planning Order Numbers: 5779423, 5798259
Project Start Date: 5779423 – 2020, 5798259 – 2021
Project Completion Date: 5779423 – 2025, 5798259 – 2032
Operative Date (only applies to Capital): 5779423 – December 2025, 5798259 – May 2032

Project Description

Belden Powerhouse (PH) is a 125 MW single-unit powerhouse located on the North Fork of the Feather River. The PH is a semi-outdoor type with a single unit that is equipped with Allis Chalmers Company generator and a vertical Francis turbine. It has a generation capacity of 125 MW.

The Belden Turbine Shutoff Valve (TSV) project will be addressing the ongoing TSV issues by refurbishing the valve, trunnion and upgrading the outdated control system. The refurbishment will address the leakage and restore the TSV to a safe and reliable lock out tag out (LOTO or clearance) point.

The following components will be removed: the draft tube, runner, bottom ring, and the wicket gates. Some of the wicket gate assembly components will be welded repaired and machined while others will be replaced. Then, all of the components will be reinstalled.

Justification

The TSV currently leaks excessively. The Belden TSV has been consistently unreliable as a clearance point for performing work downstream of the TSV such as on the turbine runner. This necessitates dewatering the entire 6 miles of tunnel, plus a 1,100-foot penstock and 1,800 feet of siphon piping upstream of the TSV. This results in a much longer PH outage resulting in excessive power replacement costs to customers.

For the wicket gate bushing and facing plates issue the upper facing plate needs to be replaced and all 24 wicket gates need to be removed and sent to a shop to machine the top surface of the leaf to a flat surface that is uniform across all gates. Then the distance between the upper and lower facing plates needs to be adjusted accordingly. To fix the upthrust issue, a stronger thrust plate needs to be designed and made for all 24 wicket gates, each lever arm needs to be machined accordingly. To fix the adjusting nut/wicket stem galling would be to add a brass washer between the components.

Cost

The cost assumptions for this project are based on professional judgment of the local engineering and hydro team familiar with this type of work.

PACIFIC GAS AND ELECTRIC COMPANY
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Project Summary

Major Project Spending Estimates
(Thousands of Nominal Dollars)

CAPITAL

Planning Order	Description	Operative Date	2024 CWIP	2025 Forecast	2026 Forecast	2027 Forecast	2028 Forecast	2029 Forecast	2030 Forecast	CWIP + 2025 - '30 Total
5779423	Belden PH – Refurbish TSV	December 2025	5,416	3,643						**9,060**
5798259	Belden PH – Replace WG, Bushings, and FPs	May 2032	3,155	-	238	314	325	395	382	**4,808**

Benefits

- Potential avoidance of future O&M expense cost increases associated with maintaining this aging equipment.
- A higher level of power generation reliability resulting from a reduction in forced outages caused by this aging equipment. This results in a replacement power cost savings for customers.

Alternatives Considered

Status Quo: Do nothing – This alternative is not recommended. This alternative assumes that no action is taken other than minimal maintenance until unplanned failure. A very long forced outage would occur until new components could be fabricated and installed resulting in additional costs for expedited work and excessive customer replacement power costs.

Alternative1: Equipment life cycle replacement –This is the recommended alternative. This alternative results in the potential avoidance of future O&M expense cost increases associated with maintaining this aging equipment and a higher level of power generation reliability resulting from a reduction in forced outages caused by this aging equipment. This results in a replacement power cost savings for customers.

Alternative 2: Reschedule One Year – This alternative is not recommended. This alternative assumes the projects are rescheduled by one year. This alternative ultimately has the same long-term benefits as the recommended alternative; however, in the short-term, this alternative is not recommended for the same reasons discussed in status quo.

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Project Summary

Project Title: Bucks Creek Equipment Life Cycle Replacement

Major Work Categories: 2M
Planning Order Numbers: 5747177, 5760038, 5784682, 5800699, 5812253
Project Start Date: Various
Project Completion Date: Various
Operative Date (only applies to Capital): Various; see table below

Project Description

Bucks Creek is a 2-unit, 65 MW powerhouse located on the Feather River. The Bucks Creek powerhouse produces an average of approximately 224 GWh of electricity per year and was commissioned in 1958.

This project is to do life cycle replacement work on Unit 2. This life cycle replacement work includes the following:

- Rewinding the generator refurbishing the field poles, and replacing the stator core iron,
- Replacing the rotor,
- Replacing step-up transformer bank 1-ABC,
- Replacing the step-up transformer bank 1-ABC relay, and
- Replacing the turbine shaft and bearings and installing a bearing oil pre-lube skid.

Justification

These projects will improve the reliability of the Bucks Creek Powerhouse Unit 2. It is no longer feasible to make temporary repairs to these components since they have reached the end of their useful lives.

Replacement of the shaft and bearings is necessary to remove the operating restriction on Unit 2 and restore this unit to its full rated capacity of 32MW. Replacement of the rotor was found to be necessary during a previous reassembly of the unit.

The Unit 2 generator was last rewound in 1990. Recent megger readings and pole drop tests indicate winding deterioration and failure is expected within 3 years.

The generator step-up transformer bank has been in service since 1981 and condition assessments are based on service age, visual inspections, oil analysis and electrical testing. The suggested life expectancy for transformers is 40 years. PG&E has identified this asset as a candidate for replacement given its years of service.

Upgrades to the generator step-up transformer (GSU XFMR) protection are regulatory compliance items that were planned to be completed with the other Unit 2 generator upgrade projects. This project was substantially complete in 2022 but could not be fully tested and returned to service until the other Unit 2 projects were completed. As a result, this project has been on-hold awaiting Unit 2 return to service (currently planned for March 2025).

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Project Summary

Additionally, the stator frame as found conditions were not as anticipated and significant additional repairs for concentricity and circularity were required to ensure current rewind tolerances could be met (stator key bar repairs). The project experienced further delays during installation of the poles when a major issue with the rotor sections was identified- the poles would not slide fully into the rotor keyways due to a misalignment issue between rotor sections. A repair process was undertaken in parallel with an engineering analysis of the rotor. Ultimately it was determined that a repair was not possible due to the age of the rotor, and a full replacement became necessary. An emergent project was created for rotor replacement and a new rotor was designed, forged and machined.

Cost

The cost assumptions for these projects are based on: (a) the professional judgment of the engineers familiar with this type of work; and (b) historic PG&E cost data for similar work.

Major Project Spending Estimates
(Thousands of Nominal Dollars)

CAPITAL

Planning Order	Description	Operative Date	2024 CWIP	2025 Forecast	2026 Forecast	2027 Forecast	2028 Forecast	2029 Forecast	2030 Forecast	CWIP + 2025 - '30 Total
5747177	Bucks Creek PH, U2 – Repl Turbine Brg / Shaft	January 2023	22,286							**22,286**
5760038	Bucks Creek PH, U2 – Rewind Generator	June 2027	14,989							**14,989**
5784682	Bucks Creek – Repl GSU Xfmr 251T Relay NERC	December 2027	2,538							**2,538**
5800699	Bucks Creek PH, U2 – Replace Rotor	December 2024	9,390							**9,390**
5812253	Bucks Creek PH – Replace GSU Xfmr Bank 1	December 2030					183	1,040	1,874	**3,098**

Benefits

- Potential avoidance of future O&M expense cost increases associated with maintaining this aging equipment.
- A higher level of power generation reliability resulting from a reduction in forced outages caused by this aging equipment. This results in a replacement power cost savings for customers.

Alternatives Considered

Status Quo: Do nothing – This alternative is not recommended. This alternative assumes that no action is taken other than minimal maintenance until unplanned bearing, transformer, and/or generator failure. A very long forced outage would occur until new components could be fabricated and installed resulting in additional costs for expedited work and excessive customer replacement power costs.

Alternative1: Complete Life Cycle Replacement Projects –This is the recommended alternative. This alternative results in the potential avoidance of future O&M expense cost increases associated with maintaining this aging equipment and a higher level of power generation reliability resulting from a reduction in forced outages caused by this aging equipment. This results in a replacement power cost savings for customers.

Alternative 2: Reschedule One Year – This alternative assumes the projects are rescheduled by one year. This alternative ultimately has the same long-term benefits as the recommended alternative; however, in the short-term, this alternative is not recommended for the same reasons discussed in the status quo.

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Project Summary

Project Title: Bucks Creek License Conditions

Major Work Categories: 3H, IG
Planning Order Numbers: 5279263, 5279265, 5802310, 5802314, 5802331
Project Start Date: 2022
Project Completion Date: Various
Operative Date (only applies to Capital): Various; see table below

Project Description

Bucks Creek is a two-unit, 65 MW powerhouse located in the Bucks Creek and Upper North Fork Feather River watersheds. The Bucks Creek powerhouse has a normal operating capacity of 65 MW
This relicensing project resulted in the Company obtaining a 50-year Federal Energy Regulatory Commission (FERC) license for the Project, issued June 16, 2022. The forecast cost includes the work necessary to comply with the license conditions and implement the new license. Ongoing work includes compliance and implementation of all license conditions.

Justification

Under the Federal Power Act (FPA), the owner of a hydropower project must obtain a license from FERC to operate its project. At the end of the license term, a licensee may apply to relicense its project. The FPA and FERC's implementing regulations specify a comprehensive and rigorous process a licensee must complete to successfully renew its license. The minimum 5-year regulatory process, which often takes substantially longer to complete, includes extensive stakeholder involvement, performance of comprehensive resource studies and balancing of complex societal and environmental issues. Licensees must be highly engaged with stakeholders and plan relicensing activities prior to the relicensing process beginning with filing of a Notice of Intent and Pre-Application Document and must continue relicensing activities through filing the License Application and subsequent environmental review processes leading to issuance of the new license by FERC. The schedule for issuance of a new license is generally uncertain and can take decades.

The licensee's cost forecasts (capital and expense) for compliance with new license requirements are based on engagement with regulatory agencies and stakeholders during the relicensing proceeding, various environmental reviews (National Environmental Policy Act (NEPA) and California Environmental Quality Act (CEQA)), and regulatory processes and intermediate steps. Cost estimates to implement new license requirements are refined by the licensee throughout the relicensing process based on growing availability of information as the regulatory proceeding matures.

Cost

The cost assumptions for these projects are based on the professional judgment of the engineers and licensing professionals familiar with this type of work and historic PG&E cost data for similar work.

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Project Summary

Major Project Spending Estimates
(Thousands of Nominal Dollars)

CAPITAL/EXPENSE

Planning Order	Description	Operative Date	2024 CWIP	2025 Forecast	2026 Forecast	2027 Forecast	2028 Forecast	2029 Forecast	2030 Forecast	CWIP + 2025 - '30 Total
5802310	Bucks Creek LC – Haskin Valley CG Improvements	October 2028		217	233	307	2,142	42		**2,941**
5802314	Bucks Creek LC – Lower Bucks Lake CG Upgrades	December 2029			156	253	294	2,678	37	**3,418**
5802331	Bucks Creek LC – 3 Lakes Rd 15C Improvements	December 2030				95	186	364	2,897	**3,542**
5279263	Bucks Creek LC – Land Management	n.a.	n.a.	1,400	481		n.a.	n.a.	n.a.	**1,881**
5279265	Bucks Creek – LC Biological Specific	n.a.	n.a.	300	408		n.a.	n.a.	n.a.	**708**

Benefits

The benefits of this project include a new FERC license that authorizes the continued operation of the Bucks Creek powerhouse by 50 years to benefit customers and the general public. Since the license has already been issued by FERC, PG&E is now required to implement the new license requirements.

Alternatives Considered

Status Quo: Do nothing - This alternative is not recommended. Under this alternative, PG&E would stop implementing the new license conditions that were included in the new FERC License that was issued June 16, 2022. This could result in exorbitant fines from FERC and risk PG&E's good standing with FERC.

Alternative 1: Continue to implement the license conditions – This is the recommended alternative. Under this alternative, PG&E customers and the general public would continue to receive all the benefits of the Bucks Creek Project and PG&E would be in compliance with the new FERC License that was issued June 16, 2022.

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Project Summary

Project Title: Bucks Creek Penstock – Upgrade Erosion Protection

Major Work Categories: 2N
Planning Order Numbers: 5792672
Project Start Date: January 2021
Project Completion Date: March 2028
Operative Date (only applies to Capital): June 2027

Project Description

The Bucks Creek Powerhouse (PH) is located on the North Fork of the Feather River and is part of the FERC Bucks - Grizzly Project No. 619. Water is conveyed to the Bucks Creek PH from the Grizzly Forebay via the Grizzly Tunnel and the Bucks Creek Penstocks. The Bucks Creek Penstocks are two steel penstocks that extend from the tunnel portal down a very steep slope about 4,800 feet to Bucks Creek PH. There is ongoing erosion and sedimentation of soil under portions of the penstocks. The steep terrain and limited access points makes annual maintenance and inspection of the penstocks more complex. Given the accumulation of debris along the penstocks it is planned to complete a major debris cleanup, drainage cleaning and stabilization of eroded areas by retaining wall and cementitious blanket slope covers. An evaluation has been completed, and it was determined that strategically placed erosion protection measures and drainage improvements will reduce the soil movement and will reduce the manhours required annually to maintain the penstock slopes.

Additionally, the existing three helicopter pads used to access the site for monthly inspections and maintenance are not to current standards for fall protection and one has been removed from service. This access limitation has made maintenance and inspections more difficult so they will be replaced to current with upgraded safety features will prolong their functional use.

Justification

Initial walk down reports completed by Cotton Shires on June 9, 2017, and Gannett Fleming email report on June 3, 2021, found penstock pier stability issues caused by poor drainage. Erosion and sedimentation along the entire length of the Bucks Creek Penstocks have required extensive maintenance work on the hillside above the Bucks Creek Powerhouse to reduce the concerns of pier stability.

It was identified that permanent improvements to stabilize the hillside along the penstock would reduce the manhours required to maintain the penstock pier stability and therefore the potential injury risk to coworkers performing the work. PG&E's goal of safe and reliable operation of assets by reducing risks in the event of a penstock failure. A penstock failure could lead to an uncontrolled water release that could impact the environment or personnel safety.

Cost

The cost assumptions for this project are based on the professional judgment of the project manager familiar with this type of work and based on construction estimates from internal GC construction crews.

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Project Summary

Major Project Spending Estimates
(Thousands of Nominal Dollars)

CAPITAL

Planning Order	Description	Operative Date	2024 CWIP	2025 Forecast	2026 Forecast	2027 Forecast	2028 Forecast	2029 Forecast	2030 Forecast	CWIP + 2025 - '30 Total
5792672	Bucks Penstock Erosion Protection	June 2027	1,560	-	2,094	3,086				**6,740**

Benefits

The project does not have intrinsic cost savings but provides benefits in the reliability of the system and prevention of uncontrolled water release that could have a significant impact on general safety of the public and PG&E facilities downstream of the dam. An undetected penstock failure could lead to erosion under the penstock which may cause an uncontrolled water release that could impact the environment or personnel safety due to landslides and debris in waterways.

Alternatives Considered

Status Quo: Do nothing - This alternative is not recommended. An undetected penstock failure could lead to erosion under the penstock which may cause an uncontrolled water release that could impact the environment or personnel safety due to landslides and debris in waterways.

Alternative 1: Install Seismic Monitoring and Repair Slope: This alternative is not recommended. Enhance monitoring of slope conditions would occur and plan for additional maintenance beyond existing maintenance plans. This alternative still anticipates that a penstock failure would occur by 2035 and would cause an outage of at least 1 of the Bucks Creek units. An emergent expense repair would need to be planned and executed that could take up to 6 months before the unit could be returned to service.

Alternative 2: Install Erosion Protection System: This is the recommended alternative. This alternative is to perform capital improvements such as rip rap, retaining walls, slope stabilization mats and new helicopter landing pads. These capital improvements will stabilize the identified high priority slope areas and upgrade the existing non-compliant landing pads. Executing this work will reduce the amount of existing annual maintenance and reduce the risk of potential penstock ruptures or failures.

Alternative 3: Replace Helipads: This alternative is not recommended. This alternative assumes that nothing is done except replacing the 3 existing helicopter landing pads. The helicopter pad upgrade is necessary due to compliance concerns of the existing structures. With this option, it is assumed that by 2030 a forced outage of up to 6 months may be required to complete and emergent project to repair the penstock due to slope or penstock footing failure causing leakage or rupture. This forced outage of the 65MW powerhouse would result in up to $5,565K in power generation loss (per current outage calculator) if the forced outage happened in November.

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Project Summary

Project Title: Bucks Creek Powerhouse – Replace Unit 1 Bearings and Shaft

Major Work Categories: 2M
Planning Order Numbers: 5779424
Project Start Date: 2028
Project Completion Date: 2031
Operative Date (only applies to Capital): December 2030

Project Description

Bucks Creek is a 2-unit, 65 MW powerhouse (PH) located on the Feather River. It was commissioned in 1928 and converted to semi-automatic operation in 1958. Water is supplied to the powerhouse through two penstocks which obtain water from Grizzly Forebay. The PH contains two horizontal, double overhung, Pelton turbines each currently designed to produce 32.5MW of power. The Bucks Creek powerhouse produces an average of approximately 224 GWh of electricity per year.

To maintain the reliability of the unit it is recommended to replace the U1 bearings and shaft with a modern design. Similar lifecycle replacement projects were completed for Bucks Creek U2 including turbine bearing and shaft replacement, rotor replacement and a generator rewind.

Justification

It is no longer feasible to make temporary repairs to these components since they have reached the end of their useful lives.

Replacement of the generator bearings and shaft will ensure operational reliability of the unit and include a newly designed and fabricated shaft and bearing set along with upgraded sensors and instrumentation to monitor the operation of the bearings. Modification or replacement of the bearing oil pre-lubrication systems for each of the two bearings will be included and all devices integrated into SCADA.

Installation of new 24” bearings and shaft for U2 was recently completed to correct vibration issues and restore this unit to its full rated capacity of 32MW. Lessons learned from recently completed U2 projects will be implemented for U1.

Cost

The cost assumptions for these projects are based on: (a) the professional judgment of the engineers familiar with this type of work; and (b) historic PG&E cost data for similar work.

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Project Summary

Major Project Spending Estimates
(Thousands of Nominal Dollars)

CAPITAL

Planning Order	Description	Operative Date	2024 CWIP	2025 Forecast	2026 Forecast	2027 Forecast	2028 Forecast	2029 Forecast	2030 Forecast	CWIP + 2025 - '30 Total
5779424	Bucks Creek PH, Unit 1 – Replace Bearings and Shaft	December 2030					138	1,560	2,343	**4,041**

Benefits

- Potential avoidance of future O&M expense cost increases associated with maintaining this aging equipment.
- A higher level of power generation reliability resulting from a reduction in forced outages caused by this aging equipment. This results in a replacement power cost savings for customers.

Alternatives Considered

Status Quo: Do nothing -This alternative is not recommended. This alternative assumes that no action is taken other than minimal maintenance until an unplanned failure of the generator bearings or shaft. A very long forced outage would occur until new components could be fabricated and installed resulting in additional costs for expedited work and replacement power costs for customers.

Alternative1: Replace U1 Bearings and Shaft – This is the recommended alternative. This alternative results in the potential avoidance of future O&M expense cost increases associated with maintaining this aging equipment and a higher level of power generation reliability resulting from a reduction in forced outages caused by this aging equipment. This results in a replacement power cost savings for customers.

Alternative 2: Reschedule One Year – This alternative is not recommended. This alternative assumes the projects are rescheduled by one year. This alternative ultimately has the same long-term benefits as the recommended alternative; however, in the short-term, this alternative is not recommended for the same reasons discussed in status quo.

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Project Summary

Project Title: Caribou Equipment Life Cycle Replacement

Major Work Categories: 2M
Planning Order Numbers: 5720657, 5720659, 5720726, 5734298, 5720727, 5767981, 5797722, 5798518
Project Start Date: Various
Project Completion Date: Various
Operative Date (only applies to Capital): Various; see table below

Project Description

The Caribou 1 & 2 Powerhouses are part of the Upper North Fork Feather River (UNFFR) Project FERC License 2105 and located on the North Fork of the Feather River. Caribou 1 has three turbine-generator units, units 1, 2, and 3, and produces an average of approximately 148 GWh of electricity per year. Caribou 2 Powerhouse has two turbine-generator units, units 4 and 5, with a normal operating capacity of 60 MW per unit. This group of projects consists of turbine, shaft, and bearing replacements, generator rewinds, generator protection upgrades, and governor control upgrades.

The major reliability work proposed for Caribou 1 Powerhouse is to rewind unit 1 and unit 2 generators (unit 3 was rewound in 2007) and replace the existing runners (two runners per unit) on all three units. This powerhouse refurbishment will also include replacing the obsolete excitation system and governors. In addition, other minor powerhouse work will be accomplished during the planned outage to increase the reliability and availability of the unit.

The major reliability work proposed for Caribou 2 Powerhouse includes the rewind of unit 5 and refurbishment of related generator components. Since Caribou 2 Unit 4 was rewound in 2005, a rewind is not required. Unit 5 was last rewound in 1979. The rewind scope includes engineering, manufacturing of coils, disassembly, and installation of rewind coils. On unit 5, PG&E will also be installing new flex cable and associated connectors from Generator Breaker 5/2 to the Switch Generator. Finally, installation of new automation equipment and connections along with new protection equipment will be included consistent with the protection requirements.

Justification

These projects will improve the reliability of the Caribou 1 & 2 Powerhouse. It is no longer feasible to make temporary repairs to these components since they have reached the end of their useful lives.

The current Caribou 1 turbines contain the original 1920-vintage runners which are made of cast steel and require extensive welding repairs to keep the units on-line. After decades of performing welding repairs, the runners' profiles have degraded resulting in reduced performance of the turbines. An engineering analysis was performed on the turbine system and replacement of the runners, bearings and shaft for all three units were all deemed necessary to ensure system performance and long-term reliability.

Caribou 1 Powerhouse Unit 2 was last rewound in the 1960’s and the windings have a history of failure after extended service and operation, putting the reliability of the generators at risk. Additionally, the stator core iron is original to the unit and has exceeded its useful life. Partial Discharge Analysis testing indicates that the windings are in poor condition and trending towards failure. Caribou 2 Powerhouse Unit 5 was last rewound in 1979. PG&E’s Asset Management Generator and Stator Program team identified Caribou 2 Unit 5 as having a high risk of generator winding failure. The age of the generator, the date of last rewind and the class of insulation suggests that the windings may be approaching the end of their useful life.

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Project Summary

The Caribou 1 U2 and Caribou 2 U5 generator protection systems are dated, and it is becoming increasingly difficult to obtain repair parts. Furthermore, the current generator protection schemes are no longer in compliance with PG&E's Generator Protection Standard. The generator protection systems are planned to be upgraded to the most current protection packages offered by SEL and Beckwith as separate but integral parts of the overall unit rewinds.

The existing electronic governor controls for Caribou 1 Unit 2 & Unit 3 were supplied by the GEC Alsthom Company in 1995. Spare parts are no longer available and service for the electronic components is difficult to obtain. The current scope of work is to eliminate the obsolete electronic governor controls and replace them with PLC based governor controls supplied by a hydroelectric generation governor manufacturer with standard application software.

Cost

The cost assumptions for this project are based on professional judgment of the local engineering and hydro team familiar with this type of work.

Major Project Spending Estimates
(Thousands of Nominal Dollars)

CAPITAL

Planning Order	Description	Operative Date	2024 CWIP	2025 Forecast	2026 Forecast	2027 Forecast	2028 Forecast	2029 Forecast	2030 Forecast	CWIP + 2025 - '30 Total
5720657	Caribou 1 PH, Unit 2 Rewind	February 2028	3,280	-	817	9,244	459			**13,799**
5720659	Caribou 2 PH, Unit 5 Rewind	December 2025	23,869	2,502						**26,371**
5720726	Caribou 1 PH, Unit 2 – Replace Runners, Bearings & Shaft	December 2028	6,022	4,234	3,865	13,329	3,874			**31,324**
5720727	Caribou 1 PH, Unit 3 – Replace Runners, Bearings, Shaft & Ndl	December 2030				95	1,147	5,201	7,029	**13,472**
5734298	Caribou 1 PH, Unit 2 – Upgrade Governor Controls	December 2028	224	-	1,009	3,595	734			**5,562**
5767981	Caribou 1 PH, Unit 3 – Upgrade Governor Controls	December 2029	29	-	-	239	1,376	3,121		**4,765**
5797722	Caribou 2 PH, Unit 5 – Upgrade Generator Protection Relays	April 2025	5,833							**5,833**
5798518	Caribou 1 PH, Unit 2 – Upgrade Generator Protection Relays	March 2028			233	3,089	367			**3,689**

Benefits

- Potential avoidance of future O&M expense cost increases associated with maintaining this aging equipment.
- A higher level of power generation reliability resulting from a reduction in forced outages caused by this aging equipment. This results in a replacement power cost savings for customers.

Alternatives Considered

Status Quo – Do nothing – This alternative is not recommended. This alternative assumes that no action is taken other than minimal maintenance until an unplanned turbine, governor, and/or generator failure. A very long forced outage would occur until new components could be fabricated and installed resulting in additional costs for expedited work and excessive customer replacement power costs.

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Alternative1: Complete Reliability Projects –This is the recommended alternative. This alternative results in the potential avoidance of future O&M expense cost increases associated with maintaining this aging equipment and a higher level of power generation reliability resulting from a reduction in forced outages caused by this aging equipment. This results in a replacement power cost savings for customers.

Alternative 2: Reschedule One Year – This alternative is not recommended. This alternative assumes the projects are rescheduled by one year. This alternative ultimately has the same long-term benefits as the recommended alternative; however, in the short-term, this alternative is not recommended for the same reasons discussed in status quo.

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Project Summary

Project Title: Conveyance Improvements

Major Work Categories: 2N, 2P, KH
Planning Order Numbers: Capital – 5778990, 5779209, 5793564, 5801336, 5804179, 5811074, 5812025, 5812065, 5812026, 5812088; Expense – 5287186
Project Start Date: Various
Project Completion Date: Various
Operative Date (only applies to Capital): Various; see table below

Project Description

Drum Annual Canal Liner Improvements- The canal liner has deteriorated. Deterioration includes physical damage to the liner, cracking, holes, hazard tree-root encroachment, seepage under the existing liner, slope movement impacts, and other erosional impacts. This project will identify priority locations, design, and construct canal improvement to reduce risk to public safety and improve canal reliability. Deteriorated areas will be removed, new rebar will be set in place then a shotcrete material will be sprayed.

Lake Valley Canal Convert to Pipe – Lake Valley Canal is a gunite-lined open ditch that has to be taken out of service during the winter months due to the snow impact on water flows. This project will replace 1.1 miles of open gunite ditch with HDPE piping. This will allow for reliable water delivery throughout the year.

Helms Install Concrete Tunnel Liner – During the Helms Unit 3 outage an inspection was performed on the incline tunnel. It was found that portions of the original liner are missing and failing. This project will seek to restore the liner function to its original condition by relining sections of the incline tunnel as well as install additional improvements to address tunnel integrity and leakage concerns.

Bear River Canal Instrumentation Upgrade – This section of canal is in a high-risk area with exposure to the public ranging from recreational to private. This project will replace existing instrumentation that measures water flow and height, improve remote monitoring capability and explore automation opportunities to improve incident detection and response if the canal over tops due to storm inflows or downed vegetation.

Bear River Canal Replace Liner – The canal liner has deteriorated. Deterioration includes physical damage to the liner cracking, holes, hazard tree-root encroachment, seepage under the existing liner, slope movement impacts, and other erosional impacts. This project will identify priority locations, design, and construct canal improvement to reduce risk to public safety and improve canal reliability. Deteriorated areas will be removed, new rebar will be set in place then a shotcrete material will be sprayed.

Hendricks Canal Lining Improvements - The canal liner has deteriorated. Deterioration includes physical damage to the liner cracking, holes, hazard tree-root encroachment, seepage under the existing liner, slope movement impacts, and other erosional impacts. This project will identify priority locations, design, and construct canal improvement to reduce risk to public safety and improve canal reliability. Deteriorated areas will be removed, new rebar will be set in place then a shotcrete material will be sprayed.
Main Tuolumne Canal Intake Pipe Replace – The Main Tuolumne Conveyance is approximately 15.4 miles long and serves to convey water from Lyons Dam (via the Cushion Dam) to the Phoenix Powerhouse header box. The conveyance is made up of multiple sections including box flume, half pipe flume, gunite lined and unlined canal sections. The conveyance begins with an inlet pipe (~36” diameter) which ties into the Cushion Dam and is controlled with a manually operated slide gate, protected by a trash rack. The intake pipe to the

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Main Tuolumne Canal (MTC) is riddled with leaks and is subject to imminent failure. This project will replace approximately 360 feet of steel pipe from the Lyons cushion dam to S17, the start of A Flume on the MTC. Replacement includes the addition of at least one thrust block and various saddle improvements.

Main Tuolumne Canal Liner and Flume Liner Replacements – The canal liner has deteriorated. Deterioration includes physical damage to the liner cracking, holes, hazard tree-root encroachment, seepage under the existing liner, slope movement impacts, and other erosional impacts. This project will identify priority locations, design, and construct canal improvement to reduce risk to public safety and improve canal reliability. Deteriorated areas will be removed, new rebar will be set in place then a shotcrete material will be sprayed. Flume Sheets along the Main Tuolumne Canal have exceeded their useful life and have begun to leak, compromising the integrity of the foundations. It is recommended to install a polyurethane flume liner to extend the life of the existing steel sheets that are worn thin and require replacement. The new Polibrid 705 polyurethane liner will arrest the wear along the invert, seal leaks through the joints, and extend the life of the remaining flume sheets an expected 15 years or more.

Tiger Creek Canal Liner and Flume Liner Replacements – The canal liner has deteriorated. Deterioration includes physical damage to the liner cracking, holes, hazard tree-root encroachment, seepage under the existing liner, slope movement impacts, and other erosional impacts. This project will identify priority locations, design, and construct canal improvement to reduce risk to public safety and improve canal reliability. Deteriorated areas will be removed, new rebar will be set in place then a shotcrete material will be sprayed. Flume Sheets along the Main Tuolumne Canal have exceeded their useful life and have begun to leak, compromising the integrity of the foundations. It is recommended that to install a polyurethane flume liner to extend the life of the existing steel sheets that are worn thin and require replacement. The new Polibrid 705 polyurethane liner will arrest the wear along the invert, seal leaks through the joints, and extend the life of the remaining flume sheets an expected 15 years or more.

Hat Creek 1 Refurbish Canal and Embankment- The canal liner has deteriorated. Deterioration includes physical damage to the liner cracking, holes, hazard tree-root encroachment, seepage under the existing liner, slope movement impacts, and other erosional impacts. This project will identify priority locations, design, and construct canal improvement to reduce risk to public safety and improve canal reliability. Deteriorated areas will be removed, new rebar will be set in place then a shotcrete material will be sprayed. Engineered backfill on the embankment side of the canal to ensure further erosion mitigation caused by storms or rodent activities.

Civil Infrastructure Maintenance Programs address contract costs for inspections, surveys, and studies on conveyance and appurtenant structures not prescribed by programmatic guidelines to monitor and scope small scale repair projects beyond the capabilities of maintenance staff.

Justification

These projects maintain public safety and prevent harm to environmental resources. These projects mitigate the risk of water conveyance system failure and water delivery failure. These failures can have environmental impacts due to inundation of nesting areas as well as public safety risks and damage to private and public property located near the waterways.

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Cost

The cost assumptions for this project are based on professional judgment and historic PG&E cost data for similar work.

Major Project Spending Estimates
(Thousands of Nominal Dollars)

CAPITAL/EXPENSE

Planning Order	Description	Operative Date	2024 CWIP	2025 Forecast	2026 Forecast	2027 Forecast	2028 Forecast	2029 Forecast	2030 Forecast	CWIP + 2025 - '30 Total
5779209	Helms – Install Incline Tunnel Liner	December 2025	8,814	433						**9,248**
5793564	Drum Annual Canal Liner Improvements 2026	November 2028					2,752	31		**2,784**
5801336	Hat Creek 1 – Refurbish Canal and Embankment	December 2025	278	3,734						**4,012**
5804179	Main Tuolumne Canal – Replace Intake Pipe	October 2028	29	-	194	257	2,294			**2,774**
5811074	Hendricks Canal – Liner Improvements	December 2032				2,054	1,835	2,080	1,874	**7,844**
5812025	Annual Canal Liner Improvements 2029	November 2029						3,121	28	**3,149**
5812026	Annual Canal Liner Improvements 2030	October 2031							2,811	**2,811**
5812065	Bear River Canal – Replace Liner	January 2030							2,999	**2,999**
5812088	Bear River Canal – Instrumentation Upgrade	October 2030					229	2,080	1,874	**4,184**
5778990	Lake Valley Canal – Convert to Pipe	October 2033					321	520	3,280	**4,121**
5287186	Civil Infrastructure Maintenance Program	n.a.	n.a.			4,000	n.a.	n.a.	n.a.	**4,000**

Benefits

- Reduction in public safety risks and damage to private and public property located near the waterways;
- The avoidance of future O&M expense cost increases associated with maintaining this aging equipment;
- A higher level of power generation reliability will be realized resulting from a reduction in forced outages caused by this aging equipment. This results in replacement power cost savings for customers; and
- Reliable delivery of water to agencies PG&E is contractually obligated to provide water to.

Alternatives Considered

Specific scope details are site specific and will be chosen based on what is the safest and most cost effective for the customer.

Status Quo (Do Nothing) - This alternative is not recommended. This alternative does not address the public safety risks and damage to private and public property located near the waterways. This alternative also does not avoid future O&M expense cost increases associated with maintaining this aging equipment. This alternative results in forced outages caused by this aging equipment and subsequent replacement power costs for customers. This alternative also does not address the need for reliable delivery of water to agencies PG&E is contractually obligated to provide water to.

Alternative 1: Repair existing structures – This alternative is not recommended. This alternative results in O&M

expense cost increases associated with maintaining this aging equipment. Repairing existing structures is not sustainable.

Alternative 2: Replacement with in-kind structures – This alternative is recommended for assets like canals and flumes where the design and materials are standard throughout the system. This alternative saves costs for the customer as standard designs and materials are readily available. This alternative addresses the public safety risks and damage to private and public property located near the waterways. This alternative results in the avoidance of future O&M expense cost increases associated with maintaining this aging equipment. In addition, a higher level of power generation reliability will be realized resulting from a reduction in forced outages caused by this aging equipment. This results in replacement power cost savings for customers. Additional benefits include the continued reliable delivery of water to agencies PG&E is contractually obligated to provide water to.

Alternative 3: Replacement with improved structure – This alternative is recommended for those assets that have failed due to faulty design, or a change in condition prompting a new design catered to that requirement. This could be requirements like higher instream flows that the current design cannot accommodate. Or a design that is no longer efficient or reliable when conveying water. This alternative addresses the public safety risks and damage to private and public property located near the waterways. This alternative results in the avoidance of future O&M expense cost increases associated with maintaining this aging equipment. In addition, a higher level of power generation reliability will be realized resulting from a reduction in forced outages caused by this aging equipment. This results in replacement power cost savings for customers. Additional benefits include the continued reliable delivery of water to agencies PG&E is contractually obligated to provide water to.

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Project Summary

Project Title: Crane Valley Recreation Facilities Settlement Agreement

Major Work Categories: 3H
Planning Order Numbers: 5798915
Project Start Date: 2022
Project Completion Date: 2030
Operative Date (only applies to Capital): December 2029

Project Description

Recreation infrastructure project, mandated by FERC by an agreement between PG&E and the Sierra National Forest (SNF) regarding the rehabilitation of various recreation facilities in the vicinity of Bass Lake, California, occupying SNF lands which are administered by the Forest Service. The forecast cost includes the work necessary to comply with the license conditions and remain in compliance with the FERC license. Ongoing work includes compliance and implementation of all license conditions.

Justification

Crane Valley Group Campground, Recreation Point Day Use and Campground, Pine Point, Rocky Point, Pine Slope Day Use, Wishon Point Campground, Bass Lake Recreation Office and Amphitheater, Lupine-Cedar Campground, Willow Cove Day Use, and Wishon Day Use and Boat Ramp remain to be rehabilitated. Renovations and enhancements to these facilities are required per a 2003 agreement between PG&E and the United States Forest Service (USFS) to be rehabilitated to repair defects that could affect the health and safety of visitors; maintain or restore infrastructure such as roads and barriers to current engineering standards appropriate to Development, as appropriate; repair or replace, as necessary, utility systems such as sewer and water lines (including the water system commonly referred to as the Bass Lake Recreation Water System, which serves the recreation facilities between the Wishon Boat Launch west to the Lakeside Picnic Site. This system includes, but is not limited to, three water wells; two holding tanks and a system of distribution water lines); repair or replace, as necessary toilets, hydrants, bulletin boards, and other fixtures necessary and customary for Development of recreation sites.

Improvements may include installing showers with the inclusion of sewer, water, and electrical hookups at each individual trailer pad. These improvements will be designed and constructed to be accessible to persons of all abilities pursuant to the Americans with Disabilities Act of 1990. The scope and development scale of improvements at a particular recreation facility may be reduced by mutual agreement of the Forest Service and Licensee to reduce the cost and accelerate implementation if the Forest Service does not have a source for providing cooperative funding.

Cost

The cost assumptions for these projects are based on on-going scoping negotiations with the USFS as well as the professional judgment of the engineers and licensing professionals familiar with this type of work and historic PG&E cost data for similar work.

Major Project Spending Estimates
(Thousands of Nominal Dollars)

CAPITAL

Planning Order	Description	Operative Date	CWIP 2024	2025 Forecast	2026 Forecast	2027 Forecast	2028 Forecast	2029 Forecast	2030 Forecast	CWIP + 2025 - '30 Forecast
5798915	Crane Valley Recreation Facilities Settlement Agreement	December 2029	10	2,717	3,602	2,568	2,294	1,845	469	**13,505**

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Benefits

The benefits of this project include authorization from FERC for the continued operation of the Crane Valley Project to benefit customers and the public by providing clean energy. In addition to power generation benefits, Bass Lake provides considerable economic benefits to and recreational opportunities in eastern Madera County. Since the license has already been issued by FERC, PG&E is mandated to implement the license requirements.

Alternatives Considered

No Action - This alternative is not recommended. Selecting this alternative, PG&E would break an agreement with the United States Forest Service (USFS) that was included into the FERC License, issued September 16, 2003. This could result in excessive fines from FERC and risk PG&E's good standing with the public, USFS, and FERC.

Alternative 1: Continue to implement the license conditions – This is the recommended alternative. Under this alternative, PG&E customers and the public would continue to receive all the benefits of the Crane Valley Project recreation resources and PG&E would remain in compliance with the FERC License that was issued September 16, 2003.

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Project Summary

Project Title: Cresta Equipment Life Cycle Replacement

Major Work Categories: 2M
Planning Order Numbers: 5760167, 5760652, 5781162, 5805941, 5806386
Project Start Date: Various
Project Completion Date: Various
Operative Date (only applies to Capital): Various; see table below

Project Description

Cresta Powerhouse (PH) is part of the Rock Creek-Cresta Project FERC License 1962 and is located in Butte County, California on the North Fork of the Feather River. Cresta PH has two units that were originally commissioned in 1949 and 1950 respectively. The General Electric generators have a normal operating capacity of 35.0 MW for a total plant capacity of 70.0 MW. The turbines are of the vertical Francis type, originally supplied by Pelton. Each generator has a shaft-driven exciter rated for 300 KW, 250 volts, the output of which is directly connected to the generator field.

Cresta PH Replace Exciter U1 & U2 (5760652 & 5760167): The Cresta exciters are original equipment to the powerhouse and are now obsolete. Spares and repair parts for the existing excitation systems are no longer available. Replacement of the obsolete mechanical exciter systems with modern static-type exciters will update the equipment to current standards and restore reliability.

Cresta PH U2 Rewind (5781162): Asset Management's Generator and Stator Program has identified Cresta U2 as having a high risk of generator winding failure. The age of the generator, the date of the last rewind and class of insulation suggests that the windings may be approaching the end of their useful life. The unit was last rewound in 1990, and a rewind is necessary to continue stable and reliable operation.

Cresta PH U1 Upgrade Turbine (5805941): The Cresta U1 Turbine has been identified as a priority for replacement within the Asset Management turbine program. The existing turbine has exceeded its design life and needs replacement. Inspection reports between 2021 and 2023 indicated diminishing integrity of the existing turbine. The turbine is no longer responding well to repairs and requires replacement.

Cresta PH Replace GSU Transformer Bank 1 (5806386): Cresta PH U1 and U2 feed one generator step-up (GSU) transformer bank consisting of three single-phase transformers and a spare. The transformers were refurbished in 2019 to extend their life until a replacement could be initiated. Testing of the transformers since the refurbishment indicate continued degradation. The transformers are beyond their life expectancy. Replacement of the bank is warranted given the equipment age and conditions.

Justification

Cresta PH Replace Exciter U1 & U2: Due to age and obsolescence of the Cresta Powerhouse excitation systems replacement is required. The exciters will be the same units installed at five other powerhouses in the DeSabla watershed. This will streamline maintenance and improve compatibility across the exciter fleet reducing spares required.

Cresta PH U2 Rewind: The objective of this rewind is to improve unit reliability, extend generator life and avoid unplanned outages related to an in-service failure of the windings.

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Cresta PH U1 Upgrade Turbine: Replacement of the turbine will reduce the risk of equipment failure resulting in unplanned outages.

Cresta PH Replace GSU Transformer Bank 1: Due to age and continued degradation of the equipment post refurbishment, replacement of the bank is necessary to reduce risk of failure. Failure of the bank would halt the supply of power to the grid from both Cresta U1 and U2.

Cost

The cost assumptions for this project are based on professional judgment of the local engineering and hydro team familiar with this type of work.

Major Project Spending Estimates
(Thousands of Nominal Dollars)

CAPITAL

Planning Order	Description	Operative Date	2024 CWIP	2025 Forecast	2026 Forecast	2027 Forecast	2028 Forecast	2029 Forecast	2030 Forecast	CWIP + 2025 - '30 Total
5760167	Cresta PH, Unit 1 – Replace Excited	October 2028	204	808	1,453	2,794	306	46		**5,611**
5760652	Cresta PH, Unit 2 – Replace Exciter	December 2030	441	844	1,506	3,003	340	414	49	**6,598**
5781162	Cresta PH – Unit 2 Rewind	December 2031	3,359	-	-	-	-	125	9,372	**12,855**
5805941	Cresta PH, Unit 1 – Upgrade Turbine	December 2031	174	-	155	476	1,647	1,867	3,550	**7,868**
5806386	Cresta PH – Replace GSU Xfmr Bank	October 2029	189	-	2,179	1,356	1,455	3,262		**8,441**

Benefits

- Potential avoidance of future O&M expense cost increases associated with maintaining this aging equipment.
- Potential avoidance of a very long forced outage until new components could be fabricated and installed resulting in additional costs for expedited work.
- A higher level of power generation reliability resulting from a reduction in forced outages caused by this aging equipment. This results in a replacement power cost savings for customers.

Alternatives Considered

Status Quo: Do nothing. Run to failure – This alternative is not recommended. This alternative assumes that no action is taken other than minimal maintenance until an unplanned equipment failure. A very long forced outage would occur until new components could be fabricated and installed resulting in additional costs for expedited work and excessive customer replacement power costs.

Alternative1: Equipment life cycle replacement –This is the recommended alternative. This alternative results in the potential avoidance of future O&M expense cost increases associated with maintaining this aging equipment and a higher level of power generation reliability resulting from a reduction in forced outages caused by this aging equipment. This results in a replacement power cost savings for customers.

Alternative 2: Reschedule One Year – This alternative is not recommended. This alternative assumes the

projects are rescheduled by one year. This alternative ultimately has the same long-term benefits as the recommended alternative; however, in the short-term, this alternative is not recommended for the same reasons discussed in status quo.

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Project Summary

Project Title: Cresta Powerhouse Crane Upgrade

Major Work Categories: 2M
Planning Order Numbers: 5760650
Project Start Date: March 2017
Project Completion Date: June 2028
Operative Date (only applies to Capital): June 2027

Project Description

The Cresta Powerhouse has two units that were originally commissioned in 1949 and 1950. Each unit has a normal operating capacity of 35.0 MW for a total plant capacity of 70.0 MW. The turbines are of the vertical Francis type, originally supplied by Pelton. The generators were originally designed to be lifted with two 110-ton capacity bridge cranes operated in tandem with a single generator lifting beam. This arrangement was used when the powerhouse was constructed. After construction, one of the two bridge cranes was relocated to Rock Creek Powerhouse, and then relocated elsewhere, and will not be returned to Cresta.

Justification

The current crane's outdated technology hinders efficient operation, resulting in productivity challenges and potential safety hazards. A refurbished crane will enhance operational efficiency, meet safety standards, and support crane-dependent projects effectively. Deferring this project could lead to continued inefficiencies and increased safety risks, including potential hazards from unwinding spools.
The recommended refurbishment approach balances cost-effectiveness with achieving project objectives, making it a more practical alternative compared to complete replacement. Modernizing the crane will ensure reliability and long-term usability while addressing safety concerns and improving project workflows.

Cost

The cost assumptions for this project are based on: (a) the professional judgment of the engineers familiar with this type of work; and (b) historic PG&E cost data for similar work.

Major Project Spending Estimates
(Thousands of Nominal Dollars)

CAPITAL

Planning Order	Description	Operative Date	2024 CWIP	2025 Forecast	2026 Forecast	2027 Forecast	2028 Forecast	2029 Forecast	2030 Forecast	CWIP + 2025 - '30 Total
576065	Cresta PH – Crane Upgrade	June 2027	1,448	-	3,512	6,176				**11,137**

Benefits

- Potential avoidance of future O&M expense cost increases associated with maintaining this aging equipment.
- A higher level of power generation reliability resulting from a reduction in forced outages caused by this aging equipment. This results in replacement power cost savings for customers.
- Increased productivity for crane-dependent projects.
- By incorporating modern control systems and mechanical upgrades, the project ensures compliance with current safety standards while extending the crane's lifespan.

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Alternatives Considered

Status Quo: Do nothing – This alternative is not recommended. Attempting to maintain the existing crane will result in future O&M expense cost increases associated with maintaining this aging equipment; an increase in forced outages resulting in replacement power costs to customers; safety risks; and no improvement in productivity for crane-dependent projects.

Alternative 1: Replacement- This alternative is not recommended. While replacing the crane has the same benefits as the proposed project, it is less cost-effective due to the higher capital costs.

Alternative 2: Refurbishment- This alternative is the recommended solution as it realizes all the above benefits at the lowest capital cost.

Alternative 3: Repair- This alternative is not recommended. This alternative is essentially the same as the status quo alternative.

Alternative 4: Retirement- This alternative is not recommended. The crane is required to continue to maintain the powerhouse. This alternative would lead to the shutdown of the powerhouse because PG&E would no longer be able to maintain it. This alternative would not be in the best interests of the customer.

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Project Summary

Project Title: Dam Safety Program – Inundation Maps

Major Work Categories: IG
Planning Order Numbers: 5272077
Project Start Date: 2020
Project Completion Date: Non-Earnings Expense – n.a.
Operative Date (only applies to Capital): Non-Earnings Expense – n.a.

Project Description

The required work scope is to submit inundation mapping and supporting technical studies for all PG&E dams classified as extremely high, high, and significant hazard by DSOD and associated CASs. State criteria is different from FERC regulation and requires updates to meet criteria established by emergency regulations dated October 19, 2017. The program develops inundation maps and supports technical studies for all PG&E dams classified by DSOD as extremely high hazard, high hazard and significant hazard. With the increased Hydraulics & Hydrology workload and from the results of the focused spillway assessments, and additional risk analysis, a dedicated resource needs to be added to the program. The H&H SME is over capacity supporting all the various spillway capital projects as a dam safety stakeholder, as well as supporting H&H items that are follow-ups from Part 12 recommendations.

Justification

PG&E is responsible for completing dam breach inundation mapping required by the state of California as result of the 2017 Oroville Dam incident. The California State Legislature amended the water code (2017 SB92) requiring inundation maps for non-low hazard dams and associated critical appurtenant structures (CASs). Emergency regulations from the DSOD, effective October 19, 2017, provides criteria for maps and supporting technical studies.

Additionally, this project is foundational in managing the Large Uncontrolled Water Release (LGUWR) risk. More specifically, these projects are part of the Dam Safety Program (LGUWR-F001– Dam Safety Program) foundational projects.

The Commission defines foundational programs and/or activities as initiatives that support or enable two or more mitigation programs or two or more risks but do not directly reduce the consequences or the likelihood of risk events. Per D.21-11-009, CBRs for foundational activities are not required. However, forecast costs of foundational activities must be included in the CBR calculations for the control and mitigation programs that the foundational activities enable, subject to minimum cost thresholds. For more information please see PG&E's 2024 RAMP, Exhibit (PG&E-2), Ch. 2, Section 4.g.

Cost

The cost assumptions for this project are based on the professional judgment of the engineers and licensing professionals familiar with this type of work and historic PG&E cost data for similar work.

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Major Project Spending Estimates
(Thousands of Nominal Dollars)

NON-EARNINGS EXPENSE

Planning Order	Description	CBR	2025 Forecast	2026 Forecast	2027 Forecast	2025 - '27 Total
5272077	Dam Safety Program – Inundation Maps	Foundational	500	500	3,000	**4,000**

Benefits

This project identifies the safety concerns downstream if there is a failure of a non-low hazard dam, with these maps we provide key information to the public in the creation of emergency action plans.

Alternatives Considered

Status Quo: Remove inundation map funding – This alternative is not recommended. This alternative results in higher safety risk in the instance of a dam failure.

Alternative 1: Continue to Establish Annual Inundation Map Funds – This is the recommended alternative. This alternative provides funding for developing inundation maps and supporting technical studies to continue risk reduction to the communities down stream of PG&E.

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Project Summary

Project Title: Dam Seismic Improvements (Belden, Caribou 1 & 2 Intakes)

Major Work Categories: 2N, 2L
Planning Order Numbers: 5802878, 5812287, 5806840
Project Start Date: 2026, 2027, 2025
Project Completion Date: 2030, 2031, 2028
Operative Date (only applies to Capital): 2030, 2030, 2028

Project Description

Belden Forebay Dam and Butt Valley Dam are part of the Upper North Fork Feather River (UNFFR) Project FERC License 2105 and are located on the North Fork of the Feather River in Plumas County, CA. The Belden Intake leads to Belden Powerhouse (PH), a one-unit, 125 MW powerhouse which produces an average of 349 GWh of electricity per year.

The Caribou 1 and 2 Intake Towers are located in the Butt Valley Reservoir, and lead to the Caribou 1 and Caribou 2 Powerhouses. The two power tunnels and intakes have full-height, freestanding, gate towers upstream of the right abutment of the dam. They convey water to Caribou Powerhouses No. 1 and No. 2. Caribou 1 has three turbine-generator units with a total rating capacity of 75MW and produces an average of approximately 148 GWh of electricity per year. Caribou 2 Powerhouse has two turbine-generator units with a normal operating capacity of 60 MW per unit.

These three projects will complete seismic improvements to the Belden Intake Structure and Caribou 1 & Intake Towers to improve dam safety. Driven by Federal Energy Regulatory Commission (FERC) 2015 Part 12 recommendations, the specific seismic improvements will be determined following further studies and a formal engineering analysis of alternatives.

Justification

The power tunnels leading to Caribou 1 PH and Caribou 2 PH are located at the south end of Butt Valley Reservoir, 16 miles NW of Quincy, CA. Further analysis to determine seismic improvements to the power tunnel intake towers were recommended in the 2015 FERC Part 12D report for Butt Valley Dam. The initial seismic analysis has been completed, and a formal engineering analysis of alternatives will determine retrofits needed to maintain structural integrity of the intake tower and operation of the gates during a major seismic event. The intake tower must stay operational and withstand seismic events to avoid uncontrolled release of water from the reservoir. An uncontrolled release of water would cause environmental and property damage and risk to public safety.

Belden Intake seismic improvements are driven by the 10th FERC Part 12D safety inspection report, documented via Recommendation 7 – to modify the intake gate hoist frame and anchorage to meet the expected seismic demands (PFM 11-Seismic Loading). The power tunnel intake gate must stay operational and withstand seismic events to avoid uncontrolled release of water from the reservoir. An uncontrolled release of water would cause environmental and property damage and risk to public safety.

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Cost

The cost assumptions for this project are based on professional judgement of the local engineering and hydro team familiar with this type of work. The costs are subject to change pending completion of a formal engineering analysis of alternatives.

Major Project Spending Estimates
(Thousands of Nominal Dollars)

CAPITAL

Planning Order	Description	Operative Date	2024 CWIP	2025 Forecast	2026 Forecast	2027 Forecast	2028 Forecast	2029 Forecast	2030 Forecast	CWIP + 2025 - '30 Total
5802878	Belden Intake Structure – Seismic Improvements	December 2031	38	-	82	238	275	312	4,686	**5,631**
5812287	Caribou 1 Intake Structure – Seismic Improvements	December 2031				95	138	520	5,623	**6,376**
5806840	Caribou 2 Intake Structure – Seismic Improvements	December 2028	17	-	230	285	4,587			**5,120**

Benefits

- Increased seismic stability of intake structures lowering risk of uncontrolled water release in the event of a seismic event.
- A higher level of power generation reliability will be realized resulting from a reduction in forced outages caused by seismic events. This results in replacement power cost savings for customers.
- The cost of the proposed projects would likely be much less than the cost to return the powerhouses to service after a failure due to a seismic event.

Alternatives Considered

Status Quo – Do nothing. This alternative is not recommended. This alternative does not address the public safety risks and damage to private and public property located near the waterways. This alternative assumes that no action is taken other than minimal maintenance and continued inspections until unexpected failure due to a seismic event. Uncontrolled water release could result if gate damage occurs during a seismic event. The cost to return the powerhouses to service after a failure due to a seismic event would likely be much higher than the cost of the proposed projects.

Alternative 1: Complete Seismic Improvement Projects –This is the recommended alternative. This alternative increases the seismic stability of the intake structures resulting in a reduced risk of uncontrolled water release in the event of a seismic event. In addition, a higher level of power generation reliability will be realized resulting from a reduction in forced outages caused by seismic events resulting in replacement power cost savings for customers.

Alternative 2: Reschedule One Year – This alternative assumes the projects are rescheduled for one year. This alternative ultimately has the same long-term benefits as the recommended alternative; however, in the short-term, this alternative is not recommended for the risks discussed in Status Quo alternative.

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Project Summary

Project Title: DeSabla-Centerville Relicensing and/or License Conditions

Major Work Categories: 3H
Planning Order Numbers: 5812234
Project Start Date: 2022
Project Completion Date: 2033
Operative Date (only applies to Capital): December 2032

Project Description

DeSabla-Centerville Project includes three powerhouses located on the West Branch of the Feather River (WBFR), and Butte Creek watersheds. Together, Toadtown, DeSabla and Centerville powerhouses produce an average of about 149 GWh of electricity per year.
PG&E began the relicensing process for DeSabla-Centerville in 2004.

Justification

The current Project license expired in 2009 and currently operates under an annually renewing license. Under the Federal Power Act (FPA), the owner of a hydropower project must obtain a license from FERC to operate. At the end of the license term, a licensee may apply to relicense its project. The FPA and FERC's implementing regulations specify a comprehensive and rigorous process a licensee must complete to successfully renew its license. The minimum 5-year duration collaborative process includes extensive stakeholder involvement, performance of comprehensive natural resource studies, and balancing of complex societal and environmental issues. Failure to operate the Project in compliance with the FERC License subjects the Licensee to fines of up to $10,000 per day and loss of the License.
The DeSabla Centerville relicensing costs were also forecast in the 2017 GRC. Relicensing costs have accrued because PG&E began the relicensing process for DeSabla-Centerville in 2004 before the licensing process was placed on hold in 2017 as PG&E attempted to divest of the Project. In 2022, PG&E notified FERC that negotiations with the prospective buyer had been mutually terminated, and that PG&E would continue with the licensing process. This project is subject to balancing account treatment.

Cost

The cost assumptions for this project are based on the professional judgment of project managers and engineers familiar with this type of work and historic PG&E cost data for similar work.

The new FERC License Conditions are uncertain until the license is issued by FERC; however, the cost forecasts are based study results and discussions held with the regulatory agencies and stakeholders throughout the relicensing process, and on the Company's experience with implementing recent similar License conditions.

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Major Project Spending Estimates
(Thousands of Nominal Dollars)

CAPITAL

Planning Order	Description	Operative Date	2024 CWIP	2025 Forecast	2026 Forecast	2027 Forecast	2028 Forecast	2029 Forecast	2030 Forecast	CWIP + 2025 - '30 Total
5812234	DeSabla Licensing Conditions – Capital	December 2030			269	988	4,505	9,262	8,553	**23,606**

Benefits

The benefit of this project is a new FERC license for Toadtown, DeSabla and Centerville powerhouses by 30-50 years so that PG&E can continue to operate these powerhouses to benefit customers and the general public.

Alternatives Considered

Status Quo: Do nothing - This alternative is not recommended. Under this alternative, PG&E would simply abandon the FERC licensing process that has already begun. The result of which would be PG&E's current FERC license not being renewed, and PG&E would not be able to continue operating the Toadtown, DeSabla and Centerville powerhouses. If PG&E would choose to continue to operate, exorbitant fines from FERC would be incurred and potentially risking PG&E's good standing with FERC.

Alternative 1: Continue to license the DeSabla-Centerville Project and plan to implement the license conditions – This is the recommended alternative. Under this alternative, PG&E customers and the general public would continue to receive all the benefits of the DeSabla-Centerville Project.

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Project Summary

Project Title: DeSabla Powerhouse – Stator Rewind & Rotor Refurbishment

Major Work Categories: 2M
Planning Order Numbers: 5747208
Project Start Date: 2027
Project Completion Date: 2031
Operative Date (only applies to Capital): May 2030

Project Description

The DeSabla Powerhouse is a one-unit, 12 MW powerhouse located on the Butte Creek in Butte County. The DeSabla Powerhouse produces an average of approximately 82 GWH of electricity per year. The Powerhouse, commissioned in 1963, is comprised of a single horizontal impulse (Pelton) turbine coupled with a General Electric (GE) generator.

The purpose of this project is to rewind the generator stator and refurbish the rotor field poles to restore generator reliability.

Justification

The justification for this project is reliability. The stator windings and field poles are original from 1963 and have exceeded their expected service life. The stator winding insulation is aged and a rotor pole inspection in 2024 revealed poor insulation resistance values across all poles. Rewind of this generator will reduce the risk of failure in service and improve the reliability of power generation.

Cost

The cost assumptions for this project are based on: (a) the professional judgment of the engineers familiar with this type of work; and (b) historic PG&E cost data for similar work.

Major Project Spending Estimates
(Thousands of Nominal Dollars)

CAPITAL

Planning Order	Description	Operative Date	2024 CWIP	2025 Forecast	2026 Forecast	2027 Forecast	2028 Forecast	2029 Forecast	2030 Forecast	CWIP + 2025 - '30 Total
5747208	DeSabla – Rewind Generator	May 2030				119	2,752	3,121	4,686	**10,678**

Benefits

Benefits improvement in reliability resulting from a reduction in forced outages caused by this aging equipment. This results in replacement power cost savings for customers. Benefits also include the avoidance of future O&M expense cost increases associated with maintenance of these aging assets.

Alternatives Considered

Status Quo: Do Nothing – Running the generator until it fails would result in a prolonged forced outage (a minimum of two years). This results in a replacement power costs for customers. This alternative also results in higher capital costs to rewind the generator stator and refurbish the rotor field poles on an expedited basis.

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Alternative 1: Rewind generator stator and refurbish the rotor field poles - This is the recommended alternative. This alternative results in a replacement power cost savings for customers and the avoidance of future O&M expense cost increases associated with maintenance of these aging assets.

Alternative 2: Reschedule project by one year – Rescheduling the project by one year increases the likelihood of a generator failure before the rewind resulting in a prolonged forced outage (a minimum of two years). This results in a replacement power costs for customers. This alternative also results in higher capital costs to rewind the generator stator and refurbish the rotor field poles on an expedited basis.

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Project Summary

Project Title: Drum 1 Powerhouse – Units 1-4 Automation

Major Work Categories: 2M
Planning Order Numbers: 5806397
Project Start Date: 2024
Project Completion Date: 2027
Operative Date (only applies to Capital): Jan-2027

Project Description

Drum 1 Powerhouse is located on Bear River in Placer County, CA and it is part of PG&E's Drum-Spaulding Hydroelectric Project No. 2310. Drum 1 Powerhouse consists of four generating units, referred to as Drum Units 1-4, with a maximum normal operating capacity of 54,000 KW. Power Generation is preparing to make a digital transition of its hydroelectric powerhouse automation infrastructure. A SCADA Automation Program has been established to develop baseline standards, baseline specifications, system requirements, and templates for use in subsequent phases by operations and project teams. The project proposes to replace the existing RTUs at Drum 1 PH and provide additional powerhouse automation capabilities using a new Allen-Bradley Control Logix PLCs. The project will also include a visualization workstation to view (local and remote) system status and the addition of a data historian for trending and analysis.

Justification

As part of this automation program, Drum 1 PH has been selected to proceed with the digital transition. The existing RTUs and I/O boards at Drum 1 PH are obsolete and do not comply with new Cyber Security and Critical Infrastructure Protection (CIP) requirements. This project will replace the existing RTUs with scalable Allen Bradley PLCs and robust network architectures to comply with Cyber Security and ISO 55000 standards and to build the foundation for future automation technology. Automation will also allow real time adjustments for the grid as needed based on demand and load.

Cost

The cost assumptions for this project are based on professional judgment and historic PG&E cost data for similar work.

Major Project Spending Estimates
(Thousands of Nominal Dollars)

CAPITAL

Planning Order	Description	Operative Date	2024 CWIP	2025 Forecast	2026 Forecast	2027 Forecast	2028 Forecast	2029 Forecast	2030 Forecast	CWIP + 2025 - '30 Total
5806397	Drum 1 PH – Units 1-4 Automation	October 2029	9	-	-	420	233	4,473	117	**5,251**

Benefits

Potential avoidance of future O&M expense cost increases associated with maintaining this aging equipment. A higher level of power generation reliability resulting from a reduction in response time to unmanned facilities that will be able to clear alarms remotely rather than traveling to the site to restore the unit. This results in a cost savings for customers.

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Alternatives Considered

Status Quo (Do Nothing) – This alternative proposes PG&E does nothing. This alternative is not preferred given that the age of the equipment and required in person manual switching of alarms and restarting of a tripped unit.

Alternative 1 – Transition of the powerhouse to an automation infrastructure allowing for remote operations and real time unit communications. This allows for less delayed responses due to travel time for an operator as well was real time adjustments for the grid as needed.

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Project Summary

Project Title: Drum 2 – Unit 5 Rewind

Major Work Categories: 2M
Planning Order Numbers: 5760669
Project Start Date: 2018
Project Completion Date: 2029
Operative Date: October 2027

Project Description

Drum 2 Powerhouse is a one-unit, 50 MW powerhouse located next to the Bear River near Alta, California. It has been in service since 1965. The Drum 2 Powerhouse produces an average of approximately 270 GWH of electricity per year. The generator rewind project will rewind the existing generator at Drum 2 powerhouse.

Justification

The justification for this project is reliability. The stator windings and field poles were last rewound in 1985 by English Electric Coil and have exceeded their expected service life. The stator winding insulation is aged and a rotor pole inspection in 2024 revealed poor insulation resistance values across all poles. Rewind of this generator will reduce the risk of failure in service and improve the reliability of power generation.

Cost

The cost assumptions for this project are based on a) the professional judgment of the engineers familiar with this type of work; and (b) historic PG&E cost data for similar work.

Major Project Spending Estimates
(Thousands of Nominal Dollars)

CAPITAL

Planning Order	Description	Operative Date	2024 CWIP	2025 Forecast	2026 Forecast	2027 Forecast	2028 Forecast	2029 Forecast	2030 Forecast	CWIP + 2025 - '30 Total
5760669	Drum 2 – Rewind	October 2027	123	-	1,165	7,703	2,294			**11,284**

Benefits

Benefits improvement in reliability resulting from a reduction in forced outages caused by this aging equipment. This results in replacement power cost savings for customers. Benefits also include the avoidance of higher capital costs for a rewind on an expedited basis if the generator windings fail.

Alternatives Considered

Status Quo: Do Nothing – This alternative is not recommended. Running the generator until it fails would result in a prolonged forced outage (a minimum of two years). This results in replacement power costs for customers. This alternative also results in higher capital costs to rewind the generator stator and refurbish the rotor field poles on an expedited basis.

Alternative 1: Rewind generator stator and refurbish the rotor field poles – This is the recommended alternative. This alternative results in a replacement power cost savings for customers and the avoidance of higher capital costs to rewind the generator stator and refurbish the rotor field poles on an expedited basis.

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Alternative 2: Reschedule project by one year – This alternative is not recommended. Rescheduling the project by one year increases the likelihood of a generator failure before the rewind resulting in a prolonged forced outage (a minimum of two years). This results in a replacement power costs for customers and higher capital costs to rewind the generator stator and refurbish the rotor field poles on an expedited basis.

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Project Summary

Project Title: Drum-Spaulding License Conditions

Major Work Categories: 3H
Planning Order Numbers: 5719538, 5720508
Project Start Date: 2008
Project Completion Date: 5719538 – 2027, 5720508 – 2031
Operative Date (only applies to Capital): 5719538 – December 2027, 5720508 – December 2030

Project Description

The Drum-Spaulding (DS) Project includes 11 powerhouses located in the Bear and Yuba River watersheds. The 11 DS Project powerhouses have a combined normal operating capacity of 184 MW. The current Project License expired in 2013, and the Project currently operates under an annually renewing license. PG&E started the relicensing process in 2008.

The forecast cost includes the work necessary to continue the relicensing process and to implement new license conditions. PG&E's Federal Energy Regulatory Commission (FERC) relicensing application and amendments filed in 2011 through 2013 proposed that the Project be separated into three licenses. FERC issued the Final Environmental Impact Statement (FEIS) for relicensing the projects on December 19, 2014, and an Order approving a partial transfer of the license for the Deer Creek Development to Nevada Irrigation District on November 18, 2021. Ongoing work to obtain two new FERC licenses for the Upper Drum and Lower Drum Hydroelectric Projects continues and includes support for FERC's Endangered Species Act Section 7 processes, acquisition of a Water Quality Certificate from the State Water Resources Control Board (SWRCB), and preparations for license acceptance and implementation.

Justification

Under the Federal Power Act (FPA), the owner of a hydropower project must obtain a license from FERC to operate its project. At the end of the license term, a licensee may apply to relicense its project. The FPA and FERC's implementing regulations specify a comprehensive and rigorous process a licensee must complete to successfully renew its license. The minimum 5-year regulatory process, which often takes substantially longer to complete, includes extensive stakeholder involvement, performance of comprehensive resource studies and balancing of complex societal and environmental issues. Licensees must be highly engaged with stakeholders and plan relicensing activities prior to the relicensing process beginning with filing of a Notice of Intent and Pre-Application Document and must continue relicensing activities through filing the License Application and subsequent environmental review processes leading to issuance of the new license by FERC. The schedule for issuance of a new license is generally uncertain and can take decades.

A licensee cannot always accurately forecast the scope and costs of license implementation because the measures that will be required are not known in advance and often take years of study of potential impacts before new operating conditions can be specified. This is why PG&E has requested, and the Commission has approved that this work be subject to balancing account treatment.

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Cost

The cost assumptions for these projects are based on the professional judgment of project managers and engineers familiar with this type of work and historic PG&E cost data for similar work.

The new FERC License Conditions are uncertain until the license is issued by FERC; however, the cost forecasts are based study results and discussions held with the regulatory agencies and stakeholders throughout the relicensing process, and on the Company's experience with implementing recent similar License conditions.

Major Project Spending Estimates
(Thousands of Nominal Dollars)

CAPITAL

Planning Order	Description	Operative Date	2024 CWIP	2025 Forecast	2026 Forecast	2027 Forecast	2028 Forecast	2029 Forecast	2030 Forecast	CWIP + 2025 - '30 Total
5719538	Drum-Spaulding Relicensing	December 2027		733	794	953				**2,480**
5720508	Drum-Spaulding License Conditions	December 2030				414	3,176	8,784	13,727	**26,101**

Benefits

The benefits of this project include a new FERC license for Spaulding #1, Spaulding #2, Spaulding #3, Drum #1, Drum #2, Alta, Dutch Flat, Halsey, Wise, Wise #2 and New Castle powerhouses by 30-50 years so that PG&E can continue to operate these powerhouses to benefit customers and the general public.

Alternatives Considered

Status Quo: Do nothing – This alternative is not recommended. Under this alternative, PG&E would simply abandon the FERC licensing process that has already begun. The result of which would be PG&E's current FERC license not being renewed, and PG&E would not be able to continue operating the powerhouses within the Drum-Spauling project. If PG&E would choose to continue to operate, exorbitant fines from FERC would be incurred and potentially risking PG&E's good standing with FERC.

Alternative 1: Continue to license the Drum-Spaulding Project and plan to implement the license conditions – This is the recommended alternative. Under this alternative, PG&E customers and the general public would continue to receive all the benefits of the Drum-Spaulding Project.

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Project Summary

Project Title: Drum Unit 4 – Refurbish Turbine, Shaft and Bearings

Major Work Categories: 2N
Planning Order Numbers: 5802826
Project Start Date: August 2025
Project Completion Date: June 2029
Operative Date (only applies to Capital): December 2028

Project Description

Drum 1 Powerhouse has 4 Units and Drum 2 Powerhouse has 1 Unit. Drum 1 Powerhouse serves as the switching center for the Drum Spaulding Licensed powerhouses and has operators onsite 24/7 and is located nearly equidistant between the Upper and Lower Drum system. Drum U4 produces approximately 16MW and releases up to 160CFS (at full load) supplying water to Nevada Irrigation District for water consumption.

The scope of this work is to capture as-found dimensions, engineer, procure and construct new turbine bearings and re-machine the turbine shaft to engineered specifications.

Justification

Drum U4 flooded in the late 1990s due to a major storm resulting in turbine shaft pitting and accelerated wear to bearings. Not machining the turbine shaft or replacing the bearings results in increases in bearing wear and increases the likelihood of forced outages due to bearing wipes. Onsite machining of the shaft and new bearings extend the life of both the turbine shaft and guide bearings.

Cost

The cost assumptions for this project are based on professional judgment of the local engineering and hydro team familiar with this type of work.

Major Project Spending Estimates
(Thousands of Nominal Dollars)

CAPITAL

Planning Order	Description	Operative Date	2024 CWIP	2025 Forecast	2026 Forecast	2027 Forecast	2028 Forecast	2029 Forecast	2030 Forecast	CWIP + 2025 - '30 Total
5802826	Drum, Unit 4 – Refurbish Turbine, Shaft and Bearings	December 2028	2	1,446	39	48	1,421			**2,955**

Benefits

This project results in the avoidance of future O&M expense cost increases associated with maintaining this aging equipment. In addition, a higher level of power generation reliability will be realized resulting from a reduction in forced outages caused by this aging equipment. This results in replacement power cost savings for customers.

Alternatives Considered

Status Quo: Do nothing – Not recommended due to the increased likelihood of forced outages and further bearing and shaft damage resulting in additional O&M costs and replacement power costs for customers.

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Alternative 1: Turbine shaft machining and bearing replacement – This is the recommended alternative. This alternative results in the avoidance of future O&M expense cost increases associated with maintaining this aging equipment. In addition, a higher level of power generation reliability will be realized resulting from a reduction in forced outages caused by this aging equipment. This results in replacement power cost savings for customers.

Alternative 2: Turbine shaft and bearing replacement – Even though this alternative has similar benefits as Alternative 1, it is not recommended. A new or off-site machined turbine shaft poses two primary risks: 1. Damage during transport, and 2. Machining delays from offsite shops. Also, trying to match a new shaft to an unmatched bearing can result in additional bearing wipes and forced outages. Overall, this alternative is riskier and would be an increase in capital cost while providing the same level of benefit as Alternative 1.

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Project Summary

Project Title: Electra Powerhouse – Crane Modernization

Major Work Categories: 2P
Planning Order Numbers: 5779575
Project Start Date: January 2028
Project Completion Date: November 2029
Operative Date: December 2029

Project Description

Electra Powerhouse is located on the Mokelumne River approximately 12 miles east of Jackson, California. The Electra Powerhouse Crane Modernization project aims to refurbish the aging powerhouse crane to improve its reliability and enhance maneuverability. The proposed upgrades include motorizing the bridge and trolley travel, adding a 10-ton auxiliary hoist for smaller loads, replacing the exposed 240V bus with a festoon system, and incorporating a pendant or wireless remote control. These enhancements will enable operators to safely monitor and manage crane movements while addressing existing limitations in load handling. Modernization also includes installing crane limits to prevent the spool from unwinding, mitigating significant safety risks to personnel. The refurbishment will align the crane with desired operating conditions to support critical powerhouse projects that depend on reliable crane operations in which the crane will be needed to lift large and heavy components of the unit for maintenance or replacement of internal parts.

Justification

The current crane's outdated technology hinders efficient operation, resulting in productivity challenges and potential safety hazards. A refurbished crane will enhance operational efficiency, meet safety standards, and support crane-dependent projects effectively. Deferring this project could lead to continued inefficiencies and increased safety risks, including potential hazards from unwinding spools.
The recommended refurbishment approach balances cost-effectiveness with achieving project objectives, making it a more practical alternative compared to complete replacement. Modernizing the crane will ensure reliability and long-term usability while addressing safety concerns and improving project workflows.

Cost

The cost assumptions for this project is based on: (a) the professional judgment of the engineers familiar with this type of work; and (b) historic PG&E cost data for similar work.

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Major Project Spending Estimates
(Thousands of Nominal Dollars)

CAPITAL

Planning Order	Description	Operative Date	2024 CWIP	2025 Forecast	2026 Forecast	2027 Forecast	2028 Forecast	2029 Forecast	2030 Forecast	CWIP + 2025 - '30 Total
5779575	AG Wishon – Replace Exciter	December 2029					1,835	2,080		**3,915**

Benefits

- Potential avoidance of future O&M expense cost increases associated with maintaining this aging equipment.
- A higher level of power generation reliability resulting from a reduction in forced outages caused by this aging equipment. This results in replacement power cost savings for customers.
- Increased productivity for crane-dependent projects.
- By incorporating modern control systems and mechanical upgrades, the project ensures compliance with current safety standards while extending the crane's lifespan.

Alternatives Considered

Status Quo- Do nothing – This alternative is not recommended. Attempting to maintain the existing crane will result in future O&M expense cost increases associated with maintaining this aging equipment; an increase in forced outages resulting in replacement power costs to customers; safety risks; and no improvement in productivity for crane-dependent projects.

Alternative 1: Replacement- This alternative is not recommended. While replacing the crane has the same benefits as the proposed project, it is less cost-effective due to the higher capital costs.

Alternative 2: Refurbishment- This alternative is the recommended solution as it realizes all the above benefits at the lowest capital cost.

Alternative 3: Repair- This alternative is not recommended. This alternative is essentially the same as the status quo alternative.

Alternative 4: Retirement- This alternative is not recommended. The crane is required to continue to maintain the powerhouse. This alternative would lead to the shutdown of the powerhouse because PG&E would no longer be able to maintain it. This alternative would not be in the best interests of the customer.

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Project Summary

Project Title: Electra Powerhouse – FERC Security Improvements, Upgrade Security Fencing
Major Work Categories: 3H
Planning Order Numbers: 5808990
Project Start Date: June 2024
Project Completion Date: July 2025
Operative Date (only applies to Capital): March 2025

Project Description

Electra Powerhouse (PH) is owned and by operated by PG&E and is part of PG&E's Mokelumne River Project (FERC Project No. 137). Electra PH is located on the Mokelumne River near Jackson, California, and has a generation capacity of 98 megawatts. PG&E Corporate Security and the Federal Energy Regulatory Commission (FERC) have identified Electra PH as an at-risk facility requiring physical security upgrades. This project serves to address these vulnerabilities and is part of a larger program to upgrade security and surveillance systems across the entire system. This project is focused on security fencing and access gates at Electra Powerhouse.

This project will replace existing security fencing and gates to reduce the risk of unauthorized personnel from accessing the powerhouse, switchyard, and equipment furthermore protecting PG&E critical assets. Implementing these security measures at the Electra PH enhances safety and security by ensuring that PG&E adequately adheres to FERC recommendations and corporate security standards.

Justification

PG&E received a letter, dated September 14, 2022, from FERC, identifying Electra PH as an at-risk facility requiring physical security. PG&E subsequently hired a consultant (Blair, Church & Flynn (BCF)) to review site conditions, obtain photographs, discuss proposed design improvements, and incorporate FERC recommendations. Their recommendations included replacing the existing chain link perimeter fences and gates with a high-security alternative meeting PG&E's corporate security standard SEC-2010S.

Cost

The cost assumptions for these projects are based on the professional judgment of the engineers familiar with this type of work.

Major Project Spending Estimates
(Thousands of Nominal Dollars)

CAPITAL

Planning Order	Description	Operative Date	2024 CWIP	2025 Forecast	2026 Forecast	2027 Forecast	2028 Forecast	2029 Forecast	2030 Forecast	CWIP + 2025 - '30 Total
5808990	Electra PH – Upgrade Sec Fencing (FSI)	March 2030	926	886						1,812

Benefits

The project provides an adequate level of security for PG&E assets in compliance with FERC's security recommendations.

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Alternatives Considered

Status Quo- Do nothing. This alternative assumes that no action is taken to comply with the FERC security recommendations. This results in security vulnerabilities that could put PG&E's generation assets at risk.

Alternative 1: Implement this Project –This is the recommended alternative.

Alternative 2: Delay Project by One Year - This alternative has the same long-term benefits as the recommended alternative; however, in the short-term, this alternative is not recommended for the reasons stated in the Status Quo alternative.

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Project Summary

Project Title: FERC-2661 (Hat Creek #1 & #2) Relicensing

Major Work Categories: 3H
Planning Order Numbers: 5793127
Project Start Date: 2025
Project Completion Date: 2031
Operative Date (only applies to Capital): December 2030

Project Description

Hat Creek 1 and 2 are one-unit powerhouses located in the Pit River watershed in Shasta County. The Hat Creek Powerhouses have a combined normal operating capacity of 17 MW.

The current Project license expires in 2032. This relicensing project is expected to result in the Company obtaining a new long-term Federal Energy Regulatory Commission (FERC) license for the Project, which will allow PG&E to continue to provide safe and reliable electric generation to our customers in a responsible and environmentally sensitive manner. FERC's Integrated Licensing Process is the default process to obtain a new 40 to 50-year operating license.

Justification

Under the Federal Power Act (FPA), the owner of a hydropower project must obtain a license from FERC to operate its project. At the end of the license term, a licensee may apply to relicense its project. The FPA and FERC's implementing regulations specify a comprehensive and rigorous process a licensee must complete to successfully renew its license. The minimum 5-year regulatory process, which often takes substantially longer to complete, includes extensive stakeholder involvement, performance of comprehensive resource studies and balancing of complex societal and environmental issues. Licensees must be highly engaged with stakeholders and plan relicensing activities prior to the relicensing process beginning with filing of a Notice of Intent and Pre-Application Document and must continue relicensing activities through filing the License Application and subsequent environmental review processes leading to issuance of the new license by FERC. The schedule for issuance of a new license is generally uncertain and can take decades.

Cost

The cost assumptions for this project are based on the professional judgment of the engineers and licensing professionals familiar with this type of work and historic PG&E cost data for similar work.

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Project Summary

Major Project Spending Estimates
(Thousands of Nominal Dollars)

CAPITAL

Planning Order	Description	Operative Date	2024 CWIP	2025 Forecast	2026 Forecast	2027 Forecast	2028 Forecast	2029 Forecast	2030 Forecast	CWIP + 2025 - '30 Total
5793127	FERC-2661 (Hat Creek 1 & 2) Relicensing	December 2030		300	414	778	2,557	2,371	1,091	**7,512**

Benefits

The benefit of this project is to obtain a new FERC license for the Hat Creek Project so that PG&E can continue to operate the powerhouses to benefit customers and the general public.

Alternatives Considered

Status Quo: Do nothing – This alternative is not recommended. Under this alternative, PG&E would simply abandon the FERC licensing process. The result of which would be PG&E's current FERC license not being renewed, and PG&E would not be able to continue operating the Hat Creek powerhouses. If PG&E would choose to continue to operate, exorbitant fines from FERC would be incurred and potentially risking PG&E's good standing with FERC.

Alternative 1: Relicense the Hat Creek Project – This is the recommended alternative. Under this alternative, PG&E customers and the general public would continue to receive all the benefits of the Hat Creek Project.

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Project Summary

Project Title: Haas – Install ISO Phase Maintenance Platform

Major Work Categories: 2M
Planning Order Numbers: 5792742
Project Start Date: 2021
Project Completion Date: 2027
Operative Date (only applies to Capital): September 2027

Project Description

Currently, temporary scaffolding is needed to the clean the iso-phase bus insulators on the generator bus in the Haas elevator shaft. It takes longer to erect and remove the temporary scaffolding than to perform the cleaning. Also, erecting and removing the temporary scaffolding and working from the temporary scaffolding present more personnel safety risks than do permanent platforms. The outcome of this project will eliminate the need for temporary scaffolding to perform this cleaning. Steel platforms will be mounted on beams in the stairwell adjacent to the ISO Phase Bus Insulator hatch openings. Paneling and/or backrests will be installed to provide fall/dropped object prevention over stairway opening.

Justification

This project aims to create a safer work environment for technicians and operators performing routine maintenance on the ISO Phase bus. By implementing measures to prevent dropped objects, it protects individuals working or passing below. Additionally, it provides a more ergonomic and less hazardous workspace, aligning with the company's goal of ensuring a safe working environment.

Cost

The cost assumptions for this project are based on the professional judgment of the engineers familiar with this type of work, historic PG&E cost data for similar work and secured proposal cost from vendors, constructors, and industry professionals along with estimated installation overheads.

Major Project Spending Estimates
(Thousands of Nominal Dollars)

CAPITAL

Planning Order	Description	Operative Date	2024 CWIP	2025 Forecast	2026 Forecast	2027 Forecast	2028 Forecast	2029 Forecast	2030 Forecast	CWIP + 2025 - '30 Total
5792742	Haas – Install ISO Phase Maintenance Platform	August 2027	224	-	58	2,691				**2,974**

Benefits

- Reduces hazards from falling objects, working from heights, and bad ergonomics for maintenance workers.
- Saves time for setup and relocating scaffolding during the ISO Phase maintenance activities.

Alternatives Considered

Status Quo: Do nothing – Not preferred; dropped and falling object hazards persist, and the temporary scaffolding will require more inspections and maintenance than a permanent structure.

Alternative 1: Replace (recommended) – Install new permanent platforms to provide access to the ISO Phase Bus panel openings in the stairwell.

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Project Summary

Project Title: Haas – Upgrade Crane Controls

Major Work Categories: 2P
Planning Order Numbers: 5791558
Project Start Date: 2016
Project Completion Date: 2029
Operative Date (only applies to Capital): December 2028

Project Description

The Haas Powerhouse (PH) is located at latitude 36.927 and longitude -119.020 in Fresno County California near Blackrock Reservoir at an elevation of 4606 ft. Haas PH houses two (2) 72 MW Pelton Wheel Turbine/Generators. Water is supplied from the Wishon Reservoir via Haas Tunnel and continuing through a penstock.

There are two (2) overhead bridge cranes manufactured by Judson Pacific Murphy rated at 135/15 tons located above the generators to service the units and other material handling needs of the plant. The cranes are identified as 07-7158 and 07-71590 by Cal/OSHA and are over 60 years old. Due the age, type of controls, and future needs, an upgrade is required for the continued safe operation of the Haas Powerhouse. The ability to safely handle loads during both major outages and during routine operations is the primary objective of this project.

Justification

Based upon the number of years that the cranes have been in service (over 60 years), the current hazards associated with the drum switch controllers, and the design limitation of the wound rotor motor speed control concept, PG&E plans to upgrade the Hass crane controls to ensure continued safe and reliable service.

Cost

The cost assumptions for this project are based on professional judgment and historic PG&E cost data for similar work.

Major Project Spending Estimates
(Thousands of Nominal Dollars)

CAPITAL

Planning Order	Description	Operative Date	2024 CWIP	2025 Forecast	2026 Forecast	2027 Forecast	2028 Forecast	2029 Forecast	2030 Forecast	CWIP + 2025 - '30 Total
5791558	Haas – Upgrade Crane Controls	December 2028	285	-	55	566	3,707			**4,612**

Benefits

This project proposes to restore the cranes to a safe and reliable operational condition and bring them up to current standards of technology. Implementing the upgrades will increase material handling safety, increase productivity and minimize crane down time resulting in a reduction of extended outages and the corresponding reduction in customer replacement power costs.

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Alternatives Considered

Status Quo – Do Nothing. Reliable operation of Hass Powerhouse crane is critical for future work, as well as emergent work on the Haas units that requires rotor lifts. This alternative would compromise safety, adversely affect productivity, and increase the customer cost of replacement power as a result of extended outages due to crane failures.

Alternative 1: Haas Powerhouse Crane Upgrades. This is the recommended alternative. This alternative ensures continued reliable service in the future.

Alternative 2: Retire Haas Powerhouse Crane. Not considered a feasible alternative. The cranes are required to support annual powerhouse maintenance inspections as well as other planned powerhouse improvement projects.

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Project Summary

Project Title: Halsey Powerhouse – Replace Turbine Shutoff Valves

Major Work Categories: 2M
Planning Order Numbers: 5781045
Project Start Date: 2029
Project Completion Date: 2031
Operative Date: December 2031

Project Description

Halsey is a one-unit 11 MW powerhouse located in the Drum Spaulding Hydroelectric Project in central California. Halsey Powerhouse has been in service since 1916. Water passing through this powerhouse is delivered downstream to Placer County Water Agency for consumptive use in Placer County. The powerhouse contains a single double-overhung Francis style turbine.
The existing 72" butterfly type turbine shutoff valves (TSVs) at Halsey powerhouse were originally installed in 1916 and have reached the end of their useful life after what will be 114 years in service when they are replaced during the 2030 outage. The existing motor operators and bypass valve have also reached the end of their useful lives and should be replaced as a complete package with the TSVs, which would also include an upgrade to the existing controls scheme. Additionally, the existing TSV pedestals are showing signs of aging (cracking) and should be repoured.

Justification

The purpose of this project is to replace the two (2), 72” TSV assemblies to include body, disk, seats, trunnions, shaft, lever arm, actuator, bypass assembly, companion flange, and other miscellaneous related components to make the assembly fully functional. Completion of this project will reduce the likelihood of future forced outages related to TSV failure and will simplify future operation of the facility.

Cost

The cost assumptions for this project are based on: (a) the professional judgment of the engineers familiar with this type of work; and b) historic PG&E cost data for similar work.

Major Project Spending Estimates
(Thousands of Nominal Dollars)

CAPITAL

Planning Order	Description	Operative Date	2024 CWIP	2025 Forecast	2026 Forecast	2027 Forecast	2028 Forecast	2029 Forecast	2030 Forecast	CWIP + 2025 - '30 Total
5781045	Halsey TSV Actuator Replacement	December 2031	13	-	-	-	-	780	3,280	**4,073**

Benefits

- Potential avoidance of future O&M expense cost increases associated with maintaining this aging equipment.
- A higher level of power generation reliability resulting from a reduction in forced outages caused by this aging equipment. This results in replacement power cost savings for customers.

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Project Summary

Alternatives Considered

Status Quo: Do Nothing – This alternative is not recommended. This alternative does not address the future O&M expense cost increases associated with maintaining this aging equipment. It also does not address the forced outages caused by this aging equipment and the additional time to safely clear the entire penstock for outage work (rather than relying on the TSV as a clearance point). Any emergency clearance requiring work on the turbine or generator will require this due to clearance procedures. This additional outage time results in replacement power costs for customers.

Alternative 1: Repair the TSVs: This alternative is not recommended. The TSVs are well over 100 years old, and a repair would present several risks. Recent repairs to the TSV at another powerhouse resulted in the valve failing when being re-installed, costing both the initial maintenance costs to remove, refurbish, and reinstall but also the generation losses of the delay and the cost of a new valve. Once a valve is removed, the penstock and turbine block can shift, or are under stresses such that reinstallation is very difficult.

Alternative 2: Replace the TSVs: This is the recommended alternative. This alternative results in the avoidance of future O&M expense cost increases associated with maintaining this aging equipment. It also results in a higher level of power generation reliability resulting from a reduction in forced outages caused by this aging equipment and saves time by allowing PG&E to rely on the TSV as a clearance point rather than having to clear the entire penstock for outage work. This higher level of power generation reliability results in replacement power cost savings for customers.

PACIFIC GAS AND ELECTRIC COMPANY
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Project Summary

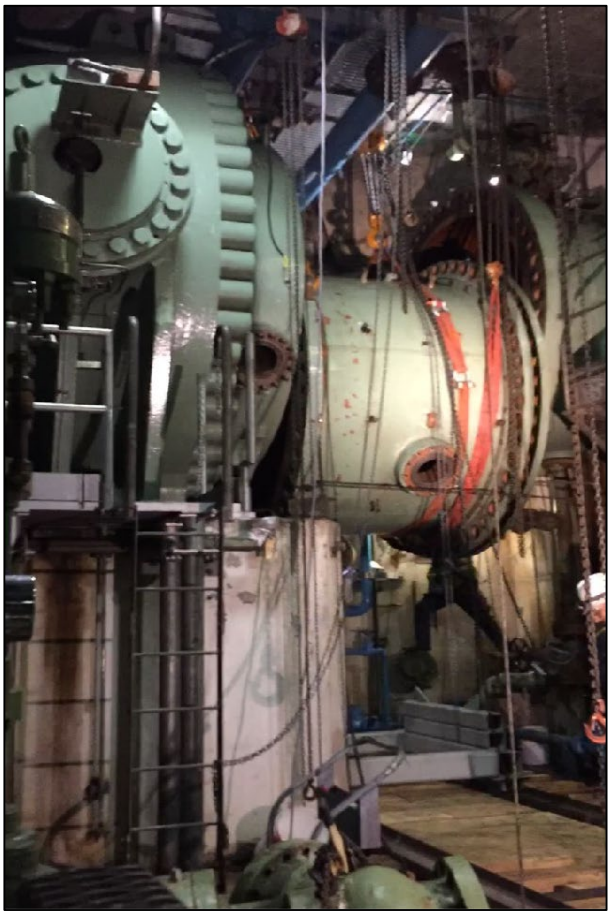
Project Title: Helms – Draft Tube Gates & Turbine Improvements

Major Work Categories: 2M
Planning Order Numbers: 5778043, 5778044, 5778045, 5809738, 5809739, 5809740, 5809741
Project Start Date: 5778043, 5778044, 5778045 – 2018; 5809738, 5809739, 5809740, 5809741 – 2024
Project Completion Date: 5778043, 5778044, 5809741 – 2029; 5778045 – 2027; 5809738, 5809740 – 2030; 5809739 – 2032
Operative Date (only applies to Capital): 5778043, 5778044 – March 2029; 5778045 – December 2027; 5809738, 5809740 – December 2029; 5809739 – December 2031; 5809741 – December 2028

Project Description

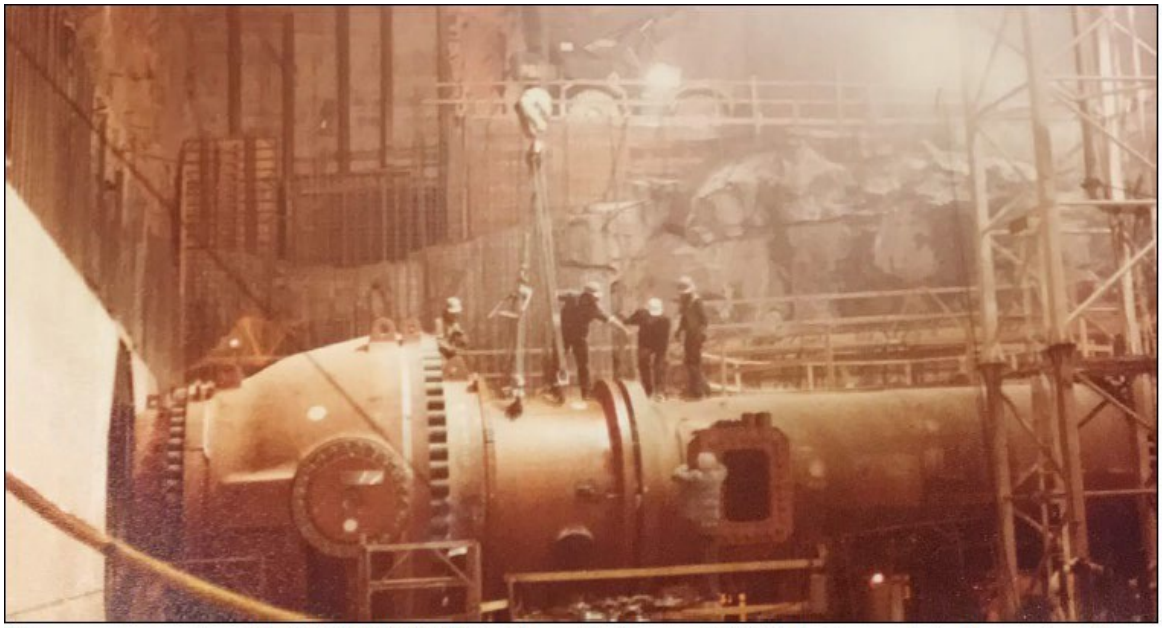
The projects seek to replace the existing Turbine Shutoff Valves (TSVs) at Helms Powerhouse with new TSVs, specifically designed to meet the current and future expected operational frequency requirements. The projects also propose to replace the current Draft Tube Gates (DTGs) with a new, proven, and simpler design that increases the reliability of the DTGs operation and reduces the risk of failure and subsequent forced outage.

Helms Unit 2 Turbine Shutoff Valves (TSV)



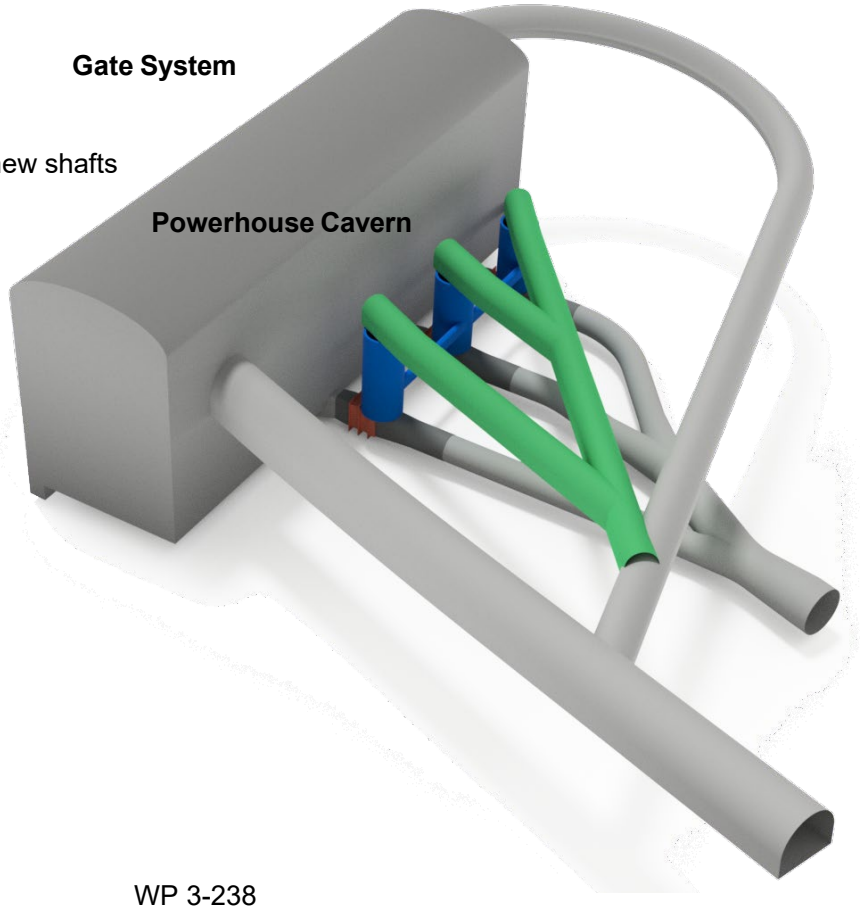
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Historical Photo of Helms Unit 1 Turbine Shutoff Valve (TSV)



Crews connecting Unit 1 TSV (left) to the spiral case (right) during original construction.

Diagram of Helms Draft Tube
Green – new draft tube tunnels Blue – new shafts
Grey – existing infrastructure



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Justification

Commissioned in 1984, the TSVs at Helms Pumped Storage Plant (Helms PSP) are original powerhouse equipment and have been in constant operation for over 40 years. The TSVs at Helms PSP are past their industry standard service life and all three TSVs are exhibiting some form of component wear and/or failure. The TSVs are showing the expected signs of age such as worn trunnions and leaking internal seals, but in addition Helms has experienced multiple in-service failures of the TSV downstream seals on all Units 1, 2, and 3. Two of the three valves have known issues with the upstream seals, and all three valves have had two failures each of the downstream seal, requiring forced outages to repair. These in-service failures require forced outages to make repairs, impacting the generation market and electric grid conditions, resulting in higher costs to customers. In addition, the TSVs employ a poor design of the upstream seal mechanical locks that are prone to failure during application with the inability to repair in-service. With the current energy market requiring multiple TSV operation cycles per day, equipment wear is magnified, hastening the need to replace the current valves with newer ones that are engineered and built with current and future operational frequency needs in mind. Failures require downtimes ranging from 2 to 12 plus weeks, which impact PG&E's ability to provide stable electricity to the California grid as well as the stability of the generation market.

The draft tube gates have been problematic during operation and have required multiple projects and repairs to maintain operability since the original commissioning in 1984. Recent studies conducted by PG&E have indicated that pressure pulsations exist at the DTG location that "shake" the gate, which exacerbates the wear and tear to the moving parts of the gate. This "shaking" is further compounded by the current operating protocol of the plant, which sees multiple pump-and-generate cycles daily. These pump-and-generate cycles switch the flow of water across the face of the gates, compounding the cyclic loading of the gates. Efforts to improve and refurbish major components of the gates have been required in recent years in response to the extensive damage found upon inspection during maintenance outage cycles. The DTGs are no longer considered reliable due to the increasing instances of damage. To re-establish operational reliability, the existing DTGs need to be replaced at the earliest opportunity with a design that provides and ensures consistent, dependable operation.

Cost

The cost assumptions for these projects are based on the professional judgment of the engineers familiar with this type of work and historic PG&E cost data for similar work.

PACIFIC GAS AND ELECTRIC COMPANY
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Project Summary

Major Project Spending Estimates
(Thousands of Nominal Dollars)

CAPITAL

Planning Order	Description	Operative Date	2024 CWIP	2025 Forecast	2026 Forecast	2027 Forecast	2028 Forecast	2029 Forecast	2030 Forecast	CWIP + 2025 - '30 Total
5778043	Helms, Unit 1 – Replace TSV	March 2029	5,974	5,943	3,353	2,774	13,156	1,857		**33,058**
5778044	Helms, Unit 2 – Replace TSV	March 2029	6,435	3,694	5,642	2,854	13,242	1,876		**33,743**
5778045	Helms, Unit 3 – Replace TSV	December 2027	8,306	4,713	18,268	3,464				**34,751**
5809738	Helms, Unit 1 – Install Draft Tube Gate	December 2029	268	1,305	2,222	5,512	8,769	5,091	50	**23,218**
5809739	Helms, Unit 2 – Install Draft Tube Gate	December 2031					688	1,325	24,028	**26,041**
5809740	Helms, Unit 3 – Install Draft Tube Gate	December 2029	493	-	1,088	1,725	4,071	20,551	217	**28,144**
5809741	Helms – Draft Tube Gate Tunnels	October 2028	494	-	611	790	20,785	25		**22,705**

Benefits

The new TSVs will be designed to operate at current operational requirements, which require multiple operations per day to respond to energy market fluctuations. In addition, the new TSV designer will utilize lessons learned from known issues of the existing valves to design and build valves that either minimize or eliminate these problems. The new valves will target an operational life of 40 years assuming 3 to 4 operations per day, as opposed to the current valves, designed to operate 3 to 4 times per week.

With the new DTGs projects being executed, the need to perform regularly scheduled capital projects and repair iterations will be avoided. The new Bonneted Slide Gates (BSG) will be essentially a “maintenance-free” solution. This project, once implemented, will greatly reduce the amount of effort and time required to maintain the new draft tube gates when compared to the existing draft tube gates.

These benefits of these projects are as follows:

- Potential avoidance of future O&M expense cost increases associated with maintaining this aging equipment.
- A higher level of power generation reliability resulting from a reduction in forced outages caused by this aging equipment. This results in a replacement power cost savings for customers and customer saving associated with Helms being able to take energy from the CAISO during low priced time periods to pump water allowing Helms to be available to generate during high energy priced time periods.

Alternatives Considered

TSVs

Status Quo: Do Nothing – This alternative is not recommended. This alternative requires PG&E to continue to perform capital component installations and potentially emergent repairs on the valves as required to remain in service. This alternative results in multiple outages, some of which will likely be forced outages, resulting in replacement power costs to customers. The resulting repairs will likely increase in cost and difficulty as a result of the increasing age and wear of the valves.

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Alternative 1: Replace & Refurbish TSVs – This alternative is not recommended. This alternative assumes PG&E will purchase one new TSV and replace the old one during an initial outage and then rebuild the old TSVs in two successive outages. This alternative results in three overall outages, project costs are expected to be only 10%-15% less, and results in two different types of TSVs. The additional outage time results in replacement power costs for customers. In addition, this alternative complicates work/operation procedures and spare parts to be kept on hand.

Alternative 2: Replace Complete TSVs on All Units - This is the recommended alternative. This alternative will provide three new replacement TSV's of modern design for installation at Helms. The TSV's would be manufactured to minimize integration work necessary with penstock, foundations, and piping. TSV's would mate to existing flanges in the penstock and utilize the existing servo actuator system to the extent practical. This alternative assumes improved seal and locking mechanism design, 40-year life, and modern design. This alternative results in the avoidance of future O&M expense cost increases associated with maintaining this aging equipment and a higher level of power generation reliability resulting from a reduction in forced outages caused by this aging equipment. This results in a replacement power cost savings for customers and customer saving associated with Helms being able to take energy from the CAISO during low priced time periods to pump water allowing Helms to be available to generate during high energy priced time periods.

DTGs

Status Quo: Do Nothing – This alternative is not recommended. This alternative assumes only maintaining the existing draft tube gates. Considering the history of problems with the existing draft tube gates and the unavoidable inspection and maintenance challenges due to limited access, safety concerns, and life of the current infrastructure, this alternative was not chosen.

Alternative 1: Refurbish the existing DTG system – This alternative is not recommended. This alternative was not selected because of the current system's historical performance and complexity, which indicates that it will likely remain prone to failure in comparison to a bonneted sliding gate arrangement.

Alternative 2: Replace Draft Tube Gates – This is the recommended alternative. This alternative assumes the full replacement of the existing draft tube gates with new hydraulically operated bonneted slide gates, accessed from a new tunnel and shaft system in the rock downstream of the powerhouse. This alternative results in the avoidance of future O&M expense cost increases associated with maintaining this aging equipment and a higher level of power generation reliability resulting from a reduction in forced outages caused by this aging equipment. This results in a replacement power cost savings for customers and customer saving associated with Helms being able to take energy from the CAISO during low priced time periods to pump water allowing Helms to be available to generate during high energy priced time periods.

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Project Summary

Project Title: Helms Equipment Life Cycle Replacement

Major Work Categories: 2M, KH
Planning Order Numbers: Capital: 5780674, 5788224, 5806540, 5810738, Expense: 5810738
Project Start Date: 5222375 – 2025, 55780674 – 2020, 5788224 – 2021, 5806540 and 5810738 – 2024
Project Completion Date: 5222375 – 2029, 5780674 – 2028, 5788224 – 2027, 5806540 – 2029, 5810738 – 2031
Operative Date (only applies to Capital): PO 5780674 – December 2028, 5788224 – March 2027, 5806540 – December 2028, 5810738 – December 2030

Project Description

The Helms Pumped Storage Plant is a 1,212 MW generating and pump station located in the mountains approximately 50 miles east of Fresno, CA. The plant generates electricity by passing water from Courtright Reservoir (upper) to Wishon Reservoir (lower) and has the capability for the generators turn in reverse and pump the water back up to the upper reservoir. This facility provides great value to California and PG&E's customers as it generates power during high energy price periods. The pumping feature is used to pump water from the lower reservoir back to the upper reservoir to store as potential energy that's available to meet peak demands during surges in power consumption and it helps mitigate the effects of inconsistent renewable power sources by compensating for the peaks and valleys of energy availability on California's electrical grid.

Helms U1 and U2 – Refurb Wicket Gate Servo Motors Helms

The Helms Pump Storage project (PSP) Unit 1 (U1) and U2 wicket gate servo motors and their components have degraded from over 20 years of use without refurbishment resulting in diminished reliability of the servo motors. These projects propose to refurbish the wicket gate servo motors and replace critical components such as seals, piston rod bushings, and packing. Following their replacement, the wicket gate servos will be realigned with the operating ring.

Helms U3 Rewind Starting Motor

This project will either refurbish the existing pony motor or replace it with an appropriate alternative pump-start system. The existing system, while operational, has proven to be problematic and unreliable at times requiring extended pump outages. This project will begin with an alternatives analysis that weighs the benefits and disadvantages of the existing pump-start system against more modern options that are more reliable, decrease pump starting times and allow for more pump-starts per day. The features offered by modern systems could further help to ensure grid reliability and flexibility and ultimately prove less costly over the equipment's service life for PG&E and its customers.

Helms PH to Switchyard Control Wiring Replacement

This project proposes to replace or reconfigure the control wiring from the switchyard to the control room in the powerhouse at Helms. The existing wiring terminals are corroded, leading to forced outages resulting in replacement power costs for customers.

Helms - Outage Expense Work

This project supports planned outages at Helms. During planned capital and maintenance outages unforeseen work is typically found, this project puts expense dollars in place to repair or replace any work that is identified during those planned outages.

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Helms Generation Deck Inside Powerhouse – all three units



Justification

Helms U1 and U2 – Refurb Wicket Gate Servo Motors Helms

Completing this work is expected to increase the U1 and U2 reliability and operating efficiency. It will also mitigate existing unit vibration and the resulting unanticipated failures in ancillary equipment.

Helms U3 Rewind Starting Motor

The Helms motor-generators are started in pumping mode using a starting motor mounted on top of the main generator rotor. These smaller motors, referred to as "pony motors" are used to bring the main rotor up to speed in an unloaded condition prior to a pump-start operation. Once at speed, pumping is initiated by introducing water to the runner while the pony motor is de-energized, and the main generator is simultaneously energized to function as the motor to pump water back up to the top reservoir. The existing pony motors are original equipment and have been in service since commissioning in 1984. They are due for a major refurbishment or replacement. The pony motors are a key component in the pumping operation for Helms but present a thermal limiting factor of the amount of pump operations each unit can perform in a day. The overall pony motor system has also been problematic over their operational history. The controlling system is old technology that may be able to be improved upon to reliably serve PG&E customers.

Helms PH to Switchyard Control Wiring Replacement

Water intrusion and the associated corrosion at Helms has made terminal block disassembly difficult and time consuming, perhaps even impossible (as evidenced by several stripped screw heads with cut conductors left on the terminal blocks).

Helms - Outage Expense Work

Replacing and repairing aging and unreliable auxiliary power generation equipment or components during planned outages keeps Helms units running more reliable and reduces the risk of forced outages in the future due to equipment or component failures which helps keep power replacement costs to a minimum for customers.

Cost

The cost assumptions for these projects are based on the professional judgment of the engineers familiar with this type of work, historic PG&E cost data for similar work and secured proposal cost from vendors, constructors, and industry professionals along with estimated installation overheads.

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Major Project Spending Estimates
(Thousands of Nominal Dollars)

CAPITAL/ EXPENSE

Planning Order	Description	Operative Date	2024 CWIP	2025 Forecast	2026 Forecast	2027 Forecast	2028 Forecast	2029 Forecast	2030 Forecast	CWIP + 2025 - '30 Total
5780674	Helms, Unit 1 – Refurbish Wicket Gate Servomotor	December 2028	1,558							**1,558**
5788224	Helms – Replace Control Wiring between PH and Swyd	March 2027	529	-	5,218	951				**6,699**
5806540	Helms, Unit 2 – Refurbish Wicket Gate Servomotor	December 2028				521	3,219	287		**4,027**
5810738	Helms, Unit 3 – Rewind Starting Motor	December 2030	104	-	1,150	5,132	12,935	6,491	5,623	**31,436**
5222375	Helms – Outage Expense Work	n.a.	n.a.	800	-	850	n.a.	n.a.	n.a.	**1,650**

Benefits

Helms U1 and U2 – Refurb Wicket Gate Servo Motors Helms

The project will extend the service life of the servo motors resulting in the avoidance of future O&M expense cost increases associated with maintaining this aging equipment. In addition, this project results in a higher level of power generation reliability resulting from a reduction in forced outages caused by this aging equipment. This results in a replacement power cost savings for customers.

Helms U3 Rewind Starting Motor

Benefits include increased reliability resulting in the avoidance of future O&M expense cost increases associated with maintaining this aging equipment. Benefits also include a higher level of power generation reliability resulting from a reduction in forced outages caused by this aging equipment. This results in a replacement power cost savings for customers. Another benefit is faster starting times and no restrictions on starts per day in comparison to the currently in-service starting system. This results in even more customer benefits.

Helms PH to Switchyard Control Wiring Replacement

Replacement of some wiring and improvement of the terminal sections of this wiring system will ensure continued operational reliability. The existing wiring terminals are corroded, leading to forced outages resulting in replacement power costs for customers. Another benefit is the avoidance of future O&M expense cost increases associated with maintaining this aging equipment.

Helms - Outage Expense Work

Replacing and repairing aging and unreliable auxiliary power generation equipment identified during planned outages reduces future forced outages at Helms resulting in a higher level of power generation reliability resulting from a reduction in forced outages caused by this aging equipment. This results in a replacement power cost savings for customers. Another benefit is the avoidance of future O&M expense cost increases associated with maintaining this aging equipment.

Alternatives Considered

Helms U1 and U2 – Refurb Wicket Gate Servo Motors Helms

Status Quo: Do nothing – This alternative is not recommended. It does not address the future O&M expense cost increases associated with maintaining this aging equipment. It also does not address the forced outages

caused by this aging equipment and the resulting replacement power cost for customers.

Alternative 1: Refurbish – This alternative is recommended. It results in the avoidance of future O&M expense cost increases associated with maintaining this aging equipment. In addition, this project results in a higher level of power generation reliability resulting from a reduction in forced outages caused by this aging equipment. This results in a replacement power cost savings for customers.

Alternative 2: Replace – This alternative is not recommended. Although this alternative has the same benefits as Alternative 1, it has a much higher capital cost and takes more time to manufacture and install all new components.

Helms U3 Rewind Starting Motor

Status Quo: Do nothing – This alternative is not recommended. It does not address the future O&M expense cost increases associated with maintaining this aging equipment. It also does not address the forced outages caused by this aging equipment and the resulting replacement power cost for customers. It also does not result in a faster starting time and still includes restrictions on starts per day resulting in a lost opportunity for PG&E's customers.

Alternative 1: Refurbish/Replace Motor Starting System – This alternative is recommended. Replacement or refurbishment of the starting motor will increase reliability resulting in the avoidance of future O&M expense cost increases associated with maintaining this aging equipment. Replacement/refurbishment will also create a higher level of power generation reliability resulting from a reduction in forced outages caused by this aging equipment. This results in a replacement power cost savings for customers. Another benefit is faster starting times and no restrictions on starts per day in comparison to the currently in-service starting system. This results in even more customer benefits.

Helms PH to Switchyard Control Wiring Replacement

Status Quo: Do Nothing - This alternative is not recommended. This alternative assumes the project team stops the current project and does nothing. The replacement cost for the wiring and terminal boxes is estimated to be $14.8M. If the wiring and terminal boxes continue to be exposed to corrosion and they fail, the cost increases to $17M due to additional costs for expedited installation. In addition, remaining at the status quo will require a future increase in corrective maintenance each year.

Alternative 1: Replace Control Wiring – This is the recommended alternative. Replacement of wiring and improvement of the terminal sections of this wiring system will ensure continued operational reliability. The existing wiring terminals are corroded, leading to forced outages resulting in replacement power costs for customers. This alternative also results in the avoidance of future O&M expense cost increases associated with maintaining this aging equipment.

Helms - Outage Expense Work

Status Quo: Do nothing – This alternative is not recommended. It does not address the future O&M expense cost increases associated with maintaining this aging equipment. It also does not address the forced outages caused by this aging equipment and the resulting replacement power cost for customers.

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Alternative 1: Replace/Repair – This is the recommended alternative. Replacing and repairing aging and unreliable auxiliary power generation equipment identified during planned outages reduces future forced outages at Helms resulting in a higher level of power generation reliability resulting from a reduction in forced outages caused by this aging equipment. This results in replacement power cost savings for customers. Another benefit is the avoidance of future O&M expense cost increases associated with maintaining this aging equipment.

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Project Summary

Project Title: Helms Headquarters – Woodchuck Generator Connection

Major Work Categories: 2P
Planning Order Numbers: 5801578
Project Start Date: 2024
Project Completion Date: 2027
Operative Date (only applies to Capital): November 2026

Project Description

This project proposes to install new underground lines to interconnect from the existing woodchuck generator to Helms Headquarters (HQ) and six residential houses. The interconnection will provide backup power to the HQ building and the homes of PG&E staff during power outages.

Justification

Helms HQ and six residential houses have no permanent backup power available. Due to extreme winter conditions in this area, multi-day or weeklong power outages are quite common. Loss of power presents a life safety risk to residential occupants as temperatures are often in the low teens to zero degrees. This project will replace the need for temporary generators for back-up power with a permanent solution.

Cost

The cost assumptions for this project are based on the professional judgment of the engineers familiar with this type of work and historic PG&E cost data for similar work.

Major Project Spending Estimates
(Thousands of Nominal Dollars)

CAPITAL

Planning Order	Description	Operative Date	2024 CWIP	2025 Forecast	2026 Forecast	2027 Forecast	2028 Forecast	2029 Forecast	2030 Forecast	CWIP + 2025 - '30 Total
5801578	Helms HQ – Woodchuck Generator Connection	November 2026	202	1,000	1,440	71				**2,713**

Benefits

The Helms HQ Woodchuck Generator Connection project will improve life safety for the Helms HQ and the PG&E staff and reduce future increases in expense by providing a permanent power solution.

Alternatives Considered

Status Quo: Do nothing – This alternative is not recommended as there is no permanent backup power options for the Helms HQ or residents of Helms during harsh winter temperature conditions and extended periods of power loss.

Alternative 1: Helms HQ Woodchuck Generator Connection – This is the recommended alternative. This alternative improves life safety for the Helms HQ and the PG&E staff who live there.

Alternative 2: Rent temporary backup generators – This alternative is not recommended. This alternative requires 24/7 maintenance and continuous expense for a non-permanent option.

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Project Summary

Project Title: Helms – Incremental Lifecycle Replacement

Major Work Categories: 2M
Planning Order Numbers: 5811278, 5811279, 5811281
Project Start Date: 2025
Project Completion Date: 5811278 – 2030; 5811279 and 5811281 – 2031
Operative Date (only applies to Capital): 5811278 – December 2029; 5811279 and 5811281 – December 2030

Project Description

The Helms Lifecycle Replacement projects include replacement of key 40-year-old major components that have reached the end of their useful life. It may also include replacement of minor components that have undergone recent and frequent repairs to maintain operations.

Helms Generation Deck Inside Powerhouse – all three units



Justification

Much of the major generation equipment components at Helms PSP are due for lifecycle replacement in the next 10 years. Specifically, the turbine runner and runner mating components, the generator stator windings and core for unit 1 (U1) and unit 3 (U3), and the main step-up transformers are all due for routine lifecycle replacement. The project scope includes replacement of turbine, generator, and transformer components, as well as replacement of necessary balance of plant components. Replacement of these components is essential in maintaining the safe and reliable operations of the Helms Pump Storage powerhouse for another 40-50 years.

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Project Summary

Cost

The cost assumptions for these projects are based on the professional judgment of the engineers familiar with this type of work and historic cost data for similar work.

Major Project Spending Estimates
(Thousands of Nominal Dollars)

CAPITAL

Planning Order	Description	Operative Date	2024 CWIP	2025 Forecast	2026 Forecast	2027 Forecast	2028 Forecast	2029 Forecast	2030 Forecast	CWIP + 2025 - '30 Total
5811278	Helms, Unit 1 – Life Cycle Replacement	December 2029		911	3,890	6,563	10,310	11,921	485	**34,079**
5811279	Helms, Unit 2 – Life Cycle Replacement	December 2030		801	3,258	4,811	6,817	10,080	335	**26,102**
5811281	Helms, Unit 3 – Life Cycle Replacement	December 2031		911	3,890	6,563	10,310	11,921	38,406	**72,000**

Benefits

These projects allow Helms to continue to:

- Be a key resource to help meet the challenges of renewable energy integration onto California's electric grid.
- Help satisfy the clean energy and reliability requirements for PG&E's bundled customers.
- Help satisfy the greater Fresno local capacity area need.
- Avoidance of future O&M expense cost increases associated with maintaining this aging equipment.
- Deliver a higher level of power generation reliability resulting from a reduction in forced outages caused by this aging equipment. This results in a replacement power cost savings for customers and customer saving associated with Helms being able to take energy from the CAISO during low priced time periods to pump water allowing Helms to be available to generate during high energy priced time periods.
- Helps maintain power system stability by providing voltage control and inertia support in response to grid interruptions.

Alternatives Considered

Status Quo: Do nothing **–** This alternative is not recommended. Under this alternative, Helms would simply be run until one of the major components fails and is unable to be repaired. This alternative results in achieving none of the benefits Helms provides as listed in the Benefits section.

Alternative 1: Lifecycle Replacement of All Units – This is the recommended alternative if the CPUC does not approve PG&E's proposal in A.23-12-014 (Alternative 2 below). This alternative would allow PG&E to continue to operate Helms realizing the benefits listed above in the Benefits section. This alternative will maintain a generation output of 404 MW per unit.

Alternative 2: Uprate All Units to Maximum Feasible Capacity – This is the recommended alternative if the CPUC approves PG&E's proposal in A.23-12-014. This alternative would uprate the three Helms units to the maximum feasible output while maintaining a large operating band and operational reliability. This would be accomplished as PG&E has described in A.23-12-014. If the CPUC approves PG&E's uprate proposal in A.23-12-014, then PG&E will withdraw these Helms Incremental Lifecycle Replacement projects from the 2027 GRC.

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Project Summary

Project Title: Helms – Install Backup Power at Portal

Major Work Categories: 2P
Planning Order Numbers: 5783123
Project Start Date: 2019
Project Completion Date: 2029
Operative Date (only applies to Capital): November 2028

Project Description

In the event of a Public Safety Power Shutoff (PSPS) or a three-unit outage, there is currently no reliable backup power source available for the dewatering pumps and station services at the Helms Pump Storage Projects (PSP). Given that Helms operates as an underground facility, ensuring the functionality of these pumps and services is critical for both life safety and overall facility safety. Furthermore, the rental of a 2.5MW generator during such incidents incurs significant costs and necessitates extensive support from PG&E's general construction crew and engineering team, while also occupying a substantial amount of laydown space on the top floor of the powerhouse.

The project scope is to install a new 2.5MW 3-Phase backup generator at the entrance to Helms PSP. The project scope encompasses the replacement of regulator transformers, the installation of both a step-up and a step-down transformer, and the construction of a new pre-engineered building to accommodate the generator and related electrical components. Additionally, the refurbishment of the deicing system at the entrance of Helms PSP will be included.

Justification

Renting a generator of this size requires heavy planning, time, cost, and still requires the tie-in capabilities. There are four (4) dewatering pumps, each at 500HP and two (2) sump pumps each at 200HP which are all fed from load centers 3 & 4. These load centers may be fed as an auxiliary load off one of the three units, if needed, but are typically powered from an auxiliary 21kV line. In the event that all three units are down and service from the 21kV line is interrupted, there is no way for the plant to power the dewatering pumps and sump pumps or provide power to the station services.

Cost

The cost assumptions for this project are based on the professional judgment of the engineers familiar with this type of work, historic PG&E cost data for similar work and secured proposal cost from vendors, constructors, and industry professionals along with estimated installation overheads.

Major Project Spending Estimates
(Thousands of Nominal Dollars)

CAPITAL

Planning Order	Description	Operative Date	2024 CWIP	2025 Forecast	2026 Forecast	2027 Forecast	2028 Forecast	2029 Forecast	2030 Forecast	CWIP + 2025 - '30 Total
5783123	Helms – Install Backup Power at Portal	July 2030	3,380	1,332	790	2,413	4,688	461		**13,063**

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Benefits

Performing this project will eliminate reoccurring expense cost for renting and setting up a portable generator for each three-unit outage. It will also provide backup power to the powerhouse during PSPS events where the powerhouse will be limited to only one source of power for station lights and dewatering pumps. It will also allow for the space that is needed for working on critical equipment such as the turbine shutoff valves (TSVs).

Alternatives Considered

Status Quo: Do nothing – This alternative is not recommended. This alternative requires an emergency rental generator to be placed in the powerhouse during an outage and will not allow for the space that is needed for working on critical equipment such as the TSVs.

Alternative 1: Install new backup generator – This is the recommended alternative. Installing a new backup generator increases reliability of power generation and eliminates further spend of expense dollars on renting a portable generator.

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Project Summary

Project Title: Helms – Repairs to Dewatering & Sump Pumps

Major Work Categories: 2P
Planning Order Numbers: 5805958
Project Start Date: 2023
Project Completion Date: 2027
Operative Date (only applies to Capital): October 2027

Project Description

The Helms pumped storage facility's dewatering pump (DWP) and emergency sump pumps are nearing the end of their service life after decades of operation. The critical nature of these components necessitates a prompt response to prevent operational disruptions and maintain plant safety. The scope of work for this project includes the evaluation and procurement of replacement pumps, with the integration of variable frequency drive (VFD) controlled systems for enhanced operational control. The project will involve assessment of the existing pumps by Engineer of Record (EOR), consideration of alternatives, and execution.

Justification

Helms PSP is an underground facility. Failure to replace the dewatering and sump pumps could result in uncontrolled water levels damaging equipment, disrupting power generation, and safety hazards to the facility, such as the powerhouse filling with water. The role these pumps play in managing plant drainage and emergency water scenarios necessitates the need for action. The replacement of the pumps is imperative in preventing uninterrupted operations and compliance with safety regulations.

Cost

The cost assumptions for this project are based on the professional judgment of the engineers familiar with this type of work and secured proposal cost from vendors, constructors, and industry professionals along with estimated installation overheads.

Major Project Spending Estimates
(Thousands of Nominal Dollars)

CAPITAL

Planning Order	Description	Operative Date	2024 CWIP	2025 Forecast	2026 Forecast	2027 Forecast	2028 Forecast	2029 Forecast	2030 Forecast	CWIP + 2025 - '30 Total
5805958	Helms – DWP and Sump Pump Repairs	October 2027	403	1,387	142	1,133				**3,064**

Benefits

The pumps will be replaced to mitigate risks to the facility’s continuous operation and safety. The pumps are used to maintain drainage and manage water from various sources, including leakage and emergency scenarios. Their replacement will ensure the safety and reliability of plant operations. Replacement of the pumps is required to mitigate the risks of unscheduled outages and to ensure the safety of facility employees and the reliability of the plant resulting in a replacement power cost savings for customers and customer saving associated with Helms being able to take energy from the CAISO during low priced time periods to pump water allowing Helms to be available to generate during high energy priced time periods. This project also reduces the potential for future O&M expense cost increases associated with maintaining these aging pumps.

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Alternatives Considered

Status Quo: Do nothing – This alternative is not recommended. It assumes that no action is taken. This alternative does not address the safety hazard and does not assure the reliability of the plant resulting in a replacement power cost savings for customers. This alternative also does not address the future O&M expense cost increases associated with maintaining these aging pumps.

Alternative 1: DWP and Sump Pumps Replacements – This is the recommended alternative. Replacement of the pumps is required to mitigate the risks of unscheduled outages and to ensure the safety of facility employees and the reliability of the plant resulting in a replacement power cost savings for customers. This alternative also addresses the future O&M expense cost increases associated with maintaining these aging pumps.

Alternative 2: Repair the Existing DWP and Sump Pumps - This alternative is not recommended since the existing pumps have reached the end of their useful lives. This alternative does not address the future O&M expense cost increases associated with maintaining these aging pumps.

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Project Summary

Project Title: Helms – Replace Gen CO_2 Fire System

Major Work Categories: 2L
Planning Order Numbers: 5802281
Project Start Date: 2023
Project Completion Date: 2025
Operative Date (only applies to Capital): December 2025

Project Description

PG&E is replacing the Carbon Dioxide Fire Suppression Systems in underground powerhouses as they pose safety concerns in the event of a carbon dioxide discharge with carbon dioxide traveling to unintended occupied spaces. The carbon dioxide fire suppression system at Helms will be replaced with Vortex Hybrid (Nitrogen / Water Mist) System (re: CAP 122168403) as specified in National Fire Protection Association (NFPA) 770.

Justification

To mitigate the life safety hazard potential with the existing carbon dioxide fire suppression system it will be replaced with a system that removes the potential for serious injury or death by carbon dioxide inhalation/suffocation in the event of a fire in the Helms underground powerhouse. The Victaulic Vortex Hybrid Fire Extinguishing System being proposed will extinguish the fire and maintain a safe breathing environment for staff in the facility. A similar Victaulic system has been installed in the Haas powerhouse and will be installed in the K2 powerhouse.

Cost

The cost assumptions for this project are based on the professional judgment of the engineers familiar with this type of work and secured proposal cost from vendors, constructors, and industry professionals along with estimated installation overheads.

Major Project Spending Estimates
(Thousands of Nominal Dollars)

CAPITAL

Planning Order	Description	Operative Date	2024 CWIP	2025 Forecast	2026 Forecast	2027 Forecast	2028 Forecast	2029 Forecast	2030 Forecast	CWIP + 2025 - '30 Total
5802281	Helms – Replace Gen CO2 Fire System	December 2025	2,562	586						**3,148**

Benefits

The benefit of this project is that it maintains generator fire protection as a safeguard to preserve assets against fire damage consistent with NFPA standards and it mitigates the current safety risk by eliminating the use of carbon dioxide inside the powerhouse.

Alternatives Considered

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Status Quo: Do nothing – This alternative is not recommended. It assumes no action is taken. This alternative was not considered as it does not remove the safety hazard.

Alternative 1: Replace CO_2 Fire System – This is the recommended alternative. PG&E evaluated the use of potential alternatives to carbon dioxide for generator fire suppression, ultimately deciding on the Hybrid (Nitrogen & Water Vapor) System. This alternative provides the ability to safeguard assets consistent with NFPA standards without compromising the generators return to service in the event of discharge associated with a water deluge, or the cost and safety concerns related to updating and maintaining the antiquated CO2 system.

Alternative 2: Delay Replacement of CO_2 Fire System by One Year - This alternative assumes the project is rescheduled by one year and is not recommended. This alternative ultimately has the same long-term benefits as the recommended alternative; however, in the short-term, this alternative is not recommended for the same reasons discussed in status quo.

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Project Summary

Project Title: Helms – Replace 13.8kV Breakers

Major Work Categories: 2M
Planning Order Numbers: 5783125
Project Start Date: 2019
Project Completion Date: 2027
Operative Date (only applies to Capital): March 2027

Project Description

The Helms 13.8kV Breakers have failed to operate in the past. These breakers are a safety risk to Helms personnel and a reliability risk for the Helms Powerhouse.

The project scope will be to replace one of the Helms Powerhouse 13.8kV breakers and enclosures to improve reliability and safety by using compatible Asea Brown Boveri (ABB) medium voltage vacuum circuit breaker and install an arc quenching system to comply with Institute of Electrical and Electronics Engineers (IEEE) C37.20.7 to make it an arc safe system.

Justification

The Helms PSP 13.8kV enclosure and breakers are original to the plant and contain two breakers that feed power to either the 13.8kV common bus or to the unit starting motor for pump starts. There are three separate unit specific enclosures that house two breakers per unit (52-1,2,3 and 52SM-1,2,3). The breakers have exceeded their lifespan and have been historically problematic. Replacing the breakers with more reliable versions that can be interchangeable with the adjacent switchgear for the Station Service and unit exciter transformer would increase plant reliability. However, replacing the breakers requires replacing the enclosure as well. New enclosure installations require compliance with IEEE C37.20.7 to make it an arc safe system. The two forms of arc safe applications are mechanical venting (plenum) of arc flash byproducts (molten copper and toxic gasses) or an arc quencher system. The plenum system is not a feasible option because Helms is an underground facility and has no way to vent the gasses and flash byproducts which is why the project will be installing an arch quenching system.

Cost

The cost assumptions for this project are based on the professional judgment of the engineers familiar with this type of work, historic PG&E cost data for similar work and secured proposal cost from vendors, constructors, and industry professionals along with estimated installation overheads.

Major Project Spending Estimates
(Thousands of Nominal Dollars)

CAPITAL

Planning Order	Description	Operative Date	2024 CWIP	2025 Forecast	2026 Forecast	2027 Forecast	2028 Forecast	2029 Forecast	2030 Forecast	CWIP + 2025 - '30 Total
5783125	Helms Replace 13.8kV Breakers	March 2027	668	757	1,873	313				3,611

PACIFIC GAS AND ELECTRIC COMPANY
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Project Summary

Benefits

- A higher level of personnel safety in this underground powerhouse by bringing the breakers into compliance with the IEEE C37.20.7 standard.
- Potential avoidance of future O&M expense cost increases associated with maintaining this aging equipment.
- A higher level of power generation reliability resulting from a reduction in forced outages caused by this aging equipment. This results in a replacement power cost savings for customers and customer savings associated with Helms being able to take energy from the CAISO during low priced time periods to pump water allowing Helms to be available to generate during high energy priced time periods.

Alternatives Considered

Status Quo: Do Nothing – This is not a feasible option. It does not address the safety issue with the current breakers. It also does not address the future O&M expense cost increases associated with maintaining this aging equipment. It does not address the forced outages caused by this aging equipment and the resulting replacement power cost for customers.

Alternative 1: Repair the Breakers – This alternative is not recommended due to the age of the existing breakers.

Alternative 2: Refurbish – This alternative is not recommended due to the age of the existing breakers.

Alternative 3: Replace – This is the recommended alternative. This alternative replaces the breakers and enclosures to improve reliability and safety by using compatible ABB AMVAC breakers and installing an arc quenching system to comply with IEEE C37.20.7 to make it an arc safe system. This alternative results in a higher level of personnel safety; potential avoidance of future O&M expense cost increases associated with maintaining this aging equipment; and a higher level of power generation reliability resulting from a reduction in forced outages caused by this aging equipment and the resulting replacement power cost savings for customers.

Alternative 4: Retire – This alternative is not recommended since the breakers are necessary for powerhouse function. Helms provides a great value to customers. It would be short sighted to retire Helms rather than replacing these breakers.

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Project Summary

Project Title: Helms Replace 230KV Cables and Cable Fire System Refurbishment

Major Work Categories: 2M
Planning Order Numbers: 5806620, 5810358
Project Start Date: 2027
Project Completion Date: 2030
Operative Date (only applies to Capital): 5806620 – October 2029; 5810358 – December 2030

Project Description

The purpose of 230KV cables is to transmit the power to the grid that is generated by the Helms units when the units are operating in the generating mode and to deliver power from the grid to the Helms units when the units are operating in the pumping mode. Since the Helms units are located underground, the 230KV cables are routed through an elevator shaft that extends between the underground Helms units and the ground-level switchyard. The 230KV oil filled cable fire protection system (fire system) that is in the elevator shaft where the 230KV cable resides has degraded over time. This fire system is required for safety purposes since the existing 230kv cables are filled with oil in order to provide the necessary electrical insulation. The fire system and 230KV cables have been in service for over 40 years. The fire system is significantly corroded and contains heavy deposits. The scope of work will include a thorough review of the existing fire system, a formal engineering analysis of alternatives, system engineering, procurement, and construction. The specific scope could change upon completion of the formal engineering analysis of alternatives.

Justification

These projects have been identified by PG&E as high priority safety projects. The existing equipment in question is original equipment from 1984 and has been aging and deteriorating for years. Replacement recommendations have come both from internal resources and external 3rd party fire safety firms. The value for these projects is based on dramatically reducing the chances of a catastrophic fire in the powerhouse should the 230kv oil filled cables insulation fail, and the existing fire system does not operate correctly. Issues with the cables or a catastrophic fire would force the powerhouse offline and or dramatically reduce power generation. This would result in higher customer costs for replacement power.

Cost

The cost assumptions for these projects are based on the professional judgment of the engineers familiar with this type of work. Costs are based on rough order of magnitude and AACE class 5 estimates. Costs are subject to change pending completion of formal engineering analysis of alternatives. Costs are broken out into two buckets, one reflecting the complete replacement of the existing fire system and the other a complete 230kv cable replacement. It is possible that replacement of the complete 230KV cable may result in the elimination of the need for the cables to be oil filled. The best path forward will not be known until the 230kv cable testing is completed in 2025.

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Project Summary

Major Project Spending Estimates
(Thousands of Nominal Dollars)

CAPITAL

Planning Order	Description	Operative Date	2024 CWIP	2025 Forecast	2026 Forecast	2027 Forecast	2028 Forecast	2029 Forecast	2030 Forecast	CWIP + 2025 - '30 Total
5806620	Helms PSP 230KV Cable Fire System Refurb	October 2029				143	1,147	2,080	70	3,440
5810358	Helms U1-2-3 Replace kV Cables					119	229	1,560	2,343	4,251

Benefits

- A higher level of personnel safety in this underground powerhouse.
- Potential avoidance of future O&M expense cost increases associated with maintaining this aging equipment.
- A higher level of power generation reliability resulting from a reduction in forced outages caused by this aging equipment. This results in a replacement power cost savings for customers.

Alternatives Considered

Status Quo- Do nothing. Results in a lower level of safety for personnel working in this underground powerhouse, an increase in future O&M expense costs associated with maintaining this aging equipment and a higher level of forced outages resulting in a higher level of replacement power costs for customers.

Alternative 1: Replace (recommended) – Installation of new fire system and/or new 230KV cables that are not oil- filled.

Alternative 2: Reschedule by One Year – This alternative assumes the project is rescheduled by one year. This alternative ultimately has the same long-term benefits as the recommended alternative; however, in the short-term, this alternative is not recommended for the same reasons discussed in status quo.

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Project Summary

Project Title: Helms – Replace Low-Level Outlet Bypass Valve at Courtright Dam

Major Work Categories: 2N
Planning Order Numbers: 5779207
Project Start Date: 2021
Project Completion Date: 2026
Operative Date (only applies to Capital): December 2025

Project Description

Helms is located east of Fresno on the North Fork of the Kings River. The system includes two reservoirs, two intake/discharge structures, tunnels, penstocks and the powerhouse.

The 24" low-level outlet (LLO) emergency bypass upstream valve for the Courtright Dam has reached the end of its life expectancy and is currently frozen in the closed position and cannot be operated. Failure of the upstream and downstream valves in the open position will result in an uncontrolled release from Courtright Reservoir.

The project scope is to replace the frozen upstream bypass valve and the redundant downstream valve. While the downstream valve is still operational it is being replaced with a more reliable butterfly valve. Additionally, it is more economical to replace the downstream valve while the equipment and crews are onsite to avoid added mobilization cost. Replacement of these valves will require the use of divers to install a custom line plug to control the flow of water while the valves are out of service.

Justification

The 24" LLO emergency bypass upstream valve is stuck in the closed position and cannot be operated. In addition, water is starting to leak through the top of the valve bonnet. It is critical to complete this project to avoid an uncontrolled water release. Both Division of Safety of Dams (DSOD) and the Federal Energy Regulatory Commission (FERC) are supportive of this project.

Cost

The cost assumptions for this project are based on the professional judgment of the engineers familiar with this type of work, historic PG&E cost data for similar work and secured proposal cost from vendors, constructors, and industry professionals along with estimated installation overheads.

Major Project Spending Estimates
(Thousands of Nominal Dollars)

CAPITAL

Planning Order	Description	Operative Date	2024 CWIP	2025 Forecast	2026 Forecast	2027 Forecast	2028 Forecast	2029 Forecast	2030 Forecast	CWIP + 2025 - '30 Total
5779207	Helms: Replace Courtright LLO Bypass Valve – DOE	December 2025	2,137	511						2,648

Benefits

- Ensures safe operations at Helms by avoiding the possibility of an uncontrolled water release.
- Ensures Helms delivers a higher level of power generation reliability resulting from a reduction in forced outages caused by this aging equipment. This results in a replacement power cost savings for customers and customer savings associated with Helms being able to take energy from the CAISO during low priced

time periods to pump water allowing Helms to be available to generate during high energy priced time periods.

Alternatives Considered

Status Quo: Do nothing – This alternative is not recommended. This alternative may result in an uncontrolled water release. It also may result in a lower level of power generation reliability resulting from an increase in forced outages caused by this aging equipment. This results in a replacement power costs for customers and additional customer costs associated with Helms being unable to take energy from the CAISO during low priced time periods to pump water and being unable to be available to generate during high energy priced time periods.

Alternative 1: Repair – This alternative is not recommended. The valve is over 40 years old and has reached its end of life. Repairing the valve is not feasible due to the availability of parts.

Alternative 2: Refurbish – This alternative is not recommended as it is far more economical to simply install new valves. Access to the site is very limited so getting the proper tooling and materials to the site for a refurbishment is not feasible. Additionally, it is not common practice in the industry to refurbish these types of valves.

Alternative 3: Replace – This is the recommended alternative. Replacing the valves ensures safe operations at Helms by avoiding the possibility of an uncontrolled water release. This alternative also ensures Helms delivers a higher level of power generation reliability resulting from a reduction in forced outages caused by this aging equipment. This results in a replacement power cost savings for customers and customer saving associated with Helms being able to take energy from the CAISO during low priced time periods to pump water allowing Helms to be available to generate during high energy priced time periods.

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Project Summary

Project Title: Helms Relicensing and/or License Conditions

Major Work Categories: 3H
Planning Order Numbers: 5779438, 5812235
Project Start Date: 2020
Project Completion Date: 5779438 – 2029, 5812235 – 2033
Operative Date (only applies to Capital): 5779438 – March 2029, 5812235 – December 3032

Project Description

The Helms Pumped Storage Project FERC 2735 is a three-unit pumped storage powerhouse located in the Kings River watershed. The Helms powerhouse has a normal operating capacity of 1212 MW.
The current Project license expires in 2026. This relicensing project is expected to result in the Company obtaining a new long-term Federal Energy Regulatory Commission (FERC) license for the Project, which will allow PG&E to continue to provide safe and reliable electric generation to our customers in a responsible and environmentally sensitive manner. FERC's Traditional Licensing Process is being used to obtain a new 50-year operating license. The Final Application for New License was filed with FERC on April 19, 2024. When the license expires in 2026, the Project will operate under annual licenses until a new license is issued by FERC consistent with completion of both federal and state-level environmental review processes.

Justification

Under the Federal Power Act (FPA), the owner of a hydropower project must obtain a license from FERC to operate its project. At the end of the license term, a licensee may apply to relicense its project. The FPA and FERC's implementing regulations specify a comprehensive and rigorous process a licensee must complete to successfully renew its license. The minimum 5-year regulatory process, which often takes substantially longer to complete, includes extensive stakeholder involvement, performance of comprehensive resource studies and balancing of complex societal and environmental issues. Licensees must be highly engaged with stakeholders and plan relicensing activities prior to the relicensing process beginning with filing of a Notice of Intent and Pre-Application Document and must continue relicensing activities through filing the License Application and subsequent environmental review processes leading to issuance of the new license by FERC. The schedule for issuance of a new license is generally uncertain and can take decades.

This relicensing project is a climate-informed investment that is supported by a design standard that has been updated using climate projection data about future operating conditions or other climate-informed analysis. For more information on what climate resilience means at PG&E, where PG&E is in its journey to build climate resilience, and the relationship between this General Rate Case filing and PG&E's climate resilience journey, see Exhibit (PG&E-2), Chapter 1.

Cost

The cost assumptions for these projects are based on the professional judgment of the engineers and licensing professionals familiar with this type of work and historic PG&E cost data for similar work.

The new FERC License Conditions are uncertain until the license is issued by FERC; however, the cost forecasts are based study results and discussions held with the regulatory agencies and stakeholders throughout the relicensing process, and on the Company's experience with implementing recent similar License conditions.

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Project Summary

Major Project Spending Estimates
(Thousands of Nominal Dollars)

CAPITAL

Planning Order	Description	Operative Date	2024 CWIP	2025 Forecast	2026 Forecast	2027 Forecast	2028 Forecast	2029 Forecast	2030 Forecast	CWIP + 2025 - '30 Total
5779438	FERC #2735 – Helms Relicensing	March 2029	13,650	3,036	2,558	2,225	1,695	1,767		**24,931**
5812235	Helms Relicensing – Capital LC	December 2032							17,025	**17,025**

Benefits

The benefit of this project is to obtain new FERC license for the Helms Pumped Storage FERC Project so that PG&E can continue to operate these powerhouses to benefit customers and the general public.

Alternatives Considered

Status Quo: Do nothing - This alternative is not recommended. Under this alternative, PG&E would simply abandon the FERC licensing process that has already begun. The result of which would be PG&E's current FERC license not being renewed, and PG&E would not be able to continue operating the Helms Pump Storage powerhouse. If PG&E would choose to continue to operate, exorbitant fines from FERC would be incurred and potentially risking PG&E's good standing with FERC.

Alternative 1: Continue to license the Helms Project and plan to implement the license conditions – This is the recommended alternative. Under this alternative, PG&E customers and the general public would continue to receive all the benefits of the Helms Project.

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Project Summary

Project Title: Helms - Stabilize Transformer Gallery Ceiling

Major Work Categories: 2P
Planning Order Numbers: 5798384
Project Start Date: 2022
Project Completion Date: 2030
Operative Date (only applies to Capital): December 2029

Project Description

The problem at hand is there is water dripping from fissures in the overhead rock "ceiling" and debris is falling onto operational high voltage 230kV GSU transformers resulting in calcium build-up. This build-up results in additional maintenance expenses and will likely impact the transformers functionality negatively including reducing their life. The existing ceiling of corrugated fiberglass panels anchored to the overhead rock ceiling extend only halfway down the gallery with random panels on the open area placed to help isolated leaks over the top of transformer bushings. This project will design and construct a new ceiling structure with fire resistant panels and a gutter/drainage system over the entire length of the gallery.

Justification

The consequence of not mitigating the current issues with the ceiling will expedite the failure of the GSU transformers critical to supplying power to PG&E customers in the greater Fresno County area. Failure of a GSU transformer will also require a shutdown of the associated unit in the powerhouse for an extended period of time to remove and replace the GSU transformer. In addition, it is important to protect the capital investment of new GSU transformers that are planned to be installed in the future.

Cost

The cost assumptions for this project are based on the professional judgment of the engineers familiar with this type of work and secured proposal cost from vendors, constructors, and industry professionals along with estimated installation overheads.

Major Project Spending Estimates
(Thousands of Nominal Dollars)

CAPITAL

Planning Order	Description	Operative Date	2024 CWIP	2025 Forecast	2026 Forecast	2027 Forecast	2028 Forecast	2029 Forecast	2030 Forecast	CWIP + 2025 - '30 Total
5798384	Helms - Stabilize Xfmr Gallery Ceiling	December 2029	171	-	-	130	713	2,361	45	**3,420**

Benefits

By installing the ceiling to protect the GSU Transformers we will avoid the high capital cost of potentially replacing a GSU transformer in an emergent scenario along with the forced outage associated with the emergent GSU transformer replacement. The new ceiling will result in a higher level of power generation reliability resulting from a reduction in forced outages caused by the aging and inadequate ceiling. This results in a replacement power cost savings for customers and customer savings associated with Helms being able to take energy from the CAISO during low priced time periods to pump water allowing Helms to be available to generate during high energy priced time periods.

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Project Summary

Alternatives Considered

Status Quo: Do Nothing - This alternative is not recommended. The existing ceiling does not cover the entire gallery, leaving gaps in coverage and the panels would not meet fire protection recommendations. This alternative could result in a high capital cost of potentially replacing a GSU transformer in an emergent scenario along with the forced outage associated with the emergent GSU transformer replacement and the associated replacement power cost savings for customers.

Alternative 1: Design and construct a new ceiling structure – This is the recommended alternative. This new ceiling structure will avoid the high capital cost of potentially replacing a GSU transformer in an emergent scenario along with the forced outage associated with the emergent GSU transformer replacement. The new ceiling will result in a higher level of power generation reliability resulting from a reduction in forced outages caused by the aging and inadequate ceiling resulting in a replacement power cost savings for customers.

Alternative 2: Repair existing ceiling structure – This alternative is not recommended since it would not mitigate the fire resistivity of the panels or add coverage to the remainder of the gallery.

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Project Summary

Project Title: Helms - Switchyard Emerg Access/Elevator

Major Work Categories: 2M
Planning Order Numbers: 5758136
Project Start Date: 2017
Project Completion Date: 2027
Operative Date (only applies to Capital): October 2027

Project Description

There is a 1040-foot shaft elevator at the Helms Pumped Storage Project (PSP) that was originally installed in 1979. This elevator shaft goes between the underground powerhouse control room up to and 230kV switchyard that is situated above ground. Over the years, the elevator has become more and more problematic. A decision was made to remove the elevator from service in the early to mid-1990. This project will engineer and construct a workable elevator in the existing elevator shaft that meets code requirements and will allow access to the switchyard from the powerhouse.

Justification

The Helms Emergency Switchyard (SY) Access Elevator has been out of service since the early-mid 1990's. Currently, the only way to access the Helms SY from the Helms Control Room is via 1000+ ft of stairs or by driving a vehicle from the powerhouse approximately 9 miles up a winding mountain road. In winter, the driving route is normally closed due to snow so the only way to access it via the road is with a Snow Cat vehicle. This project will return the elevator to safe and reliable service and will re-establish safe access to the switchyard from Helms Powerhouse.

Cost

The cost assumptions for this project are based on the professional judgment of the engineers familiar with this type of work and secured proposal cost from vendors, constructors, and industry professionals along with estimated installation overheads.

Major Project Spending Estimates
(Thousands of Nominal Dollars)

CAPITAL

Planning Order	Description	Operative Date	2024 CWIP	2025 Forecast	2026 Forecast	2027 Forecast	2028 Forecast	2029 Forecast	2030 Forecast	CWIP + 2025 - '30 Total
5758136	Helms – Switchyard Emerg Access/Elevator	October 2027	5,387							**5,387**

Benefits

This project will improve productivity by reducing the amount of time spent traveling between the powerhouse and the switchyard. During the winter months additional productivity will be realized, and safety will be improved by not having to operate the snowcat or clear the road to the switchyard.

Alternatives Considered

Status Quo – This does not meet the objectives of the project or Helms O&M.

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Project Summary

Alternative 1: Repair Existing Elevator – This is not the recommended alternative. The existing elevator has exceeded its useful life and is not in a good enough condition to repair.

Alternative 2: Replace Existing Elevator – This is the recommended alternative. This project improves productivity by reducing the amount of time spent traveling between the powerhouse and the switchyard. During the winter months additional productivity will be realized, and safety will be improved by not having to operate the snowcat or clear the road to the switchyard.

PACIFIC GAS AND ELECTRIC COMPANY
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Project Summary

Project Title: Helms Unit 2 – Draft Tube Gate Improvements

Major Work Categories: 2M
Planning Order Numbers: 5810660
Project Start Date: 2024
Project Completion Date: 2025
Operative Date (only applies to Capital): December 2025

Project Description

This project proposes to replace multiple failed components (Fairing plate, hydraulic cylinders and differential pressure latch (DPL) of the draft tube gate for unit 2 in the powerhouse at Helms Pump Storage Project (PSP) and continue with safe and reliable operations of the Helms Pump Storage Facility.

Justification

Historically, the draft tube gates at Helms PSP have had multiple in-service failures with questionable fixation or latching and structural integrity issues caused by severe cracks that have forced operational outages. Previously, repairs included spot welding of cracks and replacement of minor components on the hydraulic system which only temporarily addressed the failures. During the recent emergency 2024 Spring Outage, it was observed that the draft tube gate on Unit 2 was sagging due to worn hinges. It was also noted that there were severe cracks on the fairing plate and DPL assembly. The complete replacement of these components will reduce the risk of forced outages and potential damages to the main generator.

Cost

The cost assumptions for this project are based on the professional judgment of the engineers familiar with this type of work and historic PG&E cost data for similar work.

Major Project Spending Estimates
(Thousands of Nominal Dollars)

CAPITAL

Planning Order	Description	Operative Date	2024 CWIP	2025 Forecast	2026 Forecast	2027 Forecast	2028 Forecast	2029 Forecast	2030 Forecast	CWIP + 2025 - '30 Total
5810660	Helms U2 DTG Improvements	December 2025	1,923	867						**2,790**

Benefits

- Potential avoidance of future O&M expense cost increases associated with maintaining this aging equipment.
- A higher level of power generation reliability resulting from a reduction in forced outages caused by this aging equipment. This results in a replacement power cost savings for customers and customer saving associated with Helms being able to take energy from the CAISO during low priced time periods to pump water allowing Helms to be available to generate during high energy priced time periods.

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Alternatives Considered

Status Quo: Do Nothing – This alternative is not recommended as the current state of the fairing plate and hydraulic cylinders are nearing failure. This could potentially damage to the turbine generator during pump mode. This would also lead to a forced outage of Helms PSP. This results in replacement power costs for customers and customer costs associated with Helms not being able to take energy from the CAISO during low priced time periods to pump water allowing Helms to be available to generate during high energy priced time periods. Also, this alternative does not address the future O&M expense cost increases associated with maintaining this aging equipment.

Alternative 1: Weld cracked components on fairing plate and pressure latch – This alternative is not recommended. It assumes that the weld repairs would temporarily provide structural support. Historically, this has been the chosen path to repair failures but has proven to be ineffective as more cracks are found during each annual inspection. This alternative results in future O&M expense cost increases associated with maintaining this aging equipment. This alternative would also likely lead to an increase in forced outage of Helms PSP. This results in replacement power costs for customers and customer costs associated with Helms not being able to take energy from the CAISO during low priced time periods to pump water allowing Helms to be available to generate during high energy priced time periods.

Alternative 2: Helms U2 DTG Improvement – This is the recommended alternative. Potential avoidance of future O&M expense cost increases associated with maintaining this aging equipment. Replacing the DTG components results in a higher level of power generation reliability resulting from a reduction in forced outages caused by this aging equipment. This results in a replacement power cost savings for customers and customer saving associated with Helms being able to take energy from the CAISO during low priced time periods to pump water allowing Helms to be available to generate during high energy priced time periods.

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Project Summary

Project Title: Helms Unit 2 Governor – Complete Lifecycle Replacement

Major Work Categories: 2M **Planning Order Numbers:** 5809139 **Project Start Date:** 2025
Project Completion Date: 2028
Operative Date (only applies to Capital): March 2028

Project Description

Helms U2 Governor has an outdated programmable logic controller (PLC) and mechanical components that have forced the governor (and unit) to be offline approximately 10 times over the last 3 years. The primary project goal is to replace the governor PLC and other mechanical components directly associated with the governor. Specific required components will be outlined by engineering with the focus of bringing the system up to industry standard and increasing power generation reliability.

Justification

Project justification is based on increasing governor system reliability by bringing it up to industry standards as it has reached its end of life. As the equipment ages, it requires additional maintenance funded by expense and increases the risk of an unplanned outage, reducing power generation reliability (and increasing replacement power costs for customers).

Cost

The cost assumptions for this project are based on the professional judgment of the engineers familiar with this type of work, and historic PG&E cost data for similar work.

Major Project Spending Estimates
(Thousands of Nominal Dollars)

CAPITAL

Planning Order	Description	Operative Date	2024 CWIP	2025 Forecast	2026 Forecast	2027 Forecast	2028 Forecast	2029 Forecast	2030 Forecast	CWIP + 2025 - '30 Total
5809139	Helms, Unit 2 – Gov Comp Lifecycle Replacement	March 2028			116	1,541	1,697			**3,354**

Benefits

- Potential avoidance of future O&M expense cost increases associated with maintaining this aging equipment.
- A higher level of power generation reliability resulting from a reduction in forced outages caused by this aging equipment. This results in a replacement power cost savings for customers and customer savings associated with Helms being able to take energy from the CAISO during low priced time periods to pump water allowing Helms to be available to generate during high energy priced time periods.

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Alternatives Considered

Status Quo: Do nothing – This alternative is not recommended. This alternative assumes that no action is taken other than continued routine maintenance until an unplanned U2 governor failure. An exceptionally long forced outage would occur until new components could be fabricated and installed resulting in additional costs for expedited work and replacement power. This results in an increase in future O&M expense cost associated with maintaining this aging equipment, higher capital costs for the expedited work, and a higher level of forced outages resulting in a higher level of replacement power costs for customers.

Alternative 1: Complete Lifecycle Replacement Project –This is the recommended alternative. This alternative results in the avoidance of future O&M expense cost increases associated with maintaining this aging equipment and a higher level of power generation reliability resulting from a reduction in forced outages caused by this aging equipment. This results in a replacement power cost savings for customers and customer savings associated with Helms being able to take energy from the CAISO during low priced time periods to pump water allowing Helms to be available to generate during high energy priced time periods.

Alternative 2: Reschedule in One Year – This alternative assumes the project is rescheduled in one year. This alternative has the same long-term benefits as the recommended alternative; however, in the short-term, this alternative is not recommended as it increases the risk of unplanned outages and reduced power generation.

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Project Summary

Project Title: Helms – Ventilation System Upgrades

Major Work Categories: 2L
Planning Order Numbers: 5779442 Project Start Date: 2020
Project Completion Date: 2026
Operative Date (only applies to Capital): December 2025

Project Description

The current ventilation system at Helms Pumped Storage Project (Helms) does not supply clean air in the elevator shaft which serves as the emergency exit in the event there is fire that blocks or is in the access tunnel.

The project scope is to improve the ventilation system at Helms by being able to reverse the exhaust fans at the switch yard thus providing fresh air through the elevator shaft. These improvements are intended to increase the operability and functionality of the ventilation system for use in an emergency.

Justification

The ventilation system within the powerhouse tunnels is near end of life and requires upgrading. The basis for this project comes from a third-party study that made recommendations and put forth an improved ventilation system layout. The chosen alternative was estimated to have the highest Net Present Value of all alternatives considered which indicates that it is the most economical alternative.

Cost

The cost assumptions for this project are based on the professional judgment of the engineers familiar with this type of work, historic PG&E cost data for similar work and secured proposal cost from vendors, constructors, and industry professionals along with estimated installation overheads.

Major Project Spending Estimates
(Thousands of Nominal Dollars)

CAPITAL

Planning Order	Description	Operative Date	2024 CWIP	2025 Forecast	2026 Forecast	2027 Forecast	2028 Forecast	2029 Forecast	2030 Forecast	CWIP + 2025 - '30 Total
5779442	Helms Ventilation Upgrade	December 2025	1,366	2,518						**3,884**

Benefits

Completing this project will provide a safe means of evacuating the powerhouse in an emergency event where the primary evacuation route is blocked.

Alternatives Considered

Status Quo: Do Nothing - This is not the recommended alternative since there is no safe means of evacuating the powerhouse in an emergency event where the primary evacuation route is blocked.

Alternative 1: Repair Ventilation System – This alternative is not recommended due to the advanced age of the ventilation system.

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Alternative 2: Refurbish Ventilation System – This alternative is not recommended due to the advanced age of the ventilation system.

Alternative 3: Ventilation Upgrade – This is the recommended alternative. This alternative replaces the ventilation system to provide a safe means of evacuating the powerhouse if an emergency event where the primary evacuation route is blocked.

Alternative 4: Retire Ventilation System – This alternative is not recommended since the ventilation system is necessary for providing a safe means of evacuating the powerhouse in an emergency event where the primary evacuation route is blocked.

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Project Summary

Project Title: Hydro Contingency – Emergent Weather, Seismic, or Wildfire Work

Major Work Categories: AX
Planning Order Numbers: 5247934
Project Start Date: 2019
Project Completion Date: Expense – n.a.
Operative Date (only applies to Capital): Expense – n.a.

Project Description

This program is to fund emergent work on water conveyance facilities. Historically, weather events, seismic events, and wildfires have resulted in unplanned work due to failures of water conveyance facilities. These facility failures are typically corrected by rebuilding canal sections, installing retaining walls or replacing flume sections.

Justification

PG&E's hydro water conveyance facilities are susceptible to damage during severe weather, seismic events and wildfires. Due to the dispersed nature of the hydro water conveyance facilities, they often do not correspond with state-designated disaster areas that may be declared following such events. For these reasons this work is not normally covered through other funding mechanisms such as the Catastrophic Events Memorandum Account (CEMA). Without an emergent work fund, these emergent projects displace other planned work or may result in an extended outage resulting in replacement power costs to customers.

Cost

The cost assumptions for this project are based on the professional judgment of the engineers and licensing professionals familiar with this type of work and historic PG&E cost data for similar work.

Major Project Spending Estimates
(Thousands of Nominal Dollars)

EXPENSE

Planning Order	Description	2025 Forecast	2026 Forecast	2027 Forecast	2025 - '27 Total
5247934	Hydro Contingency: Emergent Weather, Seismic, or Wildfire Work	1,000	1,000	3,000	**5,000**

Benefits

- Funding emergent work will minimize the need to reschedule planned work.
- A higher level of power generation reliability resulting from a reduction in the length of forced outages caused by a water conveyance facility failure. This results in replacement power cost savings for customers.

Alternatives Considered

Status Quo: Remove emergent work funding – This alternative is not recommended. This alternative results in re-scheduling planned work to provide funding for high priority emergent work. The process of putting some projects on hold and re-distributing budget adds cost and outage time resulting in replacement power costs for customers.

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Alternative 1: Continue to Establish Annual Expense Emergent Work Funds – This is the recommended alternative. This alternative provides funding for emergent work based on historical level of such work and allows other funded projects to continue without schedule impacts. This alternative minimizes overall cost and outage time resulting in replacement power cost savings for customers.

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Project Summary

Project Title: James B Black & Iron Canyon Dam Low-Level Outlet – Install Fiber Cable

Major Work Categories: 2M
Planning Order Numbers: 5805969
Project Start Date: 2025
Project Completion Date: 2028
Operative Date (only applies to Capital): March 2028

Project Description

The objective of this project is to establish fiber optic communications:

- Between James B Black (JBB) Powerhouse (PH) to the Iron Canyon Dam,
- Between the Iron Canyon Dam Intake building and the Iron Canyon Dam Low-level Outlet (LLO) Actuators, and
- Between JBB PH and Pit 5 PH

This project will improve the current data communication in a manner that will increase reliability of control operation and monitoring. In addition to fiber cable installation, the project will require new communication hardware and software at each of the facilities to enable effective and reliable communications.

Justification

Pit 5 PH, JBB PH and Iron Canyon Dam LLO Actuators are owned and operated by PG&E. Current data communication among these facilities are unreliable and are causing issues with operations and controls. Current data communication to Pit 5 PH is intermittent causing nuisance alarms. JBB PH penstock differential protection signal is off the Master station. This master station is housed at Pit 5 PH which is not typical and needs to be migrated to JBB PH. Additionally watershed upgrades that are being implemented with new Allen Bradley equipment would have some available capability/features unused without the fiber optic installation between JBB and Iron Canyon (IC) Dam low-level outlet (LLO) actuator. To resolve these operational and control deficiencies, the data communication amongst the three facilities will need to be improved.

Cost

The cost assumptions for this project are based on an estimate received from a third-party engineering firm for the installation of the fiber cable. Other cost assumptions for Internal crew support and oversight are based on professional judgement and historical PG&E cost data for similar work.

Major Project Spending Estimates
(Thousands of Nominal Dollars)

CAPITAL

Planning Order	Description	Operative Date	2024 CWIP	2025 Forecast	2026 Forecast	2027 Forecast	2028 Forecast	2029 Forecast	2030 Forecast	CWIP + 2025 - '30 Total
5805969	JBB & IC LLO Install Fiber Cable	March 2028	18	891	389	2,979	790			**5,066**

Benefits

- Potential avoidance of future O&M expense cost increases associated with maintaining this aging equipment.
- A higher level of power generation reliability resulting from a reduction in forced outages caused by this aging equipment. This results in a replacement power cost savings for customers.

- Decrease environmental risks due to more reliable operator visibility to critical instrumentation such as in steam flow and reservoir level.

Alternatives Considered

Status Quo: Do Nothing - This alternative is not recommended. This alternative would leave the existing system in place and continue to operate. This is not recommended as the data coming from the current data communication among these facilities are unreliable potentially resulting in the forced outages that cause replacement power costs for customers; employee and public safety risks; and environmental risks.

Alternative 1: Install Fiber Cable - This is the recommended alternative. This alternative will result in an increase in generation reliability due to reduction of trips caused by communication issues resulting in replacement power cost savings for customers; increase PG&E employee and public safety; and decrease environmental risks.

Alternative 2: Defer Installation of Fiber Cable 1 Year - This alternative is not recommended. This alternative would defer the installation of fiber cable by one year. This alternative ultimately has the same long-term benefits as the recommended alternative; however, in the short-term, this alternative is not recommended for the same reasons discussed in status quo.

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Project Summary

Project Title: James B Black – Equipment Life Cycle Replacement

Major Work Categories: 2M
Planning Order Numbers: 5778975, 5778976, 5766154, 5768002
Project Start Date: 5778975 - 2020, 5778976 - 2020, 5766154 - 2021, 5768002 - 2023
Project Completion Date: 5778975 - 2025, 5778976 - 2026, 5766154 - 2027, 5768002 - 2026
Operative Date (only applies to Capital): Various; see table below

Project Description

James B. Black (JBB) Powerhouse is a 172 MW facility located on the Pit River in Shasta County, CA. The powerhouse has two 86 MW impulse turbines.
The projects include the replacement of the GSU transformers and governor controls on both Units 1 & 2. The JBB Powerhouse High Voltage Transformer have been in service since 1970. The High Voltage Transformer Program has identified the JBB High Voltage (HV) Transformer Banks 1 and 2 as high priorities in the transformer fleet needing replacement. The Unit 1 Generator Step Up (GSU) transformer was replaced during the outage in Q3 & Q4 of 2024 and is currently in the closeout process. Unit 2 is scheduled for replacement during the 2025 outage.

The JBB Powerhouse Units 1 & 2 governor system is original equipment and is operated by receiving set point adjustments from Pit 5 operations via SCADA (Supervisory Control and Data Acquisition). The current mechanical system will be replaced with a modern Programmable Logic Controller (PLC) digital system.

Justification

The GSU transformers and governor controls are original and are approaching or have exceeded their design life.

Replacement of the GSU transformers and governor control systems will reduce risk of a forced outage and damage to the main generator, aligning with Power Generation's business strategy to provide safe, reliable and affordable energy. Procurement time for new transformers is 2 to 3 years.

Replacement of the governors will allow operations to maintain the desired setpoint, taking the stress off of the entire system. The governor control upgrade supports Pacific Gas and Electric Company's (PG&E) goal of risk reduction as well as brings reliability and modernization to the James B. Black PH. The existing system is difficult to maintain and requires constant tuning. Regular adjustments are required due to worn linkages and levers that operate the cam and valves. The system has slow reaction time, resulting in fluctuation between setpoints when ramping the unit to meet load requirements. The fluctuation of overshooting and overcorrection of the desired setpoint is not efficient and stresses associated equipment. The needle and deflector servos are original equipment that are showing signs of excessive wear and sticking. The consequential result is unbalanced pressure on the turbine, which causes high bearing temperatures and vibration.

Cost

The cost assumptions for this project are based on the professional judgment of the engineers familiar with this type of work, historic PG&E cost data for similar work and secured proposal cost from vendors, constructors, and industry professionals along with estimated installation overheads.

Major Project Spending Estimates

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Project Summary

(Thousands of Nominal Dollars)

CAPITAL

Planning Order	Description	Operative Date	2024 CWIP	2025 Forecast	2026 Forecast	2027 Forecast	2028 Forecast	2029 Forecast	2030 Forecast	CWIP + 2025 - '30 Total
5766154	JBB PH U1 Upgrade Governor Controls	October 2026	1,853	-	6,873	71				**8,797**
5768002	JBB PH U2 Upgrade Governor Controls	March 2026	765	7,625	116					**8,507**
5778975	JBB PH U1 Replace Transformer	December 2025		282						**282**
5778976	JBB PH U2 Replace Transformer	December 2025	2,035	8,097	233					**10,365**

Benefits

- Potential avoidance of future O&M expense cost increases associated with maintaining this aging equipment.
- Potential avoidance of higher capital costs for equipment/system replacement on an expedited basis if any of the major equipment or systems fails.
- A higher level of power generation reliability resulting from a reduction in forced outages caused by this aging equipment. This results in replacement power cost savings for customers.

Alternatives Considered

Status Quo: Do nothing – This alternative is not recommended. The alternative assumes that no action is taken other than minimal maintenance until unplanned failure. The alternative results in a potential of future O&M expense cost increases associated with maintaining this aging equipment. Also, a very long forced outage would occur until new components could be fabricated and installed resulting in additional costs for expedited work and replacement power costs for customers.

Alternative 1: Replace – This is the recommended alternative. This alternative results in a potential avoidance of future O&M expense cost increases associated with maintaining this aging equipment; the potential avoidance of higher capital costs for equipment/system replacement on an expedited basis if any of the major equipment or systems fail; and a higher level of power generation reliability resulting from a reduction in forced outages caused by this aging equipment. This results in replacement power cost savings for customers.

Alternative 2: Repair - This alternative is not recommended due to age and transformer construction (shell type) which makes field repairs impossible.

Alternative 3: Reschedule One Year – This alternative is not recommended. This alternative assumes the projects are rescheduled for one year. This alternative ultimately has the same long-term benefits as the recommended alternative; however, in the short-term, this alternative is not recommended for the same reasons discussed in the status quo.

Alternative 4: Retire - This alternative is not recommended. The transformers and governors are necessary for plant operations.

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Project Summary

Project Title: James B Black Unit 1 and Unit 2 – Replace CT, PT, SA & Bus Ducts

Major Work Categories: 2M
Planning Order Numbers: 5777373, 5781191
Project Start Dates: Unit 1 – 2024, Unit 2 – 2028
Project Completion Date: Unit 1 – 2027, Unit 2 – 2031
Operative Date (only applies to Capital): Unit 1 – December 2026, Unit 2 – December 2030

Project Description

James B. Black (JBB) PH is a 172 MW facility located on the Pit River in Shasta County, CA. It includes two 86 MW impulse turbines. These projects propose to remove and replace the existing current transformers generator and neutral, surge arrestors, potential transformers, and bus ducts at both JBB Powerhouse Units 1 & 2.

Justification

The JBB Powerhouse Unit 1 and Unit 2 current transformers generator and neutral, potential transformers, surge arrestors, and bus ducts are near the end of their useful life and will be replaced.

Cost

Historical data and professional knowledge were used to establish the cost assumptions below.

Major Project Spending Estimates
(Thousands of Nominal Dollars)

CAPITAL

Planning Order	Description	Operative Date	2024 CWIP	2025 Forecast	2026 Forecast	2027 Forecast	2028 Forecast	2029 Forecast	2030 Forecast	CWIP + 2025 - '30 Total
5777373	JBB U1 Replace CT, PT, SA & Bus Duct	December 2026	16	-	1,965	120				**2,101**
5781191	JBB U2 Replace CT, PT, SA & Bus Duct	December 2030					229	2,262	2,140	**4,632**

Benefits

- Potential avoidance of future O&M expense cost increases associated with maintaining this aging equipment.
- A higher level of power generation reliability resulting from a reduction in forced outages caused by this aging equipment. This results in replacement power cost savings for customers.

Alternatives Considered

Status Quo: Do Nothing - This alternative is not recommended. Running these units until one of these components fails would put the units into a forced outage. This forced outage would last until new components could be procured and installed resulting in additional costs for expedited work and excessive customer replacement power costs.

Alternative 1: Refurbish – This alternative is not recommended for the same reasons as the status quo alternative. This alternative would refurbish affected parts only as they failed.

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Alternative 2: Replace CT, PT, SA & Bus Duct - This is the recommended alternative. This alternative results in the avoidance of future O&M expense cost increases associated with maintaining this aging equipment and a higher level of power generation reliability resulting from a reduction in forced outages caused by this aging equipment. This results in replacement power cost savings for customers.

Alternative 3: Reschedule One Year – This alternative is not recommended. This alternative assumes the projects are rescheduled for one year. This alternative ultimately has the same long-term benefits as the recommended alternative; however, in the short-term, this alternative is not recommended for the same reasons discussed in the status quo.

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Project Summary

Project Title: James B Black – Willow Creek Road Stabilization

Major Work Categories: 2P
Planning Order Numbers: 5792563
Project Start Date: 2021
Project Completion Date: 2027
Operative Date (only applies to Capital): October 2026

Project Description

James B. Black (JBB) PH is a 172 MW facility located on the Pit River in Shasta County, CA.
Moderate to severe weather in the area which was previously impacted by forest fires have contributed to the premature failure of roadway in several locations. More sediment than normal from fire damaged area may be clogging drainage pipes and abnormal hydraulic conditions caused by large amounts of sediment likely caused sections of erodible soils to fail along the roadway. The siphon is accessible by foot or helicopter. The Forest Service is requesting to have PG&E restore the road access to the siphon. The Forest Service has rejected PG&E's request to remove the road added to the new FERC license. The site is currently accessible on foot along the roadway and via Helicopter. Vehicle access is limited to the beginning of the roadway only for this reason PG&E is moving forward with a project to construct.

Justification

PG&E is responsible for maintaining paved roadways under Federal Energy Regulatory Commission (FERC) licensing agreements. Additionally, where ownership is maintained by the United States Department of Agriculture (USDA) Forest Service (USFS), this agency also requires that roads be maintained to the assigned maintenance level of the applicable roadway management plans. For PG&E maintained roads outside the FERC boundary there is no mandate, but maintenance is required to ensure continued access to remote facilities.

Cost

Cost estimates are preliminary using project cost data from similar projects. PG&E has performed several road repairs in this area using standard road repair designs. Since design is not complete at the time of this GRC request, real costs estimates cannot be established. Therefore, a high-level estimation looking at the damage / scope and then cross referenced against historical costs of similar repairs is the most current estimate available.

Major Project Spending Estimates
(Thousands of Nominal Dollars)

CAPITAL

Planning Order	Description	Operative Date	2024 CWIP	2025 Forecast	2026 Forecast	2027 Forecast	2028 Forecast	2029 Forecast	2030 Forecast	CWIP + 2025 - '30 Total
5792563	JBB Willow Creek Rd Stabilization	October 2026	363	401	5,749	95				**6,609**

Benefits

- Potential avoidance of future O&M expense cost increases associated with maintaining this deteriorating asset. Restore vehicular access to facilities cut off by severe weather. Reduce hazards associated with driving.
- Ensure continued safe access of generation assets and compliance with FERC Licenses.

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Alternatives Considered

Status Quo (Do Nothing) - This alternative is not recommended given that the age of the roads and the difficulty in safely accessing various PG&E power generation assets. Under this alternative, where ownership is maintained by the USFS, PG&E will not comply with this agency's requirements that roads be maintained to the assigned maintenance level of the applicable roadway management plans. For PG&E maintained roads outside the FERC boundary, the roads would deteriorate to appoint that continued access to remote facilities would not be possible and PG&E would be in violation of its FERC Licenses.

Alternative 1: Repair existing assets - This alternative proposes PG&E does repairs. This alternative is not preferred given that O&M expense cost increases associated with maintaining this aging equipment. This alternative may also jeopardize PG&E's ability to comply with FERC Licenses.

Alternative 2: Replacement with in-kind structures - This alternative will be used for roads that have reached their end of life and need to be replaced. This is cost savings to the customer as standard designs and materials are readily available. This alternative avoids future O&M expense cost increases associated with maintaining this deteriorating asset. This alternative also ensures PG&E is in compliance with its FERC Licenses.

Alternative 3: Replacement with improved roadways and stabilization methods – This alternative applies to roads that have failed due to faulty design, or a change is condition prompting a new design. This could be installing new or larger culverts for drainage, expanding turnouts on roads for safer travels in adverse weather, and/or erosion protection on ground areas that have become unstable due to weather. This alternative avoids future O&M expense cost increases associated with maintaining this deteriorating asset. This alternative also ensures PG&E is in compliance with its FERC Licenses.

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Project Summary

Project Title: Kerckhoff 2 – Generator Rewind and Restack

Major Work Categories: 2M
Planning Order Numbers: 5762329
Project Start Date: 2028
Project Completion Date: 2030
Operative Date (only applies to Capital): March 2030

Project Description

During the 2014 Kerckhoff 2 (K2) outage, it was verified that the generator air gap had decreased significantly in the southwest quadrant from the original construction documentation. The recommended alignment was completed and the resulting plumb measurement of the rotating parts in this optimized position was 1.41 mils/ft of shaft length. This puts the Kerckhoff 2 turbine generator outside the industry recommended tolerances for plumb. To achieve all industry recommended tolerances and decrease likelihood of an extended forced outage, a full realignment of the unit is required. This would likely include a full disassembly of the unit, at which point a rewind and restack would be performed.

Justification

Rewind/restack of this generator will reduce the risk of an in-service failure that would result in an extended forced outage and the resulting replacement power costs for customers.

Cost

The cost assumptions for this project are based on the professional judgment of the engineers familiar with this type of work along with historic PG&E cost data for similar work.

Major Project Spending Estimates
(Thousands of Nominal Dollars)

CAPITAL

Planning Order	Description	Operative Date	2024 CWIP	2025 Forecast	2026 Forecast	2027 Forecast	2028 Forecast	2029 Forecast	2030 Forecast	CWIP + 2025 - '30 Total
5762329	Kerckhoff 2 – Generator Rewind and Restack	March 2030					459	2,080	4,686	**7,225**

Benefits

A higher level of power generation reliability resulting from a reduction in forced outages caused by this aging equipment. This results in a replacement power cost savings for customers.

Alternatives Considered

Status quo – Running the generator until it fails would result in an exceptionally long forced outage (a minimum of two years) resulting in additional capital costs for expedited work and significant replacement power costs for customers.

Alternative 1: Rewind generator – This is the recommended alternative.

Alternative 2: Reschedule one year – Rescheduling the project by one year increases the likelihood of a generator failure before the rewind resulting in an exceptionally long forced outage (a minimum of two years) resulting in additional capital costs for expedited work and significant replacement power costs for customers.

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Project Summary

Project Title: Kerckhoff 2, Unit 1 – Replace Cooling Water System

Major Work Categories: 2M
Planning Order Numbers: 5806541
Project Start Date: 2025
Project Completion Date: 2031
Operative Date (only applies to Capital): December 2030

Project Description

This project replaces the generator's cooling water system to ensure long term reliability of Kerckhoff 2 (K2) Unit 1.

Justification

The Kerckhoff 2 Powerhouse is an underground powerhouse located on the San Joaquin River in Fresno County. It was commissioned in 1984. Kerckhoff 2 has a single 155MW generator and produces an average 316.6 GWH of energy annually. The generator cooling water system is original powerhouse equipment and is reaching its end of life. As the system continues to age the piping will continue to experience internal corrosion negatively impacting the cooling water flows contributing to higher running temperatures which will impact unit reliability if not replaced.

Cost

The cost assumptions for this project are based on the professional judgment of the engineers familiar with this type of work and historic PG&E cost data for similar work.

Major Project Spending Estimates
(Thousands of Nominal Dollars)

CAPITAL

Planning Order	Description	Operative Date	2024 CWIP	2025 Forecast	2026 Forecast	2027 Forecast	2028 Forecast	2029 Forecast	2030 Forecast	CWIP + 2025 - '30 Total
5806541	Kerckhoff 2 - Replace Cooling Water System	December 2030			155	190	183	208	2,999	**3,736**

Benefits

- Potential avoidance of future O&M expense cost increases associated with maintaining this aging equipment.
- A higher level of power generation reliability resulting from a reduction in forced outages caused by this aging equipment. This results in a replacement power cost savings for customers.

Alternatives Considered

Status Quo: Do nothing – This alternative is not recommended. This alternative assumes that no action is taken other than continued routine maintenance. This would result in an increase in forced outages and replacement power costs for customers. This alternative also results in an increase in future O&M expense cost associated with maintaining this aging equipment.

Alternative 1: K2 Replace Cooling Water System: This is the recommended alternative. The result of this alternative is potential avoidance of future O&M expense cost increases associated with maintaining this aging equipment and a reduction in future forced outages resulting in cost savings to customers.

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Alternative 2: Delay Replace Cooling Water System Project by One Year - This alternative is not recommended. This alternative assumes the project is rescheduled in one year. This alternative ultimately has the same long-term benefits as the recommended alternative; however, in the short-term, this alternative is not recommended for the same reasons as stated in the status quo alternative.

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Project Summary

Project Title: Kerckhoff 2 – Replace Turbine Runner

Major Work Categories: 2M
Planning Order Numbers: 5779444
Project Start Date: 2029
Project Completion Date: 2031
Operative Date (only applies to Capital): December 2030

Project Description

The turbine runner at Kerckhoff 2 (K2) was installed over 40 years ago and is nearing its end of life. It has shown signs of increased fatigue, wear, and cracking which is evidenced by the need to perform weld repairs on a routine basis. To inspect and perform weld repairs on all surfaces, the turbine runner must be removed and shipped offsite. It is recommended to replace the existing aging 1983 vintage turbine runner.

Justification

This project is necessary due to the age and criticality of the equipment. If the turbine runner failed before being replaced, K2 would be curtailed or forced out of service. K2 has experienced increased vibration due to turbine runner cavitation that has been caused by the aging turbine runner.

The primary risk factor driving this project is generation reliability. If the turbine runner were to fail, K2 would be forced out of service. The turbine runner is critical to the powerhouse operation, require a lengthy engineering process, has a very long lead time for parts procurement, and the construction window must align with powerhouse planned outages.

Replacing the turbine runner will reduce the likelihood of forced outages, equipment operating range will likely be restored, and future increases in maintenance costs will be avoided.

Cost

The cost assumptions for this project are based on the professional judgment of the engineers familiar with this type of work, and historic PG&E cost data for similar work.

Major Project Spending Estimates
(Thousands of Nominal Dollars)

CAPITAL

Planning Order	Description	Operative Date	2024 CWIP	2025 Forecast	2026 Forecast	2027 Forecast	2028 Forecast	2029 Forecast	2030 Forecast	CWIP + 2025 - '30 Total
5779444	K2 Replace Turbine Runner	December 2030						130	2,811	**2,941**

Benefits

- Potential avoidance of future O&M expense cost increases associated with repairing this aging turbine runner.
- A higher level of power generation reliability resulting from a reduction in forced outages caused by this aging equipment. This results in a replacement power cost savings for customers.

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Alternatives Considered

Status Quo- Do nothing. Not a feasible option, The K2 turbine has surpassed its service life and would eventually run to failure. This results in an increase in future O&M expense costs associated with maintaining this aging turbine runner and a higher level of forced outages resulting in a higher level of replacement power costs for customers.

Alternative 1: Refurbish – Refurbishing the existing turbine runner will ensure better reliability and efficiency of the unit, however, this option will result a longer planned outage duration because of the necessary time to remove the turbine runner, refurbish it, and reinstall it back into the powerhouse. This option also leaves PG&E open to many turbine runner integrity unknowns which can increase repairs cost and eventually lead to replacement.

Alternative 2: Replace (recommended) – Installation of a new turbine runner will restore efficiency and reliability of the unit.

Alternative 3: Delay Replacement by One Year – This alternative assumes the project is rescheduled by one year. This alternative has the same long-term benefits as the recommended alternative; however, in the short-term, this alternative is not recommended for the same reasons discussed in status quo.

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Project Summary

Project Title: Kerckhoff 2 – Mitigate Arc Flash Bus at 480V Switchgear

Major Work Categories: 2M
Planning Order Numbers: 5792950
Project Start Date: 2021
Project Completion Date: 2027
Operative Date (only applies to Capital): December 2026

Project Description

Kerckhoff 2 Powerhouse is in Fresno County, CA along the San Joaquin River. It is a single unit facility that was commissioned in 1983 and resides in excavated rock chambers. The generator's normal operating capacity is 155MW. The existing 480V AC switchgear and 208/120V AC switchgear are located in the control room. The 480VAC switchgear was manufactured by Powell and is rated for 3000A with a symmetrical fault bus rating of 25kA. The 208/120V AC switchgear is rated for 800A with a symmetrical fault bus rating of 14kA. A short circuit, device coordination, and arc flash study was completed by PG&E's Applied Technology Services (ATS) in April 2020. That study determined the 480V switchgear bus is overstressed during a half-cycle fault condition. This project is a solution to those findings and proposes to replace and relocate the 480v switchgear, 120/208V panel, station bank 1 CLF, station bank 3 & 4, and install new 12kV and 13kV switchgear.

Justification

The Kerckhoff 2 480V switchgear serves critical powerhouse loads such as sump pumps and the motor control center. The K2 Arc Flash Hazard Assessment report from ATS identified the 480V switchgear located in the control room and current limiting fuse (CLF) would be over stressed in the event of a fault. Failure of the 480V switchgear and/or the CLF may result in an electrical fault, causing a forced outage to the powerhouse and/or an arc flash event. Additionally, the existing 480V switchgear located in the control room makes it difficult to maintain safe working distance given its proximity to the operator control panels and annunciators. There is a current Justification for Continued Operations (JCO) in place which this project will mitigate.

Cost

The cost assumptions for this project are based on the professional judgment of the engineers familiar with this type of work, and historic PG&E cost data for similar work.

Major Project Spending Estimates
(Thousands of Nominal Dollars)

CAPITAL

Planning Order	Description	Operative Date	2024 CWIP	2025 Forecast	2026 Forecast	2027 Forecast	2028 Forecast	2029 Forecast	2030 Forecast	CWIP + 2025 - '30 Total
5792950	Kerckhoff 2 – Mitigate Arc Flash 480v	October 2026	451	2,663	1,357					**4,471**

Benefits

- Increased safety to personnel working on and around the equipment in question by reducing the hazard of an arc flash event causing injury to an employee in proximity of the breakers.
- A higher level of power generation reliability resulting from a reduction in forced outages caused by this aging equipment. This results in a replacement power cost savings for customers.

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Project Summary

Alternatives Considered

Status Quo: Do Nothing - This alternative is not viable since the system has been identified in the Arc Flash Hazard Assessment report from ATS that the 480V switchgear located in the control room and current limiting fuse (CLF) would be over stressed in the event of a fault. Failure of the 480V switchgear and/or the CLF may result in an electrical fault, causing a forced outage to the powerhouse and/or an arc flash event with the potential to cause injury.

Alternative 1: Replace and Relocate Equipment – This is the recommended alternative. This alternative proposes to replace and relocate the 480V switchgear out of the control room. The existing 480V switchgear located in the control room makes it difficult to maintain safe working distance given its proximity to the operator control panels and annunciators. This alternative increases safety to personnel working on and around the equipment in question by reducing the hazard of an arc flash event causing injury to an employee in proximity of the breakers. It also results in a higher level of power generation reliability resulting from a reduction in forced outages caused by this aging equipment. This results in a replacement power cost savings for customers

Alternative 2: Build Custom Equipment – This alternative is not recommended. This alternative proposed building custom 480V switchgear to fit just outside of the control room. During review with the manufacturer and engineering the team identified major challenges to make this alternative work within the desired parameters: relocate the switchgear outside of the control room, fit within a similar footprint as to not impede floorspace on the main generator deck, and design for front access only. This alternative was abandoned for Alternative 1.

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Project Title: Kerckhoff 2 - Overhaul Wicket Gates

Major Work Categories: 2M
Planning Order Numbers: 5759145
Project Start Date: 2023
Project Completion Date: 2031
Operative Date (only applies to Capital): December 2030

Project Description

Based on condition assessment it is recommended to replace or completely refurbish the Kerckhoff 2 (K2) facing plates, wicket gates, and all linkages and bushings to ensure long term reliability of Kerckhoff 2 Unit 1.

Justification

The Kerckhoff 2 Powerhouse is an underground powerhouse located on the San Joaquin River in Fresno County commissioned in 1984. Kerckhoff 2 has a single 155MW generator and produces an average 316.6 GWH of energy annually. A January 2020 K2 turbine inspection showed that the wicket gates, liner plates, bushings and linkage bushings are worn and show significant galling which could impact the ability to operate as designed. Several repairs have been made in the past to the original 1984 turbine but has proven to act only as a temporary solution. In order to help ensure continued reliable operations, it is recommended to replace or completely refurbish the K2 facing plates, wicket gates, all linkage and bushings.

Cost

The cost assumptions for this project are based on the professional judgment of the engineers familiar with this type of work and historic PG&E cost data for similar work.

Major Project Spending Estimates
(Thousands of Nominal Dollars)

CAPITAL

Planning Order	Description	Operative Date	2024 CWIP	2025 Forecast	2026 Forecast	2027 Forecast	2028 Forecast	2029 Forecast	2030 Forecast	CWIP + 2025 - '30 Total
5759145	Kerckhoff 2 – Overhaul Wicket Gates	December 2030	227	-	-	-	309	376	2,183	**3,095**

Benefits

- Potential avoidance of future O&M expense cost increases associated with maintaining this aging equipment.
- Potential avoidance of higher capital costs for equipment/system replacement on an expedited basis if any of the major equipment or systems fails.
- A higher level of power generation reliability resulting from a reduction in forced outages caused by this aging equipment. This results in replacement power cost savings for customers.

Alternatives Considered

Status Quo – Do Nothing. This alternative is not recommended. This alternative assumes that no action is taken other than minimal maintenance until an unplanned failure. This alternative results in a potential of future O&M expense cost increases associated with maintaining this aging equipment. Also, a very long forced outage would occur until new components could be fabricated and installed resulting in additional costs for expedited work and replacement power costs for customers.

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Alternative 1: Replace/Refurbish – This is the recommended alternative. This alternative results in a potential avoidance of future O&M expense cost increases associated with maintaining this aging equipment; the potential avoidance of higher capital costs for equipment/system replacement on an expedited basis if any of the major equipment or systems fail; and a higher level of power generation reliability resulting from a reduction in forced outages caused by this aging equipment. This results in replacement power cost savings for customers.

Alternative 2: Reschedule One Year – This alternative is not recommended. This alternative assumes the projects are rescheduled for one year. This alternative ultimately has the same long-term benefits as the recommended alternative; however, in the short-term, this alternative is not recommended for the same reasons discussed in the status quo.

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Project Summary

Project Title: Kerckhoff 2 Replace Generator CO_2 Fire System

Major Work Categories: 2L
Planning Order Numbers: 5751038
Project Start Date: 2017
Project Completion Date: 2027
Operative Date (only applies to Capital): October 2027

Project Description

PG&E is replacing the carbon dioxide fire suppression systems in underground powerhouses as they pose safety concerns. In the event of a carbon dioxide discharge, it can travel to unintended occupied spaces. Through evaluation PG&E is replacing generator carbon dioxide fire suppression systems with Victaulic Vortex Hybrid Systems *(Nitrogen / Water Mist)* as specified in National Fire Protection Association (NFPA) 770.

Justification

PG&E plans to install a new generator fire suppression system at Kerckhoff 2 PH to ensure the system meets applicable standards while maintaining safe and reliable operation. The K2 Generator Carbon Dioxide Fire Protection System does not meet current NFPA Standards and is a safety risk in an underground powerhouse. If there is a carbon dioxide leak, it will go undetected. The gas can migrate to unintended spaces. If carbon dioxide accumulates in human-occupied spaces, it will displace oxygen and create the potential for fatalities.

Cost

The cost assumptions for this project are based on the professional judgment of the engineers familiar with this type of work and historic PG&E cost data for similar work.

Major Project Spending Estimates
(Thousands of Nominal Dollars)

CAPITAL

Planning Order	Description	Operative Date	2024 CWIP	2025 Forecast	2026 Forecast	2027 Forecast	2028 Forecast	2029 Forecast	2030 Forecast	CWIP + 2025 - '30 Total
5751038	Kerckhoff 2 - Replace CO2 System	October 2027			466	6,120				**6,586**

Benefits

The benefit of this project is that it maintains generator fire protection as a safeguard to preserve assets against fire damage consistent with NFPA standards and it mitigates the current safety risk by eliminating the use of CO2 inside the powerhouse.

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Alternatives Considered

Status Quo – do nothing: This alternative is not recommended. This alternative proposes PG&E does nothing. This alternative is not preferred given that the existing CO2 system presents a risk to personnel safety.

Alternative 1: Replace Generator CO2 Fire System - This is the preferred alternative. This alternative maintains generator fire protection as a safeguard to preserve assets against fire damage consistent with NFPA standards and it mitigates the current safety risk by eliminating the use of CO2 inside the powerhouse. PG&E evaluated the use of potential alternatives to CO2 for generator fire suppression and ultimately decided on the Hybrid (Nitrogen & Water Vapor) System. This alternative provides the ability to safeguard assets without compromising the generators return to service in the event of discharge associated with a water deluge, or the cost and safety concerns related to updating and maintaining the antiquated CO2 system.

Alternative 2: Delay Replacement of Generator CO2 Fire System by One Year - This alternative assumes the project is rescheduled by one year and is not recommended. This alternative ultimately has the same long-term benefits as the recommended alternative; however, in the short-term, this alternative is not recommended for the same reasons discussed in status quo.

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Project Summary

Project Title: Kerckhoff Relicensing and/or License Conditions

Major Work Categories: 3H, IG
Planning Order Numbers: Capital – 5760695, 5812236, Expense – 5287168
Project Start Date: 2017
Project Completion Date: 5760695 – 2027, 5812236 **–** 2033, 5287168 – 2027
Operative Date (only applies to Capital): 5760695 – March 2027, 5812236 – December 2032

Project Description

The Kerckhoff Project includes two powerhouses located on the San Joaquin River in Central California. The Kerckhoff powerhouses have a combined normal operating capacity of 180.4 MW.
The current Project license expired in 2022 and the Project currently operates under an annually renewing license. This relicensing project is expected to result in the Company obtaining a new long-term Federal Energy Regulatory Commission (FERC) license for the Project, which will allow PG&E to continue to provide safe and reliable electric generation to our customers in a responsible and environmentally sensitive manner. FERC's Integrated Licensing Process is being used to obtain a new 40 to 50-year operating license. FERC's procedural schedule is forecast to continue beyond the current license expiration date. The Project will operate after that time under annual licenses until a new license is issued by FERC consistent with completion of both federal and state environmental review processes.

The forecast cost includes the work necessary to implement the anticipated license conditions in the new license. License implementation begins when FERC issues a new License.

Justification

Under the Federal Power Act (FPA), the owner of a hydropower project must obtain a license from FERC to operate its project. At the end of the license term, a licensee may apply to relicense its project. The FPA and FERC's implementing regulations specify a comprehensive and rigorous process a licensee must complete to successfully renew its license. The minimum 5-year regulatory process, which often takes substantially longer to complete, includes extensive stakeholder involvement, performance of comprehensive resource studies and balancing of complex societal and environmental issues. Licensees must be highly engaged with stakeholders and plan relicensing activities prior to the relicensing process beginning with filing of a Notice of Intent and Pre-Application Document and must continue relicensing activities through filing the License Application and subsequent environmental review processes leading to issuance of the new license by FERC.

The schedule for issuance of a new license is uncertain and can take decades. Until the new license order has been issued, new license conditions are uncertain; however, the licensee's cost forecasts (capital and expense) are based on engagement with regulatory agencies and stakeholders throughout the relicensing proceeding, National Energy Policy Act (NEPA) and California Environmental Quality Act (CEQA) environmental reviews, regulatory processes, and intermediate steps. Cost estimates to implement new license requirements are refined iteratively throughout the relicensing process based on a growing availability of information.

Due to many layers of regulatory processes, the schedule for FERC's issuance of a New License can be uncertain and subject to authority and activities beyond the licensee's control. A licensee cannot always accurately forecast the scope and costs of license implementation because the measures that will be required are not known in advance and often take years of study of potential impacts before new operating conditions

can be specified. This is why PG&E has requested, and the Commission has approved this work be subject to balancing account treatment.

Cost

The cost assumptions for these projects are based on the professional judgment of the engineers and licensing professionals familiar with this type of work and historic PG&E cost data for similar work.

The new FERC License Conditions are uncertain until the license is issued by FERC; however, the cost forecasts are based study results and discussions held with the regulatory agencies and stakeholders throughout the relicensing process, and on the Company's experience with implementing recent similar License conditions.

Major Project Spending Estimates
(Thousands of Nominal Dollars)

CAPITAL/EXPENSE

Planning Order	Description	Operative Date	2024 CWIP	2025 Forecast	2026 Forecast	2027 Forecast	2028 Forecast	2029 Forecast	2030 Forecast	CWIP + 2025 - '30 Total
5760695	Kerckhoff 1 & 2 Relicensing	March 2027	-	1,120	1,260	394				**2,774**
5812236	Kerckhoff 1 & 2 Relicensing - Capital LC	December 2032				2,863	3,265	11,876	2,634	**20,637**
5287168	Kerckhoff 1&2 Relicensing – Expense LC	n.a.	n.a.			2,000	n.a.	n.a.	n.a.	**2,000**

Benefits

The benefit of this project is to obtain new FERC license for the Kerckhoff FERC Project (P-96) so that PG&E can continue to operate these powerhouses to benefit customers and the general public.

Alternatives Considered

Status Quo: Do nothing - This alternative is not recommended. Under this alternative, PG&E would simply abandon the FERC licensing process that has already begun. The result of which would be PG&E's current FERC license not being renewed, and PG&E would not be able to continue operating the Kerckhoff powerhouses. If PG&E would choose to continue to operate, exorbitant fines from FERC would be incurred and potentially risking PG&E's good standing with FERC.

Alternative 1: Continue to license the Kerckhoff Project and plan to implement the license conditions – This is the recommended alternative. Under this alternative, PG&E customers and the general public would continue to receive all the benefits of the Kerckhoff Project.

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Project Summary

Project Title: Kerckhoff Replace Dam LLO Gates 1-3

Major Work Categories: 2N
Planning Order Numbers: 5788227
Project Start Date: 2020
Project Completion Date: 2027
Operative Date (only applies to Capital): October 2026

Project Description

Past testing and inspections have warranted PG&E to pursue replacement of the low-level outlet (LLO) gates at Kerckhoff Dam. Due to the current condition of LLO Gate Number 1, PG&E is required to provide routine updates to the Federal Energy Regulatory Commission (FERC) specific to project scope and schedule. This project will replace all 3 LLO gates, stems, guides, actuators, and enable remote operation via SCADA.

Kerckhoff Dam



Justification

Kerckhoff Dam has 3 low-level outlet (LLO) gates which are used for reservoir drawdown. To ensure dam safety, PG&E must maintain the functionality of the low-level outlets in order to lower the reservoir in the event of an emergency and or during extreme flow events to avoid overtopping the radial gates. Currently LLO Gate Number 1 has experienced issues and requires repair or replacement. Gate Number 1 is currently considered non-operational but can be opened in an emergency. Gates Number 2 and Number 3 are operational but have the same design characteristics as Gate 1 which possess concern for long term reliability and for this reason it's recommended to replace all 3 low-level outlet gates and associated equipment.

Cost

The cost assumptions for this project are based on the professional judgment of the engineers familiar with this type of work and historic PG&E cost data for similar work. An alternatives analysis was conducted by Black &

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Veatch where it was determined that gate replacement was the best and least costly option to correct Gate Number 1. Within the alternative analysis the team evaluated replacing only the non-operational Gate Number 1 and or all three LLO gates during the same construction effort. Since dive mobilization is a significant cost to the project, PG&E decided to replace all three LLO gates for long term reliability and economies of scale.

Major Project Spending Estimates
(Thousands of Nominal Dollars)

CAPITAL

Planning Order	Description	Operative Date	2024 CWIP	2025 Forecast	2026 Forecast	2027 Forecast	2028 Forecast	2029 Forecast	2030 Forecast	CWIP + 2025 - '30 Total
5788227	Kerckchoff Replace Dam LLO Gate 1	October 2026	539	5,575	4,602	48				**10,765**

Benefits

This project will ensure compliance with FERC and DSOD for the safe and reliable operation of Kerckhoff Dam by ensuring long term reliability of the low-level outlets.

Alternatives Considered

Status Quo: Do nothing – This alternative is not recommended as this is a compliance driven project. Due to the current condition of LLO Gates Number 1, PG&E is required to provide routine updates to FERC regarding project scope and schedule.

Alternative 1: Replace the LLO Gates 1-3 – This is the recommended alternative, which is to replace all 3 LLO gates, stems, guides, actuators, and enable remote operation via SCADA. The alternative provides the most economical approach to mitigate Gate 1 while also ensuring long term reliability for Gates 2 and 3. The new LLO gates will incorporate design changes to correct and mitigate reliability concerns by addressing failure points experienced by Gate Number 1.

Alternative 2: Repair the LLO Gates 1-3 – This alternative is not recommended. Both wet and dry field repairs were considered. After a discussion with gate manufacturers, it was confirmed that a field repair would not be possible due to the complexity of the installation. Additionally, the team explored the option of removing LLO 1 and shipping it to a machine shop for refurbishment. In discussion with the manufacturer, the repair of this cast iron edge, even in a shop environment, is not feasible.

Alternative 3: Replace LLO Gate 1 Only - This alternative is not recommended. Assumes replacing only the non-operational LLO Gate Number 1. As all three gates have the same design and could exhibit similar issues as experienced by Gate 1 and the high cost for contractor mobilization it is recommended to replace all gates at once.

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Project Summary

Project Title: Kilarc Cow Decommissioning

Major Work Categories: IG **Planning Order Numbers:** 5280313 **Project Start Date:** October 2024 **Project Completion Date:** 2034
Operative Date (only applies to Capital): Non-Earnings Expense – n.a.

Project Description

The Kilarc-Cow Creek Hydroelectric Project is a FERC licensed project with two powerhouses located on the Old Cow and South Cow Creeks. The Kilarc-Cow Project has a normal operating capacity of 5 MW.
The long-term FERC license for Kilarc-Cow Creek expired in 2007. PG&E initially began the process of relicensing the project in 2002, but after consulting with resource agencies, PG&E became concerned that environmental mitigation measures likely to be required would render the project uneconomic. Consequently, in 2005, PG&E entered into an agreement with the National Marine Fisheries Services, the US Fish and Wildlife Services, the National Park Service, the California Department of Fish and Wildlife the State Water Resources Control Board, Friends of the River and Trout Unlimited in which it committed not to file a license application with FERC, but instead to surrender the license. In 2009, PG&E submitted a license surrender application to FERC. In October 2024, FERC approved the license surrender application and required PG&E to begin implementing decommissioning activities.
The scope of work is to implement the FERC license surrender order which includes developing and implementing management plans and planning for the physical deconstruction projects to remove the Kilarc Cow Creek facilities.

Justification

Under the Federal Power Act (FPA), the owner of a hydropower project must apply to FERC for a new license two years prior to expiration of the existing license. PG&E did not file its license renewal application by the statutory deadline of March 2005, resulting in the Project entering the FERC "orphaned project" process. FERC solicited the interest of other entities to license the "orphaned" Project, but no other entity timely filed an application to license the Project. Pursuant to FERC regulations, PG&E was ordered by FERC to prepare a License Surrender Application including a decommissioning plan, which was prepared in consultation with the resource agencies and interested parties. PG&E filed the License Surrender Application with FERC in 2009. FERC issued the order approving PG&E's license surrender application in October 2024. PG&E is required to decommission Kilarc Cow Creek hydroelectric project in compliance with this FERC order.

Cost

The cost assumptions for this project are based on the professional judgment of the engineers and licensing professionals familiar with this type of work and historic PG&E cost data for similar work.

Major Project Spending Estimates
(Thousands of Nominal Dollars)

NON-EARNINGS EXPENSE

Planning Order	Description	2025 Forecast	2026 Forecast	2027 Forecast	2025 - '27 Forecast
5280313	Kilarc Cow Decommissioning			16,971	**16,971**

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Project Summary

Benefits

Decommissioning the project ensures that PG&E focuses investment to achieve the most value for its customers.

Alternatives Considered

Status Quo: Do nothing – This alternative is not recommended. It is an irreversible FERC regulatory requirement for PG&E to decommission the Kilarc Cow Project, if PG&E does not do so PG&E will be out of compliance with FERC.

Alternative 1: Develop and submit to FERC a license surrender application and decommissioning plan - This is the recommended alternative. PG&E is required by FERC to implement management plans and physical deconstruction of Kilarc Cow Powerhouse.

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Project Summary

Project Title: Kings River – Replace TSV

Major Work Categories: 2M
Planning Order Numbers: 5798387
Project Start Date: 2021
Project Completion Date: 2025
Operative Date (only applies to Capital): December 2025

Project Description

Kings River Powerhouse (PH) is a single unit PH located in the Haas-Kings Hydroelectric Project on the Kings River. Kings River PH produces an average of about 204 GWh of electricity per year and provides 52 MW of dependable capacity. In addition, Kings River PH provides ancillary services such as load following and voltage support, thereby increasing the value of this resource to California's electric system.

The Kings River PH Turbine Shutoff Valve (TSV) has excessive leakage and has failed to operate in the past. Operations and Engineering has visually identified increased damage on the trunnion sleeves likely due to increased operations and differential pressure issues. This damage and inability to operate the TSV disables the TSV's ability to completely shutoff water from the penstock, preventing the spiral case and turbine pit from remaining completely dewatered during clearances. An attempt to refurbish the TSV with the OEM (Andritz) in 2017 was unsuccessful. In 2021 the Kings River PH was forced out of operation because of the TSV being stuck in the closed position. It is recommended to replace the TSV and associated hardware to return the TSV to reliable operating conditions.

Justification

The Kings River PH Turbine Shutoff Valve (TSV) has excessive leakage and has failed to operate in the past. Operations and Engineering has visually identified increased damage on the trunnion sleeves likely due to increased operations and differential pressure issues.

By replacing the TSV with a new similar valve, including a new bypass assembly and actuator, it will greatly reduce future loss of generation and increase safety downstream of the valve.

Cost

The cost assumptions for this project are based on professional judgment and historic PG&E cost data for similar work.

Major Project Spending Estimates
(Thousands of Nominal Dollars)

CAPITAL

Planning Order	Description	Operative Date	2024 CWIP	2025 Forecast	2026 Forecast	2027 Forecast	2028 Forecast	2029 Forecast	2030 Forecast	CWIP + 2025 - '30 Total
5798387	Kings River - Replace TSV	December 2025	5,612	5,369						**10,981**

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Benefits

The replacement of the existing TSV with a new valve will result in the potential avoidance of future O&M expense cost increases associated with maintaining this aging equipment. In addition, a higher level of power generation reliability will be realized resulting from a reduction in forced outages caused by this aging equipment. This results in a replacement power cost savings for customers. The new TSV will increase personnel safety during clearances (planned outages) by eliminating leakage downstream.

Alternatives Considered

Status Quo: Do nothing – This alternative is not recommended. It does not avoid future O&M expense cost increases associated with maintaining this aging equipment. In addition, it does not address reliability issues resulting from forced outages caused by this aging equipment and the resulting replacement power costs for customers. Finally, it does not address the personnel safety issue during clearances (planned outages).

Alternative 1: Refurbish the existing TSV in-situ – This alternative is not recommended. This is the lowest cost alternative with the shortest expected outage duration. While this alternative could provide improvements in the near term, it is not recommended because the existing valve body, disc, shaft, and other key components would not be replaced. These components have reached the end of their reliable useful lives and significant repair costs and outages are to be expected in the mid to long term. Although refurbishment would be expected to improve the TSV safety, this improvement may only be temporary and would not be comparable to that which would be achieved by replacement. It should also be noted that the cost and outage duration may both increase if additional issues are uncovered once the valves are disassembled. An outage extension would incur additional customer costs due to lost generation. The scope of this alternative is based on field refurbishment only. In situ refurbishment allows for only partial disassembly of the TSV and sharply limits the inspections and corrective work that can be performed.

Alternative 2: Refurbish the existing TSV offsite - This alternative is not recommended. This alternative is a better technical solution than the in-situ refurbishment because the TSV could be completely disassembled in a shop where better and more precise machinery is available to provide a more thorough and complete rehabilitation. Although a shop refurbishment would be a significant improvement over the in-situ alternative, this alternative is not recommended because the existing valve would still be returned to service and any performance and safety improvements achieved would likely be short-lived. The outage duration for shop refurbishment is expected to be longer than Alternative 1 and 3. The unit would be out of service from the time the TSV is removed, shipped to the shop, refurbished and tested, shipped back to the plant, installed and

returned to service. The cost of this alternative is expected to be substantially larger than the in-situ option due to the scope being expanded for the more extensive refurbishment and transporting the TSV between the powerhouse and the shop. The lengthy outage required by the additional scope would be expected to markedly increase the customer costs for replacement power.

Alternative 3: Replace the TSV - This is the recommended alternative. The existing TSV is nearing the end of its useful service life and significant repairs, or complete replacement may become necessary within 5 to 10 years. A new valve would effectively “reset the clock” for another 50-year design life. This alternative will result in the potential avoidance of future O&M expense cost increases associated with maintaining this aging equipment. In addition, a higher level of power generation reliability will be realized resulting from a reduction in forced outages caused by this aging equipment. This results in a replacement power cost savings for customers. The new TSV will also increase personnel safety during clearances (planned outages) by eliminating leakage downstream.

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Project Summary

Project Title: Kings River 2023 Storm Damage Improvements

Major Work Categories: 2P
Planning Order Numbers: 5806358
Project Start Date: 2024
Project Completion Date: 2026
Operative Date (only applies to Capital): October 2026

Project Description

As a result of Winter 2022 through early Spring 2023 storms, the Kings River Powerhouse (PH) sustained multiple areas of damage & erosion, which left access to the PH unsafe and unreliable.

This project will replace a failed spillway, rebuild powerhouse tailrace access road, replace failed culverts, improve erosion mitigation measures and replace failed perimeter fencing to make the powerhouse safe and restore safe, reliable access to the PH a power generation asset. This project improves physical security of the powerhouse, addresses an existing deficiency resultant from storm damage and restores power generation reliability.

Justification

Once completed, this project's scope will provide safe, secure, and reliable vehicle access to the PH which is a critical operational component to responsibly generate power. Future capital projects related to the PSV/TSV changeout will require access to the tailrace, which is currently inaccessible, this project will also address that issue. Full PH access will not be possible without this work being completed.

Work must be pursued immediately to provide access to the Kings River Powerhouse tail race (currently inaccessible) for safe and reliable operations as well as for future outage work.
Safety is a risk due to failed spillway, failed roadway and failed perimeter fencing. Additional months for procuring a permit have been added to the schedule. 12 months have been allotted for DHAC permitting should a 401/404 or another related long timeline permit be required

Cost

The cost assumptions for this project are based on professional judgment of the local engineering and hydro team familiar with this type of work.

Major Project Spending Estimates
(Thousands of Nominal Dollars)

CAPITAL

Planning Order	Description	Operative Date	2024 CWIP	2025 Forecast	2026 Forecast	2027 Forecast	2028 Forecast	2029 Forecast	2030 Forecast	CWIP + 2025 - '30 Total
5806358	Kings River - 2023 Storm Damage Improvements	October 2026	72	248	2,673					**2,993**

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Benefits

The benefits of completing this project are:

- Safe and secure access for operations to perform routine tasks
- Access for the continued operations of the Kings River Powerhouse
- Safe and reliable access for employees and contracts to perform scheduled and emergent work
- Provide an efficient path for water to flow during rain and storm events to protect the powerhouse and its related equipment/facilities

Alternatives Considered

Status quo - Do nothing. Results in an unsafe roadway and spill way putting the powerhouse, substation and related equipment at risk of failure.

Alternative 1: Repair with like in kind – Repair roadway, spillway and eroded areas with like in kind and do not make any improvements. Results in risk of similar and potentially worse damage to the powerhouse and related equipment during a future storm event.

Alternative 2: Improve (recommended) – Improve the spillway, culverts, runoff flow paths and powerhouse drive and roadway. Results in the reduced or eliminated chance of another storm event causing the type of damage or worse than what was caused in the 2023 storm event. Restores reliable and safe access to the powerhouse.

Alternative 3: Reschedule for future years – Reschedule this work for future years. Results in the same long-term benefits but will continue to incur the above-mentioned risks.

PACIFIC GAS AND ELECTRIC COMPANY
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Project Summary

Project Title: Kings River Equipment Life Cycle Replacement

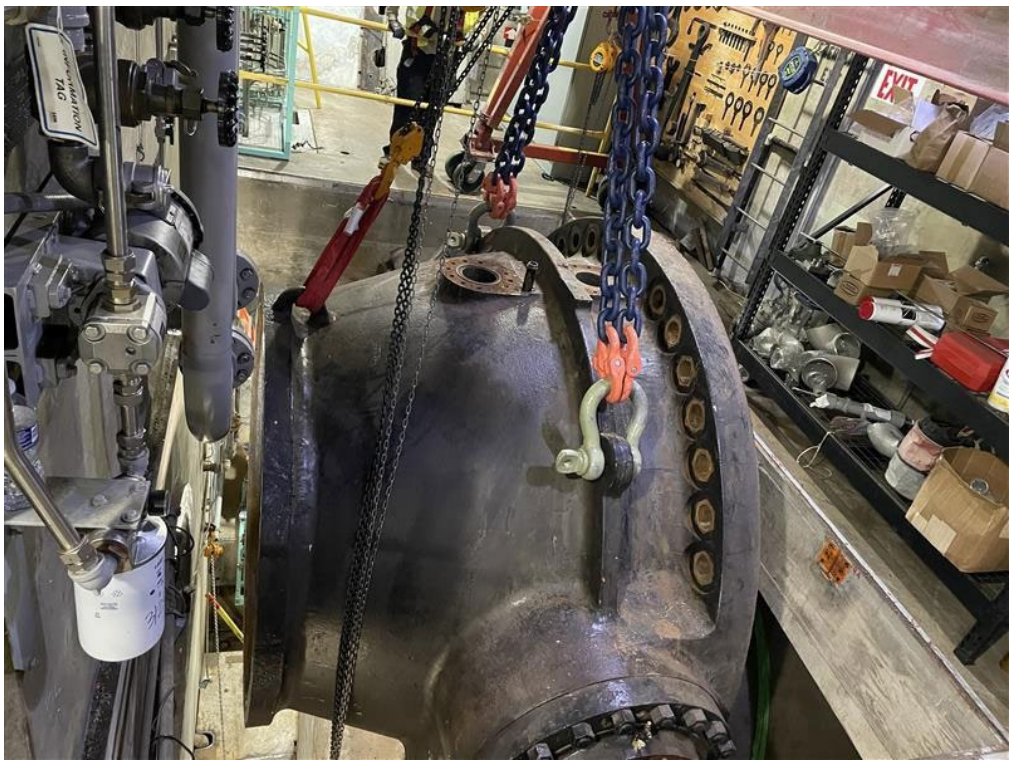
Major Work Categories: 2M
Planning Order Numbers: 5792938, 5812188
Project Start Date: 5792938 – 2023, 5812188 - 2028
Project Completion Date: 5792938 - 2029, 5812188 – 2033
Operative Date (only applies to Capital): 5792938 – October 2028**,** 5812188 – December 2032

Project Description

Kings River Powerhouse (PH) is a single unit PH located in the Haas-Kings Hydroelectric Project on the Kings River. Kings River PH produces an average of about 204 GWh of electricity per year and provides 52 MW of dependable capacity. In addition, Kings River PH provides ancillary services such as load following and voltage support, thereby increasing the value of this resource to California's electric system.

These projects include turbine replacement, wicket gate replacement, servomotor refurbishment, operating assembly refurbishment, generator rewind and restack, rotor pole refurbishment, guide bearing refurbishment, brakes overhaul, air cooler and piping replacement, draft tube repairs, spiral case repairs, annunciator replacement, transformer management relay replacement, upgrade cooling water system, replacement of station service transformer #2, replacement of AC switchgear, replacement of DC switchgear, replacement of tailrace concrete liner, upgrade SCADA controls, repair/replace 3 anchor blocks on siphon and penstock, add oil water separator, replace tailrace gate seals, modify drainage around powerhouse, and replace GSU transformer.

Kings River Turbine Shutoff Valve Inside the Powerhouse



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Underside view of Turbine Shutoff Valve



Justification

Many of the equipment and systems at Kings River Powerhouse are approaching or have exceeded their design life. For example, the GSU has a service life of approximately 40-50 years and been in service since 1965 (60 years). The GSU oil testing shows elevated gas levels in the insulating oil. Failure of the transformer can result in a prolonged forced outage. There is a 4-year lead time for a replacement transformer and there are no readily available spares.

Cost

The cost assumptions for this project are based on the professional judgment of the engineers familiar with this type of work, historic PG&E cost data for similar work and secured proposal cost from vendors, constructors, and industry professionals along with estimated installation overheads.

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Major Project Spending Estimates
(Thousands of Nominal Dollars)

CAPITAL

Planning Order	Description	Operative Date	2024 CWIP	2025 Forecast	2026 Forecast	2027 Forecast	2028 Forecast	2029 Forecast	2030 Forecast	CWIP + 2025 - '30 Total
5792938	Kings River GSU Bank Replacement	October 2028	469	-	426	599	2,530	15		**4,039**
5812188	Kings River Whole Unit Replacement	December 2032					917	1,040	33,323	**35,280**

Benefits

- Potential avoidance of future O&M expense cost increases associated with maintaining this aging equipment.
- Potential avoidance of higher capital costs for equipment/system replacement on an expedited basis if any of the major equipment or systems fails.
- A higher level of power generation reliability resulting from a reduction in forced outages caused by this aging equipment. This results in replacement power cost savings for customers.

Alternatives Considered

Status Quo: Do Nothing - This alternative is not recommended. This alternative assumes that no action is taken other than minimal maintenance until an unplanned failure. This alternative results in a potential of future O&M expense cost increases associated with maintaining this aging equipment. Also, a very long forced outage would occur until new components could be fabricated and installed resulting in additional costs for expedited work and replacement power costs for customers.

Alternative 1: Replace/Refurbish – This is the recommended alternative. This alternative results in a potential avoidance of future O&M expense cost increases associated with maintaining this aging equipment; the potential avoidance of higher capital costs for equipment/system replacement on an expedited basis if any of the major equipment or systems fail; and a higher level of power generation reliability resulting from a reduction in forced outages caused by this aging equipment. This results in replacement power cost savings for customers.

Alternative 2: Reschedule One Year – This alternative is not recommended. This alternative assumes the projects are rescheduled for one year. This alternative ultimately has the same long-term benefits as the recommended alternative; however, in the short-term, this alternative is not recommended for the same reasons discussed in the status quo.

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Project Summary

Project Title: Land Conservation Commitment Compliance Program

Major Work Categories: AB
Planning Order Numbers: 5285612
Project Start Date: 2025
Project Completion Date: N.A. – Project duration is indefinite as this is a perpetual obligation
Operative Date (only applies to Capital): Expense – n.a.

Project Description

Through the implementation of its Land Conservation Commitment (LCC), as ordered by the Commission in D. 03-12-035, PG&E placed Conservation Easements (CEs) on virtually all 140,000 acres of its hydro watershed lands to enable the permanent protection and enhancement of the Beneficial Public Values (BPVs) identified on the watershed lands, including open space, cultural and historic resources, sustainable forestry, public recreation, habitat protection, and agricultural uses. Implementation of the LCC resulted in the donation of approximately 40,000 acres to qualified conservation organizations, with PG&E retaining approximately 100,000 acres. Each CE on the retained lands contains legal rights and obligations for PG&E and the CE Holder, including actions required for the protection of the BPVs and enforcement of the CE requirements. PG&E proposes to implement a program to enable it to manage and fulfill LCC obligations, including ongoing compliance with CE requirements authorized by the Commission.

Justification

This LCC Compliance work is an evolution of LCC Implementation funding authorized in prior GRCs. In prior cases, funding was authorized to enable the donation of fee interests and to donate and incrementally operationalize CE interests in the watershed lands as they were approved by the Commission. PG&E completed implementation of the LCC in mid-2024. Accordingly, the work forecast in this GRC is focused on ongoing compliance with the requirements of CEs and other agreements authorized by the Commission in connection with LCC implementation. The requested funding is related to but separate and distinct from the stewardship funding requested by PG&E's Land Conservation Commitment Team in Exhibit 7, Chapter 5.

CEs on PG&E's hydro watershed lands create legal obligations to perform work that would not otherwise be required but for the existence of the CE. Although each CE uniquely addresses the attributes of the property it covers, the governing structure is consistent among and across PG&E CEs. Key compliance elements requiring PG&E action include; preparing and delivering to the CE holder an annual workplan that articulates anticipated significant actions that PG&E intends to undertake in the ensuing year, consulting with CE Holders to identify opportunities to minimize impacts to BPVs associated with the anticipated significant actions, and securing any necessary consents or approvals from the CE holder; conducting annual monitoring visits for each CE and identifying and remedying any non-conformances discovered during monitoring visits; engaging CE holders in the development of plans to implement emergent and emergency work that arises throughout the year, with a goal to identify actions to minimize impacts to BPVs; periodic review of informal uses of the watershed lands to identify and remedy potential CE nonconformances; proactively identifying and remedying potential CE nonconformances associated with unauthorized uses of the watershed lands; managing authorized uses for compliance with conservation requirements within existing agreements; and, developing systems, tools, and processes necessary to document actions, collect and trend data, and continuously improve and mature the CE compliance program.

Because specific actions resulting from compliance with the requirements of the CEs on PG&E watershed

lands will be site and circumstance specific, the actual work to be performed is unknowable at this time. However, PG&E expects the CE requirements will reasonably lead to incremental expenditures related to such things as increased volume and frequency of property inspections, installation of new or modification of existing barriers to alter or prevent unauthorized access to or uses of the watershed lands, increased volume and frequency of actions required to remedy and mitigate unauthorized dumping, modifications of access to and conduct of informal uses and, incremental evaluation and implementation, as required, of alternatives or de minimis modifications to generation or other utility operations project implementation plans resulting from consultation with CE holders.

Failure to complete this incremental compliance work in accordance with the requirements of the CEs will result in enforcement actions by CE holders in accordance with the terms and conditions of the CEs; up to and including litigation. As critically, non-compliance with the requirements of the CEs would result in defeating the purpose, spirit, and intent of the CEs and the LCC more generally.

Cost

Specific costs associated with funding requested to implement the LCC Compliance program are unknowable at this time given the potential actions and costs will be fact and circumstance specific. Estimated costs are based on reasonable expectations of activities necessary to develop and implement a CE compliance program, related systems, processes, and tools to operationalize all the PG&E CEs. Funding requirements for the program are expected to be nominal during the establishment of the program and increase over time with process maturity.

Major Project Spending Estimates
(Thousands of Nominal Dollars)

EXPENSE

Planning Order	Description	2025 Forecast	2026 Forecast	2027 Forecast	2025- '27 Total
5285612	Lands Conservation Support	300	307	650	**1,257**

Benefits

Implementation of the LCC Compliance program will enable PG&E to establish the systems, processes, and tools necessary to efficiently and effectively comply with the requirements of the CEs authorized by the Commission. As importantly, implementation of the program will allow PG&E to fulfill the spirit and intent of the LCC to permanently protect the BPVs on the watershed lands, preserving access to these amazing resources for the benefit of future generations of Californians.

Alternatives Considered

Alternative 1: Do Not Comply **-** This alternative is not recommended as it would result in non-compliance with CE requirements and the related legal and regulatory consequences of such.

Alternative 2: Absorb these costs in existing Generation authorized funding **-** This alternative is not recommended. It would require reduction in other Generation activities and investments, detracting from operational safety or reliability priorities.

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Alternative 3: Land Conservation Support – This is the recommended alternative. Implementation of the LCC Compliance program will enable PG&E to establish the systems, processes, and tools necessary to efficiently and effectively comply with the requirements of the CEs authorized by the Commission. As importantly, implementation of the program will allow PG&E to fulfill the spirit and intent of the LCC to permanently protect the BPVs on the watershed lands, preserving access to these amazing resources for the benefit of future generations of Californians.

PACIFIC GAS AND ELECTRIC COMPANY
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Project Summary

Project Title: Lower Blue Dam Seepage Mitigation

Major Work Categories: 2N
Planning Order Numbers: 5783000
Project Start Date: 2019
Project Completion Date: 2027
Operative Date (only applies to Capital): October 2026

Project Description

This project will mitigate the seepage and liquefaction concerns at Lower Blue Dam. The scope includes constructing a downstream seepage berm and buttress on the left embankment to mitigate the seepage issues as well as address seismic liquefaction hazards.

Justification

Lower Blue Lake Dam is an earth fill embankment dam and is primarily operated for seasonal storage and regulation of water for power generation downstream. In 2018, several persistent damp or moist areas were observed along the toe on the left side of the downstream embankment face during high reservoir levels. Until this project is constructed, PG&E will not install the spillway flashboards to restrict the maximum water storage elevation. This measure will limit the amount of seepage flow from areas around the toe of the dam, limiting the potential risks of piping and slope instability until this project is complete.

This project was included in the 2023 GRC with an expected completion date of 2023. During the design phase of this project, FERC notified PG&E that this project would qualify for a FERC DHAC Non-Capacity Amendment. This required additional permitting effort ultimately pushed the operative date to 2026 and the completion date to 2027. This new GRC request captures the costs for the additional permitting, increased construction scope, increased overheads, and inflation associated with moving the project out to 2026 construction.
For PG&E to meet the FERC license requirements, PG&E must operate the lake at the Maximum Water Surface Elevation (MWSE). The seepage project must be completed to mitigate the liquefaction/seepage concerns and allow flashboards to be installed allowing PG&E to raise the water level in the reservoir. Additionally, should this project be put on hold, there is a potential risk of partial dam failure in a large seismic event.

Cost

The cost assumptions for this project are based on: (a) the professional judgment of the engineers familiar with this type of work; and (b) historic PG&E cost data for similar work.

Major Project Spending Estimates
(Thousands of Nominal Dollars)

CAPITAL

Planning Order	Description	Operative Date	2024 CWIP	2025 Forecast	2026 Forecast	2027 Forecast	2028 Forecast	2029 Forecast	2030 Forecast	CWIP + 2025 - '30 Total
5783000	Lower Blue Seepage Reduction DOE	October 2026	2,177	-	4,936					**$ 7,113**

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Benefits

This project will significantly reduce the public safety and environmental impacts in the event of an uncontrolled water release as well as provide additional water storage for power generation resulting in replacement power cost savings for customers.

Alternatives Considered

Status Quo (Do Nothing) - This alternative is not recommended. This alternative does not address the public safety risks and potential damage to private and public property located near the waterways. This alternative results in less generation production as a result of the reduced water level in the reservoir and subsequent replacement power costs for customers.

Alternative 1: Install Liner - This alternative is not recommended. This alternative constructs a seepage cutoff on the upstream slope using a Carpi liner or low permeability soil blanket to prevent seepage through the embankment. After analysis, it was determined that this alternative would not be feasible due to the lack of low permeability material near the site and the potential for simply driving the seepage around the edge of the remediated area, allowing problematic seepage paths to redevelop in other areas of the dam.

Alternative 2: Install Embankment - This alternative is recommended. This alternative constructs a seepage cutoff system from the dam crest through the embankment fill and keying into the underlying foundation. This alternative will mitigate the potential for the seepage to affect the remediated area. The benefit of this alternative is reduced public safety and environmental impacts in the event of an uncontrolled water release as well as additional water storage for power generation resulting in replacement power cost savings for customers.

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Project Summary

Project Title: Lower Feeley Dam Crest Restoration

Major Work Categories: 2N **Planning Order Numbers:** 5798990 **Project Start Date:** October 2021
Project Completion Date: January 2026
Operative Date (only applies to Capital): December 2025

Project Description

The crest and upstream slope of Lower Feeley Dam have experienced erosion over time. During a California Department of Water Resources, Division of Safety of Dams (DSOD) inspection on 9/24/21, PG&E committed to restoring the dam. In this inspection it was identified that the crest and upstream slope of the dam have a noticeable low point and narrowing near the maximum section which drives the need for it to be restored. This was also confirmed in a survey of the dam in 2020, the loss of material on the crest and upstream slope was present to varying degree throughout the length of the dam.

This project proposes to restore the crest and upstream slope of the dam to meet or exceed the original design. This includes importing material to the site, as well as placement of material to achieve the dam's original design. Rock (RSP) will also be added to help prevent future erosion on the upstream slope. A cutoff wall will be placed around the Low-Level Outlet to protect and prevent damage to the actuator.

Justification

The crest and upstream face need to be restored to the designed cross section by placing new fill on the upstream slope and crest. The upstream slope also needs to be fortified to assist in preventing future erosion. PG&E has committed to DSOD that the reservoir would be restored by the end of 2025.

Cost

The cost assumptions for this project are based on professional judgment and historic PG&E cost data for similar work.

Major Project Spending Estimates
(Thousands of Nominal Dollars)

CAPITAL

Planning Order	Description	Operative Date	2024 CWIP	2025 Forecast	2026 Forecast	2027 Forecast	2028 Forecast	2029 Forecast	2030 Forecast	CWIP + 2025 - '30 Total
5798990	Lower Feely Crest Restoration Drum	December 2025	1,630	1,634						**3,265**

Benefits

Maintaining the crest of the dam will allow the dam to continue functioning as designed. Stabilization of localized degradation will greatly reduce the potential for further erosion and prolong the life and functionality of the dam allowing for safe dam operations.

Alternatives Considered

Status Quo: Do nothing – this would allow the flows to continue undercutting and plucking eventually resulting in compromises to dam integrity.

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Alternative 1: Replace dam with new rock filled dam. This alternative is not recommended due to the very high cost and the dam itself is still in good operating condition with only the crest needing to be restored.

Alternative 2: Lower Feeley Dam Crest Restoration – This is the recommended alternative. Maintaining the crest of the dam will allow the dam to continue functioning as designed. Stabilization of localized degradation will greatly reduce the potential for further erosion and prolong the life and functionality of the dam allowing for safe dam operations.

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Project Summary

Project Title: McCloud Pit Relicensing and/or License Conditions

Major Work Categories: 3H
Planning Order Numbers: 5800548, 5800553, 5800599, 5800600, 5800601, 5800602
Project Start Date: 2026
Project Completion Date: Various
Operative Date (only applies to Capital): Various; see table below

Project Description

The McCloud-Pit (McP) Project includes three powerhouses located on the McCloud and Pit Rivers in northern California. The McP powerhouses have a combined normal operating capacity of 364 MW.
The forecast cost includes the work necessary to implement the anticipated license conditions in the new license. License implementation begins when Federal Energy Regulatory Commission (FERC) issues a new License. New License implementation is expected to include: 1) physical modifications to existing dams to allow more precise control of instream flow releases; 2) recreation improvements including new and improved campgrounds, improved fishing and boating access; and 3) road improvements.

Justification

The current Project license expired in 2011, and the Project currently operates under an annually renewing license. Under the Federal Power Act (FPA), the owner of a hydropower project must obtain a license from FERC to operate its project. At the end of the license term, a licensee may apply to relicense its project. The FPA and FERC's implementing regulations specify a comprehensive process a licensee must complete to successfully renew its license. The minimum 5-year regulatory process, which often takes substantially longer, includes extensive stakeholder involvement, performance of comprehensive resource studies and balancing of complex societal and environmental issues. Failure to operate the Project in compliance with the FERC License subjects the Licensee to fines of up to $10,000 per day and loss of the License.
Licensees begin planning for activities prior to beginning the relicensing process. Relicensing begins by filing a Notice of Intent and Pre-Application Document and continues in rigorous process steps through to filing the Final License Application. Subsequent environmental review by regulating agencies must be completed before issuance of the new license by FERC. During relicensing the Licensee must remain highly engaged with stakeholders.

The schedule for issuance of a new license is uncertain and can take decades. Until the new license order has been issued, new license conditions are uncertain; however, the licensee's cost forecasts (capital and expense) are based on engagement with regulatory agencies and stakeholders throughout the relicensing proceeding, National Energy Policy Act (NEPA) and California Environmental Quality Act (CEQA) environmental reviews, regulatory processes, and intermediate steps. Cost estimates to implement new license requirements are refined iteratively throughout the relicensing process based on a growing availability of information.

The McCloud-Pit FERC 2106 new license conditions work was also forecast in the 2023 GRC. In the 2023 GRC, the expected license issuance date was January 2021. The new expected license issuance date is December 2026. Due to many layers of regulatory processes, the schedule for FERC's issuance of a New License can be uncertain and subject to authority and activities beyond the licensee's control. A licensee cannot always accurately forecast the scope and costs of license implementation because the measures that will be required are not known in advance and often take years of study of potential impacts before new

operating conditions can be specified. This is why PG&E has requested, and the Commission has approved this work be subject to balancing account treatment.

Cost

The cost assumptions for this project are based on the professional judgment of the engineers and licensing professionals familiar with this type of work and historic PG&E cost data for similar work.

The new FERC License Conditions are uncertain until the license is issued by FERC; however, the cost forecasts are based study results and discussions held with the regulatory agencies and stakeholders throughout the relicensing process, and on the Company's experience with implementing recent similar License conditions.

Major Project Spending Estimates
(Thousands of Nominal Dollars)

CAPITAL

Planning Order	Description	Operative Date	2024 CWIP	2025 Forecast	2026 Forecast	2027 Forecast	2028 Forecast	2029 Forecast	2030 Forecast	CWIP + 2025 - '30 Total
5800548	MCPIT-LC Construct Pit 7 Dam Abay Bridge	August 2032						3,462	9,563	**13,025**
5800553	MCPIT-LC Const Star City Crk Camp & DUA	August 2032						1,731	1,594	**3,325**
5800599	MCPIT-LC Recnst Tarant Gulch Boat & DUA	August 2032						2,077	1,913	**3,990**
5800600	MCPIT-LC Reconstruct Project Roads	August 2032					3,585	4,154	7,651	**15,390**
5800601	MCPIT-LC IMPL Erosion & Sediment Mgt Pln	August 2032				825	1,627	1,885	1,736	**6,073**
5800602	MCPIT-LC McCloud Dam Improve LLO	December 2029			1,307	6,811	11,414	13,311	1,308	**34,151**

Benefits

The benefits of this project include a new FERC license for James B. Black, Pit #6, Pit #7 powerhouses by 30-50 years so that PG&E can continue to operate these powerhouses to benefit customers and the general public.

Alternatives Considered

Status Quo: Do nothing - This alternative is not recommended. Under this alternative, PG&E would simply abandon the FERC licensing process that has already begun. The result of which would be PG&E's current FERC license not being renewed, and PG&E would not be able to continue operating the McCloud Pit powerhouses. If PG&E would choose to continue to operate, exorbitant fines from FERC would be incurred and potentially risking PG&E's good standing with FERC.

Alternative 1: Continue to license the McCloud-Pit Project and plan to implement the license conditions – This is the recommended alternative. Under this alternative, PG&E customers and the general public would continue to receive all the benefits of the McCloud-Pit Project.

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Project Summary

Project Title: Mokelumne Relicensing and/or License Conditions

Major Work Categories: 3H
Planning Order Numbers: 5809023
Project Start Date: 2024
Project Completion Date: 2032
Operative Date (only applies to Capital): December 2031

Project Description

The Mokelumne Project includes 4 powerhouses located on the Mokelumne and Bear Rivers in central California. The Mokelumne powerhouses have a combined normal operating capacity of 214.5 MW.

The current Project license will expire in 2031. Relicensing planning activities begin 7 years prior to current license expiration. The Relicensing process begins by filing a Notice of Intent and Pre-Application Document and continues in rigorous process steps through to filing the Final License Application. Subsequent environmental review by regulating agencies must be completed before issuance of the new license by Federal Energy Regulatory Commission (FERC). During relicensing the Licensee must remain highly engaged with stakeholders. This is a process that takes a minimum of 7 years, but in most cases continues for many more years.

Justification

Under the Federal Power Act (FPA), the owner of a hydropower project must obtain a license from FERC to operate its project. The FPA and FERC's implementing regulations specify a comprehensive and rigorous process a licensee must complete to successfully renew its license. The minimum 5-year duration collaborative process includes extensive stakeholder involvement, performance of comprehensive natural resource studies, and balancing of complex societal and environmental issues. Failure to operate the Project in compliance with the FERC License subjects the Licensee to fines of up to $10,000 per day and loss of the License.

Cost

The cost assumptions for this project are based on the professional judgment of the engineers and licensing professionals familiar with this type of work and historic PG&E cost data for similar work.

Major Project Spending Estimates
(Thousands of Nominal Dollars)

CAPITAL

Planning Order	Description	Operative Date	2024 CWIP	2025 Forecast	2026 Forecast	2027 Forecast	2028 Forecast	2029 Forecast	2030 Forecast	CWIP + 2025 - '30 Total
5809023	Mokelumne FERC-137 Relicensing	December 2031	31	679	1,077	5,098	4,654	2,311	2,554	**16,405**

Benefits

The benefits of this project include a new FERC license for Salt Springs #1 and #2, Tiger Creek, West Point, and Electra powerhouses by 30-50 years so that PG&E can continue to operate these powerhouses to benefit customers and the general public.

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Alternatives Considered

Status Quo: Do nothing - This alternative is not recommended. Under this alternative, PG&E would simply abandon the FERC licensing process that has already begun. The result of which would be PG&E's current FERC license not being renewed, and PG&E would not be able to continue operating the powerhouses of the Mokelumne Project. If PG&E would choose to continue to operate, exorbitant fines from FERC would be incurred and potentially risking PG&E's good standing with FERC.

Alternative 1: Continue to license the Mokelumne Project– This is the recommended alternative. Under this alternative, PG&E customers and the general public would continue to receive all the benefits of the Mokelumne Project.

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Project Summary

Project Title: PE ISO Meter Replacement Phase 5 Capital

Major Work Categories: 2L
Planning Order Numbers: 5771818
Project Start Date: 2012
Project Completion Date: 2027
Operative Date (only applies to Capital): December 2025

Project Description

Deregulation of California's electric utilities in the early 1990's resulted in the formation of the California Independent System Operator (CAISO). CAISO has required all generators to install revenue-quality metering systems to transmit generation data to CAISO. Defective/obsolete CAISO revenue meter(s) have been identified. The Independent System Operator (ISO) meters included in this project are outdated and have reached the end of their operating life. Replacement of meters is required to continue to provide accurate reads to the CAISO and avoid penalties. The new ISO meters will provide compliance with CAISO requirements and reduce/eliminate fines related to failure of existing ISO meter communication failures. The new meters will transfer data in real time as required and be certified in compliance with CAISO requirements. The meters have reached the end of their operating life and have started to malfunction. The meters will be replaced, tested, and commissioned for use by CAISO. This will be phase 5 of the end-of-life replacement cycle which includes 20 sites where the meters are nearing the end of their operating life. Phases 1 through 4 have completed between 8 to 12 sites for each phase.

Justification

In 2012 a program for replacement of defective/obsolete ISO meters was initiated. The program included replacement of 241 identified ISO meters that were installed and certified by CAISO around 1997-1999. Many meters have been cited by CAISO in the last few years for being unable to communicate with Remote Terminal Units (RTU's) and for being unable to transfer electric generation data for settlement calculations. The meters have reached the end of their operating life.

Cost

The cost assumptions for this project are based on professional judgment and historic PG&E cost data for similar work.

Major Project Spending Estimates
(Thousands of Nominal Dollars)

CAPITAL

Planning Order	Description	Operative Date	2024 CWIP	2025 Forecast	2026 Forecast	2027 Forecast	2028 Forecast	2029 Forecast	2030 Forecast	CWIP + 2025 - '30 Total
5771818	PE: ISO Meter Replacement Phase 5 Capital	December 2025	1,814	1,093	57					**2,964**

Benefits

Installing new ISO meters will ensure that PG&E is in regulatory compliance with CAISO in that all generators will have revenue-quality metering systems to transmit generation data to the CAISO. Reporting accurate data will ensure proper financial accounting, billing and revenue requirements.

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Alternatives Considered

Status Quo (Do Nothing) - This alternative proposes PG&E does nothing. This alternative is not preferred given that ISO meters need to transfer electric generation data for settlement calculations to stay within compliance of CAISO regulations.

Alternate 1: Replacement of identified ISO Meters - This is the preferred alternative. Installing new ISO meters will ensure that PG&E is in regulatory compliance with CAISO in that all generators will have revenue-quality metering systems to transmit generation data to the CAISO. Reporting accurate data will ensure proper financial accounting billing and revenue requirements.

PACIFIC GAS AND ELECTRIC COMPANY
Chapter 3: Hydro Operations Costs
Project Summary

Project Title: Phoenix Relicensing and/or License Conditions

Major Work Categories: IG **Planning Order Numbers:** 5283436 **Project Start Date:** 2025
Project Completion Date: 2028
Operative Date (only applies to Capital): Expense – n.a.

Project Description

Phoenix is a one-unit powerhouse located in the Southfork Stanislaus River watersheds. The Phoenix powerhouse has a normal operating capacity of 2 MW. The current Project license expired in 2022. This relicensing project is expected to result in the Company obtaining a new long-term Federal Energy Regulatory Commission (FERC) license for the Project to continue providing safe and reliable electric generation to PG&E's customers in a responsible and environmentally sensitive manner. FERC's Traditional Licensing Process is being used to obtain a new 40-year operating license. The Final Application for New License was filed with FERC on August 24, 2020. The Project is operating under annual licenses until a new license is issued by FERC consistent with completion of both federal and state-level environmental review processes.

Justification

Under the Federal Power Act (FPA), the owner of a hydropower project must obtain a license from FERC to operate its project. At the end of the license term, a licensee may apply to relicense its project. The FPA and FERC's implementing regulations specify a comprehensive and rigorous process a licensee must complete to successfully renew its license. The minimum 5-year regulatory process, which often takes substantially longer to complete, includes extensive stakeholder involvement, performance of comprehensive resource studies and balancing of complex societal and environmental issues. Licensees must be highly engaged with stakeholders and plan relicensing activities prior to the relicensing process beginning with filing of a Notice of Intent and Pre-Application Document and must continue relicensing activities through filing the License Application and subsequent environmental review processes leading to issuance of the new license by FERC. The schedule for issuance of a new license is generally uncertain and can take decades.

Cost

The cost assumptions for these projects are based on the professional judgment of the engineers and licensing professionals familiar with this type of work and historic PG&E cost data for similar work.

The new FERC License Conditions are uncertain until the license is issued by FERC; however, the cost forecasts are based on study results and discussions held with the regulatory agencies and stakeholders throughout the relicensing process, and on the Company's experience with implementing recent similar License conditions.

Major Project Spending Estimates
(Thousands of Nominal Dollars)

EXPENSE

Planning Order	Description	2025 Forecast	2026 Forecast	2027 Forecast	2025-2027 Forecast
5283436	Phoenix Relicensing- Expense LC	200	400	448	**1,048**

PACIFIC GAS AND ELECTRIC COMPANY
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Project Summary

Benefits

The benefits of this project include a new FERC license for the Phoenix powerhouse by 40 years so that PG&E can continue to operate this powerhouse to benefit customers and the general public.

Alternatives Considered

Status Quo: Do nothing - This alternative is not recommended. Under this alternative, PG&E would simply abandon the FERC licensing process that has already begun. The result of which would be PG&E's current FERC license not being renewed, and PG&E would not be able to continue operating the Phoenix Powerhouse. If PG&E would choose to continue to operate, exorbitant fines from FERC would be incurred and potentially risking PG&E's good standing with FERC.

Alternative 1: Continue to license the Phoenix Project and plan to implement the license conditions – This is the recommended alternative. Under this alternative, PG&E customers and the general public would continue to receive all the benefits of the Phoenix Project.

PACIFIC GAS AND ELECTRIC COMPANY
Chapter 3: Hydro Operations Costs
Project Summary

Project Title: Pit 1 U2 Upgrade Generator Relays

Major Work Categories: 2M **Planning Order Numbers:** 5761119 **Project Start Date:** 2017
Project Completion Date: May 2028
Operative Date (only applies to Capital): December 2027

Project Description

The Pit 1 Powerhouse generates with two vertical Francis hydro generation units with a combined capacity of 61MW. This facility is located near Fall River Mills, CA and was commissioned in 1922. The current transformers (CT) for the line side of the unit are installed around bus work in the floor of the switchgear gallery under concrete covers and are difficult to access. New CTs were installed in the generator breaker switchgear but have not been connected to protective relaying or metering. The neutral CTs are worn and in need of replacement. Existing generator protective relays are electromechanical and original to the plant. The relays are obsolete and do not meet current PG&E or North American Electric Reliability Corporation (NERC) standards for system protection. This project will install new CTs and remove the in-floor CTs as well as install new protective relays and generator protective equipment to meet PG&E and NERC standards.

Justification

The relays and generator protective equipment that are currently installed for the Pit 1 Unit 2 generator are obsolete and the protection system does not meet the current standards. This project will upgrade the system to replace worn equipment and bring the system into compliance with NERC and PG&E standards and provide better protection to the generator system.

Cost

Costs are based on construction contracts, vendor proposals, and best estimates based on similar historic project data.

Major Project Spending Estimates
(Thousands of Nominal Dollars)

CAPITAL

Planning Order	Description	Operative Date	2024 CWIP	2025 Forecast	2026 Forecast	2027 Forecast	2028 Forecast	2029 Forecast	2030 Forecast	CWIP + 2025 - '30 Total
5761119	Pit 1 U2 Upgrade Generator Relays	December 2027	1,783	-	-	2,054				**3,837**

Benefits

Replacement of the obsolete generator protective relays will bring this system up to current PG&E and NERC standards for system protection. Additionally, replacement of the current transformers (CTs) to the switchgear panel will improve accessibility, safety and reliability and the addition of stator ground protection will be used to improve unit startup conditions.

PACIFIC GAS AND ELECTRIC COMPANY
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Project Summary

Alternatives Considered

Status Quo: Do nothing – This alternative is not recommended. This alternative would leave the existing system protection equipment in its current condition. Various components of this system are either worn or outdated and not in compliance with PG&E and NERC standards.

Alternative 1: Upgrade generator relays and install new CTs **–** This is the recommended alternative. This alternative will bring this system up to current PG&E and NERC standards for system protection.

Alternative 2: Defer work by two years - This alternative is not recommended. This alternative would not be in compliance with the current PG&E and NERC standards.

PACIFIC GAS AND ELECTRIC COMPANY
Chapter 3: Hydro Operations Costs
Project Summary

Project Title: Pit 3 Lake Britton Replace Standby Generator

Major Work Categories: 2N **Planning Order Numbers:** 5792574 **Project Start Date:** November 2020
Project Completion Date: March 2029
Operative Date (only applies to Capital): December 2029

Project Description

The Pit 3 Lake Britton Dam utilizes a 100 kW 3 Phase 480 Volts Alternate Current (VAC) Propane standby generator to provide power in the event of the loss of the 12kV source. The standby generator supplies power to the blower motor starters, the valve house station service, Britton PH power station service gallery sluice gate control, Power Panel (in Pit 3 Dam Gallery), 480/280 VAC station service transformer and distribution panel battery charger for the 24 Volts Direct Current (VDC) system, and future loads of the electrical LLO actuators. The standby generator and associated propane system will be removed and replaced with a 150kW 3 Phase 480 VAC Propane standby generator and a 1,000-gallon propane tank. The existing distribution transformer will be upgraded to a 150 kVA. The gen set and tank will be relocated outside of the dam galley due to size requirements and moved across the road from the intake building on PG&E property. The current standby generator and associated propane system were installed in the early 80s. The system has reached the end of its expected life and parts are no longer available to keep it running. The scope of work includes procurement, construction and drafting of as-built drawings.

Justification

Replacement of the Pit 3 Dam Standby Generator is necessary because it has reached the end of its expected life and parts are no longer available to keep it running. The replacement will be completed before the 100-year-old hydraulic LLO actuators are replaced with electrical actuators, as the current 100kW generator cannot support running the electric actuators. The hydraulic actuators need replacement due to age and environmental risk of the addition of hydraulic fluid to the watershed.

Cost

The cost assumption for this project is based on estimates from internal resources and external vendors, along with comparable past similar project data.

Major Project Spending Estimates
(Thousands of Nominal Dollars)

CAPITAL

Planning Order	Description	Operative Date	2024 CWIP	2025 Forecast	2026 Forecast	2027 Forecast	2028 Forecast	2029 Forecast	2030 Forecast	CWIP + 2025 - '30 Total
5792574	Pit 3 Lake Britton Repl Stndby Generator	December 2029	3,231							**3,231**

Benefits

- Reduction of future O&M expense cost associated with maintaining this aging equipment.
- Eliminates the possibility of the release of hydraulic fluid into the water.
- Powerhouse reliability and employee safety benefit as the generator controls the gates which in turn controls water from the Pit River into the PH intake tunnel and affects head pressure for generation at Pit 3 PH when main power is not available from Pit 3 PH. If the penstock/tunnel to the PH is damaged, the safety mechanism is for the intake gates to close, but without power, they would be unable to close.

PACIFIC GAS AND ELECTRIC COMPANY
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Alternatives Considered

Status Quo: Do nothing – This alternative is not recommended. This alternative may lead to an uncontrolled release of water if power is lost to the dam potentially resulting in a violation of FERC License requirements and public safety and property risks downstream. This alternative results in future O&M expense cost increases associated with maintaining this aging equipment. This alternative does not eliminate the possibility of the release of hydraulic fluid into the water. If failure occurred the timeline for repair could be significant and leave the dam and powerhouse inoperable in the event of PSPS or other power outages. This could lead to replacement power costs to customers.

Alternative 1: Replace Standby Generator – This is the recommended alternative. This alternative would remove the existing generator and replace with a new generator resulting in the benefits listed above.

Alternative 2: Defer Replacement for two years – This alternative is not recommended. This alternative will defer the replacement of the standby generator by two years and increase the risk of equipment failure and long lead times for repairs. This alternative ultimately has the same long-term benefits as the recommended alternative; however, in the short-term, this alternative is not recommended for the risks discussed in Status Quo alternative.

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Project Summary

Project Title: Pit 3 Lifecycle Replacement

Major Work Categories: 2M
Planning Order Numbers: 5762324, 5799218
Project Start Date: 5762324 - 2022, 5799218 – 2021
Project Completion Date: 5762324 - 2029, 5799218 - 2026
Operative Date (only applies to Capital): 5762324 – Dec. 2029, 5799218 – Oct. 2026

Project Description

The Pit 3 Powerhouse, commissioned in 1925, has three vertical Francis turbine units with a total normal operating capacity of 69.9 Megawatts (MW). Pit 3 also provides water storage for Pit 4, Pit 5, Pit 6 and Pit 7.

The projects include the replacement of the generator step-up (GSU) transformer Unit 2 runner, wicket gates and seal rings.
One main bank GSU transformer supports all three generating units at Pit 3. Replacing the step-up transformer is also included in the scope of the project. The GSU transformer has reached its end of life and was recommended for replacement in 2012. In 2023 repairs were made when it was discovered the insulation between the windings was falling out. The lead time to procure a new transformer is 2-3 years.

Justification

Many of the equipment and systems at the Pit 3 Powerhouse are original and are approaching or have exceeded their design life. The GSU transformer and Unit 2 turbine have been in service since 1925. There are no spare transformers available in PG&E's fleet to support all three generating units if the transformer failed before a replacement could be procured.

Welding repairs were made to the runner in 2018 following an inspection of the Unit 2 turbine performed by Pacific Gas and Electric (PG&E's) Applied Technology Services (ATS) Non-Destructive Examination (NDE) group. The inspection revealed cracks and cavitation damage on the turbine's numerous blades. Blade thinning was also noted in the report, which is difficult to weld repair. Blade thinning reduces material strength. Consequently, cracking is likely to become more regular and would require more frequent outages to address repairs. The Unit 2 turbine is almost 100 years old and has exceeded its useful life.

Cost

The cost assumptions for this project are based on the professional judgment of the engineers familiar with this type of work, historic PG&E cost data for similar work and secured proposal cost from vendors, constructors, and industry professionals along with estimated installation overheads.

Major Project Spending Estimates
(Thousands of Nominal Dollars)

CAPITAL

Planning Order	Description	Operative Date	2024 CWIP	2025 Forecast	2026 Forecast	2027 Forecast	2028 Forecast	2029 Forecast	2030 Forecast	CWIP + 2025 - '30 Total
5762324	Pit 3 PH U2 Upgrade Runner Wicket Gates & Seal Rings	December 2029	1,462	-	168	5,970	3,561	3,113	106	**14,380**
5799218	Pit 3 Replace GSU Transformer	October 2026	4,011	-	451					**4,462**

PACIFIC GAS AND ELECTRIC COMPANY
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Benefits

- Potential avoidance of future O&M expense cost increases associated with maintaining this aging equipment.
- Potential avoidance of higher capital costs for equipment/system replacement on an expedited basis if any of the major equipment or systems fails.
- A higher level of power generation reliability resulting from a reduction in forced outages caused by this aging equipment. This results in replacement power cost savings for customers.

Alternatives Considered

Status Quo: Do Nothing - This alternative is not recommended. The alternative assumes that no action is taken other than minimal maintenance until an unplanned failure. This alternative results in a potential of future O&M expense cost increases associated with maintaining this aging equipment. Also, a very long forced outage would occur until new components could be fabricated and installed resulting in additional costs for expedited work and replacement power costs for customers.

Alternative 1: Replace/Refurbish – This is the recommended alternative. This alternative results in a potential avoidance of future O&M expense cost increases associated with maintaining this aging equipment; the potential avoidance of higher capital costs for equipment/system replacement on an expedited basis if any of the major equipment or systems fail; and a higher level of power generation reliability resulting from a reduction in forced outages caused by aging equipment. This results in replacement power cost savings for customers.

Alternative 2: Reschedule One Year – This alternative is not recommended. This alternative assumes the projects are rescheduled for one year. This alternative ultimately has the same long-term benefits as the recommended alternative; however, in the short-term, this alternative is not recommended for the same reasons discussed in the status quo.

PACIFIC GAS AND ELECTRIC COMPANY
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Project Summary

Project Title: Pit 3 Powerhouse (PH) Seismic Retrofit

Major Work Categories: 2L **Planning Order Numbers:** 5742783 **Project Start Date:** 2012
Project Completion Date: 2026
Operative Date (only applies to Capital): December 2025

Project Description

Improve the level of safety for the Pit 3 Powerhouse building occupants in the event of an earthquake by installing a seismic retrofit system comprising of internal structural steel beams, columns, and cross bracing at select locations within the powerhouse.

Justification

Pit 3 PH is a 70-megawatt PG&E hydroelectric facility. The PH serves as the switching center for the entire Manton watershed and all operations for Pit 1, Pit 3, Pit 4, Hat 1 and Hat 2. The PH is staffed 24 hours a day, 365 days a year (24/7) by personnel who monitor and control PG&E's power generation assets and coordinate resources and responses for facilities within its jurisdiction. Pit 3 PH was designed and constructed circa 1924 before any seismic standards were established. According to the United States Geologic Survey (USGS), the site is located within a seismically active area.

A seismic evaluation utilizing the current American Society of Civil Engineers (ASCE) Seismic Evaluation and Retrofit of Existing Buildings (ASCE-41) performed in 2021 found that severe seismic deficiencies exist in the PH. The PH is expected to collapse during a significant seismic event leading to loss of life.

The planned retrofit is intended to meet minimum life safety and collapse prevention performance objectives per ASCE 41. The added structural reinforcements are intended to allow occupants to survive a seismic event and exit the building safely post seismic event. The retrofits are focused on preventing collapse of the overall building and protecting the 24/7 occupied space which is the 3rd floor of the switch house.
Background Information: In 2003 DeSimone Consulting Engineers of San Francisco performed a structural analysis of the existing building using FEMA 356 Pre-Standard and Commentary for the Seismic Rehabilitation of Buildings published in November 2000. An ETABS computer model of the structure was created to check the structural adequacy for seismic loads. DeSimone summarized its findings in a report to PG&E on February 14, 2003, which noted that the building, both globally and with respect to individual members, was adequate for seismic loads except for the concrete roof slab. The report recommended adding structural ties at the ridge between the two halves of the concrete roof diaphragm to mitigate the structural deficiency caused by the opening.

In July of 2012, an Alternative Analysis Study was submitted by Black and Veatch (BV) to evaluate alternatives for bridging the roof diaphragm at the ridge vent opening and addressing mechanical ventilation issues associated with blocking the ridge vent opening. An amendment to the study was submitted to PG&E in January of 2013. Recommendations from these two studies were not implemented by PG&E.

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In 2012 and 2013 an alternative analysis and recommended design solution was completed based on DeSimone Consulting Engineer's study, including upgrade of the ventilation system. The Federal Emergency Management Agency (FEMA) 356 standard has since become obsolete and has been upgraded twice.

In 2016 PACE Engineering of Redding performed a structural analysis of the existing building using ASCE 41-13 Seismic Evaluation and Retrofit of Existing Buildings. In using ASCE 41, the analysis was intended to evaluate the powerhouse using more modern seismic performance standards. An ETABS computer model of the structure was created to check structural adequacy for seismic loads using a linear dynamic analysis procedure. PACE summarized its findings in a report to PG&E on February 19, 2016, which noted that shear wall elements, diaphragm chords and collectors, and foundation elements were not adequate for seismic loads. The report recommended extensive retrofits throughout the building.
In 2020 PG&E's project engineers performed a cursory comparison of the assumptions utilized for the 2003 and 2016 seismic evaluations. Give the variability in assumptions and recommendations between the two prior studies, PG&E decided to embark on a final seismic effort for the project which included engineering comparison of previous studies and assumptions, field testing and a new seismic study. An alternatives analysis based on the results of the new seismic study included variations of structural reinforcement to achieve the performance objective. A value engineering effort with a full non-linear analysis was also performed at 50% design to confirm the new retrofit system was meeting the design intent. This effort resulted in a significant reduction of scope.

Cost
The cost assumptions for this project are based on: (a) Third party constructability estimate solicited during the design phase; and (b) Contractor support in a preconstruction phase to develop the following deliverables: field verifications (where accessible), constructability review and cost and schedule estimates.

Major Project Spending Estimates
(Thousands of Nominal Dollars)

CAPITAL

Planning Order	Description	Operative Date	2024 CWIP	2025 Forecast	2026 Forecast	2027 Forecast	2028 Forecast	2029 Forecast	2030 Forecast	CWIP + 2025 - '30 Total
5742783	Pit 3 PH Seismic Retrofit	December 2025	13,061	9,216						**22,277**

Benefits
The retrofit will mitigate identified seismic deficiencies in the Pit 3 PH and achieve target seismic performance level for increased employee safety. This project will also result in a higher level of power generation reliability resulting from the avoidance of a long-forced outage caused by a seismic event. This results in a replacement power cost savings for customers.

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Project Summary

Alternatives Considered

Status Quo: Do nothing – This alternative is not recommended as it does not mitigate the identified seismic deficiencies in the Pit 3 PH that could result in loss of life and loss of generation.

Alternative 1: Pit 3 PH Seismic Retrofit – This is the recommended alternative. The retrofit will mitigate identified seismic deficiencies in the Pit 3 PH and achieve target seismic performance level for increased employee safety and replacement power cost savings for customers.

Alternative 2: Delay Alternative 1 project by one year – This alternative is not recommended since it realizes the long- term benefit of Alternative 1 but not the short-term risks associated with the status quo alternative.

PACIFIC GAS AND ELECTRIC COMPANY
Chapter 3: Hydro Operations Costs
Project Summary

Project Title: Pit 3 Repave Road

Major Work Categories: 2P
Planning Order Numbers: 5792584 **Project Start Date:** 2022
Project Completion Date: 2027
Operative Date (only applies to Capital): 2026

Project Description

The Pit 3 Repave Road project covers the Pit 3 Reach of the Pit River Canyon Road, which runs from Clark Creek Road in NE Shasta County to the Pit 3 Powerhouse. The Pit 3 Reach has roughly six miles of single lane paved road.

The proposed scope of work is to design, permit and construct several subsurface structural repairs and install additional drainage improvements as well as finish the road with a new paved and striped surface. The repaving effort will include the following construction process:

- Excavate and install Mechanically Stabilized Earth (MSE) walls in designated areas.
- Excavate degraded subsurface material and replace with competent subsurface aggregates.
- Excavate and install drainage improvements in designated areas.
- Pulverize existing asphalt, reshape and compact pulverized materials to design elevations.
- Repave entire road alignment from Clark Creek Road to Pit 3 Powerhouse.

Justification

The “Road and Transportation Facility Management Plan” (RMP) for the Pit 3, 4, and 5 Hydroelectric Project stipulates an evaluation of the Pit 3 Road (NFSR 37N06) by an engineer once every six years. Additionally, PG&E is responsible for maintaining the roadway under the FERC license agreement. The United States Forest Service (USFS) requires that the Pit 3 Road be “maintained with a stable, hardened and uniform road surface for vehicular traffic, as well as other requirements presented in assigned maintenance level and Traffic Service Levels (TSL).

The existing road surface has been in a substandard condition for the last 15 years while being mitigated with asphalt patching. Most recently the road has been trenched for undergrounding of high voltage power lines which has left the road in an unsatisfactory condition for long term use. Finally, the road is the only access to Pit 3 Powerhouse where the switching center is located for operating the watershed hydroelectric facilities on a 24/7 basis.

Cost

Cost estimates were developed with an “early contractor engagement process” in which an entrusted contract partner developed unit cost estimates with a preliminary drawing set. While estimates are expected to increase, those increases for scope refinement, unplanned and unknowns are covered with risk and contingency escalations within the estimate. Cost forecasts were made using an approved cost estimate which includes industry professional expertise from a civil contractor who will perform the construction. Cost was also considered against completed road work in other areas of the system that where “like and kind.”

PACIFIC GAS AND ELECTRIC COMPANY
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Project Summary

Major Project Spending Estimates
(Thousands of Nominal Dollars)

CAPITAL

Planning Order	Description	Operative Date	2024 CWIP	2025 Forecast	2026 Forecast	2027 Forecast	2028 Forecast	2029 Forecast	2030 Forecast	CWIP + 2025 - '30 Total
5792584	Pit 3 Repave Road	October 2026	650	-	4,203	95				**4,948**

Benefits

Potential avoidance of future O&M expense cost increases associated with maintaining this deteriorating asset. Restore vehicular access to facilities cut off by severe weather. Reduce hazards associated with driving. Ensure continued safe access of generation assets and compliance with FERC Licenses.

This road is the only access to the Pit 3 Switching Center, a 24/7 operation to run the upper Pit River Hydroelectric System. The Pit 3 Switching Center also provides back up control to the lower Pit River Hydroelectric System. Representing approximately 10% of the state's base load demand.

Alternatives Considered

Status Quo (Do Nothing) - This alternative is not recommended given that the age of the roads and the difficulty in safely accessing various PG&E power generation assets. Under this alternative, where ownership is maintained by the USFS, PG&E will not comply with this agency's requirements that roads be maintained to the assigned maintenance level of the applicable roadway management plans. For PG&E maintained roads outside the FERC boundary, the roads would deteriorate to appoint that continued access to remote facilities would not be possible and PG&E would be in violation of its FERC Licenses.

Alternative 1: Repair existing assets - This alternative proposes PG&E does repairs. This alternative is not preferred given that O&M expense cost increases associated with maintaining this aging equipment. This alternative may also jeopardize PG&E's ability to comply with FERC Licenses.

Alternative 2: Replacement with in-kind structures - This alternative will be used for roads that have reached their end of life and need to be replaced. This is cost savings to the customer as standard designs and materials are readily available. This alternative avoids future O&M expense cost increases associated with maintaining this deteriorating asset. This alternative also ensures PG&E is in compliance with its FERC Licenses.

PACIFIC GAS AND ELECTRIC COMPANY
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Project Summary

Project Title: Pit 3 Tailrace Bridge Refurbish Pier Voids

Major Work Categories: 2P **Planning Order Numbers:** 5798499 **Project Start Date:** June 2022
Project Completion Date: December 2028
Operative Date (only applies to Capital): October 2027

Project Description

In 2019, a diving contractor for PG&E's Pit 3 Powerhouse Concrete and Cladding Repair Project, reported additional grout pumping due to encountering voids in some of the concrete piers at the tailrace area while installing the cladding and repairing the tailrace floor. The finding mandates additional investigation to understand the extent of void inclusion in the concrete piers which support the concrete bridge above. PG&E plans to retain the services of a contractor who specializes in underwater ultrasound scanning of concrete structures to better understand the voids in the concrete piers. Additionally, plans include the possibility of dewatering the tailrace to perform the scanning and pumping of grout into the piers concurrently.

Justification

The Pit 3 Tailrace Bridge is in the road alignment and part of the right of way with the USFS Road 37N06. The integrity of the bridge piers is essential to public and employee safety. Further, the bridge is connected to the powerhouse and could damage the powerhouse structure if a failure occurred. Seismic concerns are also a consideration as it relates to the pier voids compromising the pier strength in a seismic event.

Cost

The cost assumptions for this project are based on professional judgment and historic PG&E cost data for similar work.

Major Project Spending Estimates
(Thousands of Nominal Dollars)

CAPITAL

Planning Order	Description	Operative Date	2024 CWIP	2025 Forecast	2026 Forecast	2027 Forecast	2028 Forecast	2029 Forecast	2030 Forecast	CWIP + 2025 - '30 Total
5798499	Pit 3 Tailrace Bridge Refurbish Pier Voids	October 2027	15	-	39	7,191	92			**7,336**

Benefits

Completion of this work will ensure the bridge is safe for PG&E and the general public. Further, it ensures access to downstream facilities at Pit 4 Dam, Pit 4 Powerhouse and Pit 5 Diversion Dam.

Alternatives Considered

Status Quo: Do Nothing – This alternative is not recommended. This alternative does not ensure that the bridge is safe for PG&E personnel and the general public.

Alternative 1: Pit 3 Tailrace Bridge Refurbish Pier Voids – This is the recommended alternative. Completion of this work will ensure that the bridge is safe for PG&E and the general public. Further, it ensures access to downstream facilities at Pit 4 Dam, Pit 4 Powerhouse and Pit 5 Diversion Dam.

Alternative 2: Replace the entire bridge – This alternative is not recommended. This alternative results in the same benefits as Alternative 1, but the cost of this alternative is much higher than the cost of Alternative 1.

PACIFIC GAS AND ELECTRIC COMPANY
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Project Summary

Project Title: Pit 4 Dam Replace Steel Footbridge

Major Work Categories: 2N **Planning Order Numbers:** 5798500 **Project Start Date:** 2023
Project Completion Date: April 2027
Operative Date (only applies to Capital): October 2026

Project Description

Visual inspection of the Pit 4 dam footbridge reveals that the existing protective coating (paint) on the steel trusses is deteriorating and no longer providing effective protection against corrosion activities. The intent of this project is to extend the life of the Pit 4 dam footbridge by recoating the steel members and halting the corrosion process and minimizing potential for structural damage. This project will be renamed as "Pit 4 Dam Recoat Steel Footbridge."

Justification

PG&E considered alternatives to address the observed corrosion on the steel trestle members and originally elected to move forward with full replacement of the bridge. However, PG&E has further considered the potential alternatives and the current condition of the bridge and does not believe full replacement of the bridge is necessary at this time. An assessment of the condition of the bridge was performed in 2022 where an ultrasonic thickness gauge was used to determine whether appreciable loss of structural section of the members due to corrosion had occurred. In general, no noticeable loss of material was observed on the steel members which indicates good structural integrity of the bridge. Therefore, PG&E considers recoating of the bridge to be an effective and practical means of addressing the condition of the bridge

Cost

Third party constructability estimate, and project team estimate based on similar scopes of work.

Major Project Spending Estimates
(Thousands of Nominal Dollars)

CAPITAL

Planning Order	Description	Operative Date	2024 CWIP	2025 Forecast	2026 Forecast	2027 Forecast	2028 Forecast	2029 Forecast	2030 Forecast	CWIP + 2025 - '30 Total
5798500	Pit 4 Dam Replace Steel Footbridge	October 2026	353	305	3,592					**4,250**

Benefits

Recoating the steel members of the footbridge will create a protective barrier that prevents rust and structural damage and allows PG&E to continue to safely use of the footbridge to continue to operate and maintain the Pit 4 dam assets.

Alternatives Considered

Status Quo: Do nothing – This alternative is not recommended. Loss of coating allows for the steel members of the bridge to rust and corrode, resulting in loss of materials jeopardizing the structural integrity of the bridge.

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Alternative 1: Recoat the footbridge – This is the recommended alternative. Remove existing coating of the entire steel bridge and recoat for corrosion protection. This will extend the life of the asset in the most cost-effective manner. The bridge provides access to the dam allergy where manual operation of the drum gates, sumps and low-level outlet (in the event of a loss of power) is performed. Access to the equipment is considered critical to the operation of the dam.

Alternative 2: Retrofit and recoat the footbridge – This alternative is not recommended. This alternative is the same as alternative 1 but it would also reinforce select steel members to increase live load capacity and withstand an earthquake in the Maximum Design Earthquake (MDE) level. This alternative was not selected based on the intended use of the structure not necessitating the retrofit at this time. Also, this alternative is more costly than alternative 1.

Alternative 3: Replace the footbridge – This alternative is not recommended. This alternative would remove the existing bridge and replace it with a low-profile steel stringer bridge capable of increased live loads and MDE earthquake levels. This alternative was not economically favorable when compared to recoating which meets the minimum intent for addressing the issue.

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Project Summary

Project Title: Pit 4 PH Install Stop Log Gate Hoists

Major Work Categories: 2L **Planning Order Numbers:** 5804258 **Project Start Date:** 2028
Project Completion Date: 2030
Operative Date (only applies to Capital): December 2029

Project Description

The Pit 4 Powerhouse has six stop log gates that are raised and lowered as needed to seal out river water from the tailrace for inspections and maintenance work. The existing tailrace gates are raised and lowered into position with a single deck-mounted hoist using a multi-position rigging system. This system was installed when the powerhouse was constructed in 1955. The existing hoist system is aged and difficult for operation and maintenance (O&M) personnel to operate. The rigging system is too heavy to carry by hand and must be dragged across the deck. A harnessed worker is lowered down to the gate over turbulent tailrace water to attach the rigging to a gate or unpin the gates from their stored position. The rigging process is laborious and complex and requires operator training for safe and proper operation.

Justification

The O&M maintenance crew has identified safety concerns with ergonomics, rigging issues, and potential personnel safety concerns while operating the hoist system to lift and lower the gates. PG&E has replaced similar legacy hoists systems at other powerhouses that allow for safer operation. The Pit 6 & Pit 7 Powerhouses had similar systems replaced with an electric powered, deck mounted gate hoist system for each gate. Thus far the new system has proven to be a safer and more ergonomic system in comparison to what was previously in place.

Cost

The cost assumptions for this project are based on professional judgement and historical PG&E cost data for similar work.

Major Project Spending Estimates
(Thousands of Nominal Dollars)

CAPITAL

Planning Order	Description	Operative Date	2024 CWIP	2025 Forecast	2026 Forecast	2027 Forecast	2028 Forecast	2029 Forecast	2030 Forecast	CWIP + 2025 - '30 Total
5804258	Pit 4 PH Install Stop Log Gate Hoists	December 2029	8	-	-	-	873	2,104	144	**3,130**

Benefits

- Potential avoidance of future O&M expense cost increases associated with maintaining this aging equipment.
- Improved personnel safety as gates can be opened and closed remotely during storm events rather than personnel needing to operate each gate during an outage.

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Alternatives Considered

Status Quo: (Do Nothing) - This alternative is not recommended given that the age and difficulty of procuring replacement parts for the existing gates. This alternative results in an increase in future O&M expense costs associated with maintaining this aging equipment. It also does not address the current safety risks of operating this aging equipment.

Alternative 1: Installation of a new stop log gate hoist lift system – This is the recommended alternative. This alternative avoids future O&M expense cost increases associated with maintaining this aging equipment. This alternative also addresses personnel safety as gates can be opened and closed remotely rather than personnel needing to operate each gate during an outage.

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Project Title: Pit 4 PH Unit 1 Upgrade Runner Wicket Gates & Seal Rings
Major Work Categories: 2M
Planning Order Numbers: 5720696
Start Date: 2028
Project Completion Date: August 2032
Operative Date (only applies to Capital): December 2030

Project Description

Pit 4 includes 2-units located in the upper reaches of the Pit River. Pit 4 Powerhouse (PH) was constructed in 1955 and generates electricity using two vertical Francis-type turbines. The Pit 4 powerhouse produces an average of about 505 GWh of electricity per year and provide 95 MW of dependable capacity to help meet our customers' summertime demand for electricity.

The scope of work is to replace the Pit 4 Powerhouse Unit 1 runner, wicket gates, facing plates, and other appurtenances.

Justification

The Pit 4 Powerhouse Unit 1 has experienced problems with rough run zone operation unless air injection/intake is used at low loads to remediate. The air injection/intake is also used for load shaping/ peaking operation and voltage support. Due to the age, wear, difficult operating requirements, and need for excessive maintenance it is recommended that the runner, wicket gates, facing plates and other appurtenances be replaced to allow for safe reliable operation of the unit.

Cost

Historical data and professional knowledge were used to establish the cost assumptions below.

Major Project Spending Estimates
(Thousands of Nominal Dollars)

CAPITAL

Planning Order	Description	Operative Date	2024 CWIP	2025 Forecast	2026 Forecast	2027 Forecast	2028 Forecast	2029 Forecast	2030 Forecast	CWIP + 2025 - '30 Total
5720696	Pit 4 PH Unit 1 Upgrade Runner Wicket Gates & Seal Rings	December 2030					229	580	2,062	**2,872**

Benefits

- Potential avoidance of future O&M expense cost increases associated with maintaining this aging equipment.
- Potential avoidance of higher capital costs for equipment/system replacement on an expedited basis if any of the major equipment or systems fails.
- A higher level of power generation reliability resulting from a reduction in forced outages caused by this aging equipment. This results in replacement power cost savings for customers.

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Alternatives Considered

Status Quo: Do Nothing **-** This alternative is not recommended. This alternative assumes that no action is taken other than minimal maintenance until an unplanned failure. This alternative results in a potential of future O&M expense cost increases associated with maintaining this aging equipment. Also, a very long forced outage would occur until new components could be fabricated and installed resulting in additional costs for expedited work and replacement power costs for customers.

Alternative 1: Replace the Pit 4 Powerhouse Unit 1 runner, wicket gates, facing plates, and other appurtenances – This is the recommended alternative. This alternative results in a potential avoidance of future O&M expense cost increases associated with maintaining this aging equipment; the potential avoidance of higher capital costs for equipment/system replacement on an expedited basis if any of the major equipment or systems fail; and a higher level of power generation reliability resulting from a reduction in forced outages caused by aging equipment. This results in replacement power cost savings for customers.

Alternative 2: Reschedule One Year – This alternative is not recommended. This alternative assumes the project is rescheduled for one year. This alternative ultimately has the same long-term benefits as the recommended alternative; however, in the short-term, this alternative is not recommended for the same reasons discussed in the status quo.

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Project Summary

Project Title: Pit 4 Powerhouse (PH) Upgrade Crane

Major Work Categories: 2P **Planning Order Numbers:** 5792458 **Project Start Date:** 2022
Project Completion Date: 2027
Operative Date (only applies to Capital): December 2027

Project Description

The cranes at the Pit 4 PH were manufactured in the early 1950s and are original equipment. The cranes support annual powerhouse maintenance inspections as well as other planned powerhouse improvements. The powerhouse cranes operating controls are experiencing problems due to age. This planned upgrade includes replacing the trolley, bridge drive, bridge idler wheel assemblies, new Variable Frequency Drives (VFD), load weighing system, and radio controls.

Justification

An assessment of the cranes by a third-party engineering firm identified numerous crane deficiencies and a list of upgrades recommended due to the age of the cranes and the inability to obtain repair/replacement parts. The crane assessment found the crane switch systems, as well as other parts are obsolete and should be replaced to ensure continued reliable service.

Cost

The forecast is based on similar projects completed in the watershed.

Major Project Spending Estimates
(Thousands of Nominal Dollars)

CAPITAL

Planning Order	Description	Operative Date	2024 CWIP	2025 Forecast	2026 Forecast	2027 Forecast	2028 Forecast	2029 Forecast	2030 Forecast	CWIP + 2025 - '30 Total
5792458	Pit 4 PH Upgrade Crane(s)	December 2027	95	-	2,525	5,285				**7,905**

Benefits

- Potential avoidance of future O&M expense cost increases associated with maintaining this aging equipment.
- A higher level of power generation reliability resulting from a reduction in forced outages caused by this aging equipment. This results in replacement power cost savings for customers.
- Increased productivity for crane-dependent projects.
- By incorporating modern control systems and mechanical upgrades, the project ensures compliance with current safety standards while extending the crane's lifespan.

Alternatives Considered

Status Quo: Do nothing – This alternative is not recommended. Attempting to maintain the existing crane will result in future O&M expense cost increases associated with maintaining this aging equipment; an increase in forced outages resulting in replacement power costs to customers; safety risks; and no improvement in productivity for crane-dependent projects.

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Alternative 1: Replacement- This alternative is not recommended. While replacing the crane has the same benefits as the proposed project, it is less cost-effective due to the higher capital costs.

Alternative 2: Refurbishment- This alternative is the recommended solution as it realizes all the above benefits at the lowest capital cost.

Alternative 3: Repair- This alternative is not recommended. This alternative is essentially the same as the status quo alternative.

Alternative 4: Retirement- This alternative is not recommended. The crane is required to continue to maintain the powerhouse. This alternative would lead to the shutdown of the powerhouse because PG&E would no longer be able to maintain it. This alternative would not be in the best interests of the customer.

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Project Summary

Project Title: Pit 4 Replace Generator Air Breakers

Major Work Categories: 2M **Planning Order Numbers:** 5766152 **Project Start Date:** 2016
Project Completion Date: 2026
Operative Date (only applies to Capital): December 2025

Project Description

Pit 4 includes 2-units located in the upper reaches of the Pit River. The Pit 4 powerhouse produces an average of about 505 GWh of electricity per year and provide 95 MW of dependable capacity to help meet our customers' summertime demand for electricity.
Pit 4 powerhouse (PH) was constructed in 1955 and generates electricity using two vertical Francis-type turbines. The fault protection equipment between the turbine generators and the 13.8/230kV generator step-up transformers currently includes the original two Westinghouse 13.8kV air blast circuit breakers. The equipment is near the end of its useful life, is obsolete, and it is difficult to locate spare/replacement parts.

The Pit 4 Generator Air Breakers are fully integrated into a single switchgear cabinet and include the following: two air blast circuit breakers, two sets of 6 switches (one for each breaker), and one set of 3 phase disconnect switches (connection to the main transformer). Since the switchgear contains all the equipment, it is incredibly difficult to piecemeal out the replacement of each individual equipment.

Justification

The generator air breakers are original equipment (1955) and have exceeded the recommended design life of forty years. Repairs were made in 2011, 2014 and 2017 by Operations and Maintenance (O&M) due to significant decrease in air pressure after operation. The equipment is considered obsolete as replacement parts and repairs are subject to reseller availability or parts have had to be custom ordered to make repairs. The generator breakers are functional at this time, but if the generator air breakers were to fail in service, depending on repair/replacement part availability, the PH could be subject to a forced outage for up 30 days. Additionally, an arc flash study from 2006 identified the 13.8kV bus as a source of arc flash with incident energy higher than 8cal/cm2. Current mitigation for this condition includes operational requirements such as remaining at minimum of four feet away from the equipment when it is in service and no maintenance on the equipment unless the bus is de-energized, or operator is at a remote location. A new 13.8kV switchgear line-up will limit the arc flash exposure in the event of an arcing fault to 8cal/cm2 (or less) per PG&E standards and remove the operating restriction around the equipment. Based on historical statistics (provided by the Centre for Energy Advancement through Technological Innovation (CEATI)), the air blast circuit breakers failure risk has a likely probability of failure within ten years. The air breakers are fully integrated into a single switchgear cabinet that includes the two air breakers, two sets of six switches (one for each breaker) and one set of disconnect switches (connection to main transformer). A new switchgear line-up will replace the entire switchgear cabinet and associated equipment.

Cost

Cost estimates are from estimate to construct from contractor and internal General Construction based on final design.

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Major Project Spending Estimates
(Thousands of Nominal Dollars)

CAPITAL

Planning Order	Description	Operative Date	2024 CWIP	2025 Forecast	2026 Forecast	2027 Forecast	2028 Forecast	2029 Forecast	2030 Forecast	CWIP + 2025 - '30 Total
5766152	Pit 4 Replace Generator Air Breakers	December 2025	5,105	5,806						**10,911**

Benefits

- A higher level of personnel safety.
- Potential avoidance of future O&M expense cost increases associated with maintaining this aging equipment.
- Potential avoidance of higher capital costs for breakers and/or 13.8kV equipment on an expedited basis if a failure occurs.
- A higher level of power generation reliability resulting from a reduction in forced outages caused by this aging equipment. This results in a replacement power cost savings for customers.

Alternatives Considered

Status Quo: Do nothing – This alternative is not recommended. If PG&E operates both generators until a breaker/system failure, the result could be an injury to an employee. Also, this alternative results in higher capital costs for breakers and/or 13.8kV equipment on an expedited basis if a failure occurs. This alternative also results in a higher level of forced outages caused by this aging equipment resulting in replacement power costs for customers.

Alternative 1: Replace Generator Breakers and 13.8kV Equipment – This is the recommended alternative. This alternative results in a higher level of personnel safety. It avoids future O&M expense cost increases associated with maintaining this aging equipment and avoids higher capital costs for breakers and/or 13.8kV equipment on an expedited basis if a failure occurs. Finally, this alternative results in a higher level of power generation reliability resulting from a reduction in forced outages caused by this aging equipment. This results in a replacement power cost savings for customers.

Alternative 2: Refurbish Existing Generator Breakers and Other 13.8kV Equipment – This alternative is not recommended. The existing generator breakers are near the end of their useful lives and are no longer supported by vendors. Also, replacement parts are no longer readily available.

Alternative 3: Retire the Generator Air Breakers at Pit 4 – This alternative is not recommended. This alternative would remove the air breakers from service without replacing. This is not a viable option as the breakers are the connecting point between the generator step-up (GSU) transformer and the generator and is a critical piece of the generator protection. This alternative would result in the removal of Pit 4 from service resulting in excessive replacement power costs for customers.

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Project Summary

Project Title: Pit 4 U1 Rewind Generator Stator

Major Work Categories: 2M **Planning Order Numbers:** 5720747 **Project Start Date:** January 2027
Project Completion Date: August 2031
Operative Date (only applies to Capital): December 2030

Project Description

The proposed scope of work is to rewind the Pit 4 Powerhouse Unit 1 generator and perform other prudent generator modifications (e.g. protective relay system upgrade, generator and turbine bearing temperature monitoring systems, vibration monitoring system and partial discharge sensing systems).

Justification

The Pit 4 Powerhouse Unit 1 generator winding is nearly 40 years old and has reached the end of its service life. PG&E's Generator Assessment program has identified that the Pit 4 Unit 1 generator (57.5 MVA) has a health score of 4.5, which translates to a potential for failure within 4 years. This generator was last rewound in 1986 by West/EA and partial discharge analysis (PDA) test of this generator is trending upward, it is recommended that the generator be rewound prior to failure.

Cost

Historical data and professional knowledge were used to establish the cost assumptions below.

Major Project Spending Estimates
(Thousands of Nominal Dollars)

CAPITAL

Planning Order	Description	Operative Date	2024 CWIP	2025 Forecast	2026 Forecast	2027 Forecast	2028 Forecast	2029 Forecast	2030 Forecast	CWIP + 2025 - '30 Total
5720747	Pit 4 U1 Rewind Generator Stator	December 2030				143	1,376	5,721	5,389	**12,629**

Benefits

- Potential avoidance of higher capital costs for a rewind on an expedited basis if the generator windings fail.
- A higher level of power generation reliability resulting from a reduction in forced outages caused by this aging equipment. This results in replacement power cost savings for customers.

Alternatives Considered

Status Quo: Do Nothing - This alternative is not recommended. This alternative would run the generator to failure. This alternative would result in higher capital costs for a rewind on an expedited basis after the generator windings fail. This alternative would also result in a higher level of power generation forced outages caused by this aging equipment. This results in replacement power costs for customers.

Alternative 1: Rewind Generator - This is the recommended alternative. This alternative results in the avoidance of higher capital costs for a rewind on an expedited basis if the generator windings fail. This alternative also results in a higher level of power generation reliability resulting from a reduction in forced outages caused by this aging equipment. This results in replacement power cost savings for customers.

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Alternative 2: Retire - This alternative is not recommended. This alternative would run the generator until it fails and then retire the asset. Since the generator is needed for Pit 4 Unit 1 to generate power, this alternative would result in excessive replacement power costs for customers.

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Project Summary

Project Title: Pit 5 Dam Refurbish Left Wing Wall

Major Work Categories: 2N **Planning Order Numbers:** 5797779 **Project Start Date:** March 2022
Project Completion Date: January 2027
Operative Date (only applies to Capital): October 2026

Project Description

The Pit 5 Diversion Dam is a 340-foot-long concrete gravity structure located in Shasta County, California along the Pit River. The dam is classified as "High Hazard Potential" according to the California Division of Safety of Dams (DSOD) but "Low Hazard Potential" according to the Federal Energy Regulatory Commission (FERC). The Pit 5 Diversion Dam includes steeply inclined concrete wing walls located downstream of the dam along the left and right riverbanks (looking downstream). During a DSOD inspection completed on March 25, 2020, previously undocumented cracks forming in the concrete of the left erosion control slab (south bank) structure were observed, as well as an approximate 10-foot by 11-foot segment of concrete missing from the top downstream corner of the slab. The ongoing erosion is a concern for its potential impacts to the left-wing wall, low-level outlet, and, if it were to extend upstream, the dam itself.

Current scope includes:

- Preparation of the project site/laydown areas including vegetation removal.
- Installation of turbidity curtain in Pit River downstream of the Pit 5 dam.
- Construction of a temporary access road to the top of the eroded hillside, including benching the upper most section.
- Major excavation from the bench in a top-down approach.
- Installation of rock slope protection (RSP) at the toe of the slope downstream of the erosion control slab.
- Hauling and permanent placement, including compaction of excavation materials, at an off-site spoils area.

The plan has been reviewed by the State Water Board and will require a full California Environmental Quality Act (CEQA) evaluation.

Justification

Current condition of the left-wing wall is deteriorated and eroded, presenting a hazard to the low-level outlet. Commitments have been made to agencies regarding the remediation of the wing wall along with the additional slope protection that is to be added downstream of the wing wall to prevent further undermining and erosion of the wing wall from occurring. This project will ensure compliance with both FERC and DSOD by providing a long-term repair solution.

Cost

Costs for this project were developed in coordination with PG&E's General Construction division based on production, work schedule, material costs and historical PG&E cost data for similar work.

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Major Project Spending Estimates
(Thousands of Nominal Dollars)

CAPITAL

Planning Order	Description	Operative Date	2024 CWIP	2025 Forecast	2026 Forecast	2027 Forecast	2028 Forecast	2029 Forecast	2030 Forecast	CWIP + 2025 - '30 Total
5797779	Pit 5 Dam Refurbish Left Wing Wall	October 2026	773	305	4,112	24				**5,213**

Benefits:

- This project will mitigate further undermining and destabilization of the left erosion control slab and the toe of the steep slope, which provides stability to protect the dam low-level outlet and apron.
- Potential avoidance of future O&M expense cost increases associated with mitigating further undermining and destabilization of the left erosion control slab and the toe of the steep slope.
- Potential avoidance of higher capital costs for potential damages to the left-wing wall, the low-level outlet and the structural integrity of the dam.
- A higher level of power generation reliability resulting from a reduction in forced outages caused by structural damage to the dam. This results in replacement power cost savings for customers.

Alternatives Considered

Status Quo – Do Nothing – This alternative is not recommended. If nothing is done, the erosion and existing voids will continue to deteriorate and increase dam structural concerns potentially resulting in a partial or full dam failure with an uncontrolled water release that would impact native wildlife, private, recreational and federal property. This alternative would also be not fulfilling a commitment to DSOD to resolve the undercutting.

Alternative 1: *Rock Slope Protection (RSP) RSP placed from bench cut (Recommended).* This is the recommended alternative as it allows RSP to be placed precisely, can be constructed without the use of a cofferdam, and reduces dam safety issues of a partial or complete failure of the dam with an uncontrolled water release causing majors damages to native wildlife, private, recreational and federal property. This alternative will also comply with a DSOD recommendation and stop further deterioration.

Alternative 2: Defer Slope Protection One Year. This alternative is not recommended. Delaying this work will result in further deterioration increasing the risk of a partial or complete failure of the dam with an uncontrolled water release causing majors damages to native wildlife, private, recreational and federal property.

Alternative 3: Gabion, buttress fill using stacked gabion gravity retaining wall. This alternative is not recommended due to environmental concerns as access for setting gabion baskets would require crossing the river and wire mesh may negatively impact fish habitat resulting in fines from both the State and Federal environmental agencies.

Alternative 4: Gabion, mattresses installed directly on existing slope. This alternative is not recommended due to slope stability concerns due to no buttress provided in this alternative. Also due to environmental concerns as access for setting gabion baskets would require crossing the river and wire mesh may negatively impact fish habitat resulting in fines from both the State and Federal environmental agencies.

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Project Summary

Project Title: Pit 5 Penstock Geotechnical Hardening

Major Work Categories: 2L **Planning Order Numbers:** 5811968 **Project Start Date:** TBD
Project Completion Date: December 2029
Operative Date (only applies to Capital): March 2029

Project Description

The Pit 5 Penstock System is among the highest risk assets in the Penstock Program Inventory driven by the systems geohazard evaluations. This project will evaluate and execute risk reduction measures to the penstock that either reduce the consequences of failure by increasing detection and response time and/or reduce the likelihood of failure through constructing mitigation measures.

Justification

This project reduces the risk of water conveyance system failure.

Cost

Historical data and professional knowledge were used to establish the cost assumptions below.

Major Project Spending Estimates
(Thousands of Nominal Dollars)

CAPITAL

Planning Order	Description	Operative Date	2024 CWIP	2025 Forecast	2026 Forecast	2027 Forecast	2028 Forecast	2029 Forecast	2030 Forecast	CWIP + 2025 - '30 Total
5811968	Pit 5 Penstock Geotechnical Hardening	March 2029					138	3,121		**3,258**

Benefits

Reduction in the consequences of penstock failure and/or a reduction in the likelihood of a penstock failure resulting in the following:

- Reduction in employee and environmental safety risks.
- Potential avoidance of higher capital costs for equipment replacement on an expedited basis.
- A higher level of power generation reliability resulting in replacement power cost savings for customers.

Alternatives Considered

Status Quo: Do Nothing – This alternative is not recommended. This alternative does not address the employee and environmental safety risks; higher capital costs for equipment replacement on an expedited basis; or the replacement power cost savings opportunity for customers associated with a penstock failure.

Alternative 1: Pit 5 Penstock Geotechnical Harding – This is the recommended alternative. This alternative results in the reduction in employee and environmental safety risks; a potential avoidance of higher capital costs for equipment replacement on an expedited basis; and a higher level of power generation reliability resulting in replacement power cost savings for customers.

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Project Summary

Project Title: Pit 5 Surge Chamber and Valve House Slide Stabilization

Major Work Categories: 2P **Planning Order Numbers:** 5797658 **Project Start Date:** 2021
Project Completion Date: 2026
Operative Date (only applies to Capital): December 2025

Project Description

The purpose of this project is to provide long term slope stabilization to address a landslide that occurred adjacent and upslope of the Pit 5 valve house in the 2012 and 2016/2017 storm seasons.

The work is comprised of the following:

- Grading the landslide slope to remove landslide materials.
- Stabilizing resultant over-steepened cut slopes to create a bench for future slope access.
- Constructing and/or replacing drainage improvements; and
- Permanently placing and grading excavated spoils at select spoil disposal locations.

Justification

The first landslide occurred when the area received an excessive amount of rainfall between November 15 and December 5, 2012. This caused a shallow debris-flow landslide to form which impacted the side of the valve house and downslope penstock pipe. Neither of these structures were damaged although some scour was observed on the downstream edge of a concrete slab and access stairs at the valve house. The landslide material was removed, and erosion control measures were placed in the landslide scar in late 2013. In addition, the scoured area at the slab was filled to create a cement stacked “wall” and swale to protect the slope from further erosion and provide a path for water to flow. Upon completion, holes were drilled through the slab and the area under the slab was filled with a cement grout.

The landslide was reactivated during the 2016/2017 winter season when the project area received over 120 inches of rain. Short-term winterization repairs of the area were completed in Fall 2017 including placement of keyed-in rock slope protection and installation of HDPE (High-Density Polyethylene) sheeting (pond liner).

A subsurface investigation was performed in 2019 and included reconnaissance-level geologic mapping of the landslide area, the drilling of one exploratory boring completed as an inclinometer with attached vibrating-wire piezometer, the excavation of four test pits, and laboratory testing of select samples. The landslide has been monitored since the installation of instrumentation was installed in 2019. The data collected to date suggests a landslide depth of 15 feet.

Based on the data collected and an analysis of alternatives, a design was selected to mitigate the landslide by excavating and grading the slope to remove landslide prone materials, stabilizing resultant over-steepened cut slopes using soil nails and shotcrete/Tecco-Mesh walls and rock-slope protection (RSP), and permanently placing and grading the excavated material in select spoil disposal locations.

Cost

The cost assumptions for this project are based on: (a) Opinion of Probable Construction Cost (OPCC) provided by the design engineer and (b) Rough order of magnitude (ROM) estimate from PG&E general construction team.

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Major Project Spending Estimates
(Thousands of Nominal Dollars)

CAPITAL

Planning Order	Description	Operative Date	2024 CWIP	2025 Forecast	2026 Forecast	2027 Forecast	2028 Forecast	2029 Forecast	2030 Forecast	CWIP + 2025 - '30 Total
5797658	Pit 5 Surge Chmbr & VH Sld Stabilization	December 2025	894	4,126						**5,020**

Benefits

Potential avoidance of future O&M expense cost increases associated with maintaining this deteriorating asset. Restore vehicular access to facilities cut off by severe weather. Reduce hazards associated with driving. Ensure continued safe access of generation assets and compliance with FERC Licenses.

Alternatives Considered

Status Quo: Do nothing - Status Quo (Do Nothing) - This alternative is not recommended given that the age of the roads and the difficulty in safely accessing various PG&E power generation assets. For PG&E must maintain roads in the FERC boundary, the roads would deteriorate to appoint that continued access to remote facilities would not be possible and PG&E would be in violation of its FERC Licenses.

Alternative 1: Construction of a flexible shallow landslide barrier – This alternative is not recommended. The flexible shallow barrier consists of high-tensile, flexible steel wire netting supported by steel posts on the existing slope bench adjacent the valve house. The steel posts are connected to reinforced-concrete footings. This alternative was not selected as it does not reduce the chance of future landslide events by removing the existing slide material, has the potential to overtop in a large event and requires ongoing maintenance costs.

Alternative 2: Construction of a bin wall barrier structure – This alternative is not recommended. A bin wall consisting of galvanized steel closed faced bins filled with native or imported fill would be constructed on the existing bench adjacent the valve house. Due to slope geometric constraints and constructability limits of the bin wall this option was not selected *native 3: Slope Grading* – This is the recommended alternative. This alternative includes addressing the intermediate depth landslide concerns by grading the slope to remove the slide prone materials and to construct surface drainage elements on intermediate benches. Addressing the complex slope geometry included options to cut and fill and cut and remove the slide material. This alternative (cut and remove) is the selected alternative as it addresses the intermediate landslide depth of approximately 15 feet and provides the opportunity to implement additional mitigation measures in the future should data collected from the site suggest a deeper-seated landslide is present.

Alternative 4: Slope grading with the addition of deep stitch pier walls – This alternative is an extension of Alternative 3 (cut and remove) and includes additional repair elements to address deeper-seated landslide concerns. The additional elements include deep stitch pier walls. This alternative would be harder and longer to construct and is determined to not be necessary at this time based on data collected from the site.

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Project Summary

Project Title: Pit 5 U1 Replace Excitation System

Major Work Categories: 2M **Planning Order Numbers:** 5762320 **Project Start Date:** 2017
Project Completion Date: 2026
Operative Date (only applies to Capital): October 2026

Project Description

The existing direct connect excitation system for Pit 5 Unit 1 will be upgraded to a new modern full-static excitation system with a new power potential transformer (PPT), automatic voltage regulator, solid state controller, and brushes. The existing slip rings will be reused. All other equipment will be removed from service including the spare exciter, abandoned exciter rheostats, and analog controllers. This new full-static system will be a pilot for replacement of the other 3 units at Pit 5.

Justification

Pit 5 is a four-unit powerhouse on the Pit River constructed in 1943. The existing excitation system consists of DC commutator exciters and analog controllers. The DC commutator exciters are original to the plant and the excitation controllers were installed in the 1980s. These systems are obsolete and not as responsive as modern static excitation systems. In addition, carbon buildup in the DC commutator exciters is causing maintenance problems and forced outages. In addition to the brush issues the existing field breakers are malfunctioning and are no longer reliable.

Cost

The cost assumptions for this project are based on: (a) the professional judgement of the engineers familiar with this type of work; and (b) rough order of magnitude estimate from the equipment manufacturer and PG&E's General Construction team.

Major Project Spending Estimates
(Thousands of Nominal Dollars)

CAPITAL

Planning Order	Description	Operative Date	2024 CWIP	2025 Forecast	2026 Forecast	2027 Forecast	2028 Forecast	2029 Forecast	2030 Forecast	CWIP + 2025 - '30 Total
5762320	Pit 5 U1 Replace Excitation System	October 2026	1,733	820	1,073					**3,626**

Benefits

- Potential avoidance of higher capital costs for an excitation system on an expedited basis if the current excitation system has an in-service failure.
- Potential avoidance of future O&M expense cost increases associated with maintaining this aging equipment.
- A higher level of power generation reliability resulting from a reduction in forced outages caused by this aging equipment. This results in replacement power cost savings for customers.

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Project Summary

Alternatives Considered

Status Quo: Do nothing - This option was not selected as the current system is beyond its useful life. An in-service failure would result in an extended forced outage that would result in higher capital costs for an excitation system on an expedited basis and replacement power costs for customers. This alternative also results in future O&M expense cost increases associated with maintaining this aging equipment. Carbon dust produced by the DC commutators and slip rings brushes leaves a carbon dust layer on the units and contaminates the generator windings causing excessive maintenance and on occasion unplanned shutdowns.

Alternative 1: Replace in Like Kind - This alternative is not recommended. This alternative has the same benefits as the recommended alternative except it doesn't address the maintenance and reliability issues caused by the carbon dust.

Alternative 2: Replace Existing System with a Thyristor Brushless Exciter – This is the recommended alternative. This alternative avoids future O&M expense cost increases associated with maintaining this aging equipment and results in a higher level of power generation reliability resulting in replacement power cost savings for customers. Additional benefits are fast response, high performance, and a smaller footprint.

PACIFIC GAS AND ELECTRIC COMPANY
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Project Summary

Project Title: Pit 6 PH U1 Repl CT, PT, SA, & Bus Duct
Major Work Categories: 2M **Planning Order Numbers:** 5803278 **Project Start Date:** 2027
Project Completion Date: 2031
Operative Date (only applies to Capital): June 2030

Project Description

The Pit 6 Powerhouse includes 2 units and is located in the upper reaches of the Pit River. The Pit 6 powerhouse produces an average of about 374 GWh of electricity per year and provides 80 MW of dependable capacity to help meet our customers' summertime demand for electricity.

The scope of this project will be to remove and replace the Pit 6 Unit 1 current transformer (CT), potential transformer (PT), surge arrestor (SA), and bus duct.

Justification

The Pit 6 Powerhouse Unit 1 CT generator and neutral have been in service since 1965 are near end of life. The current configuration is difficult for PG&E to perform testing. The PTs and SA are also near end of life and asset management and local engineering recommend replacement. The bus duct will be inspected by a third-party contractor, and it is expected that it will be required to be replaced.

Cost

Historical data and professional knowledge were used to establish the cost assumptions below.

Major Project Spending Estimates
(Thousands of Nominal Dollars)

CAPITAL

Planning Order	Description	Operative Date	2024 CWIP	2025 Forecast	2026 Forecast	2027 Forecast	2028 Forecast	2029 Forecast	2030 Forecast	CWIP + 2025 - '30 Total
5803278	Pit 6 PH U1 Repl CT, PT, SA ,& Bus Duct	June 2030				122	309	2,421	2,290	**5,142**

Benefits

- Potential avoidance of higher capital costs for replacement of this equipment on an expedited basis if this equipment fails in service.
- A higher level of power generation reliability resulting from a reduction in forced outages caused by this aging equipment. This results in replacement power cost savings for customers.

Alternatives Considered

Status Quo: Do Nothing – This alterative is not recommended. This alternative would run the PH until this equipment fails. This alternative results in higher capital costs for replacement of this equipment on an expedited basis when this equipment fails in service. This alternative also results in excessive replacement power costs for customers.

Alternative 1: Refurbish the equipment - This alternative is not recommended. This alternative would refurbish affected parts only as they failed. The existing parts are at the end of their service life. It would be most efficient to replace all components at the same time. Refurbishing individually as they failed would mean

taking unplanned outages with loss of generation resulting in replacement power costs for customers.

Alternative 2: Replace CT, PT, SA & Bus Duct - This is the recommended alternative. This alternative will avoid higher capital costs for replacement of this equipment on an expedited basis if this equipment fails in service. It will also result in a higher level of power generation reliability resulting from a reduction in forced outages caused by this aging equipment. This results in replacement power cost savings for customers.

Alternative 3: Retire – This alternative is not recommended. This alternative would run the equipment to failure and then retire the equipment. Since this equipment is vital to the operation of Pit 6 PH U1, retirement of this equipment results in the inability to operate Pit 6 PH U1. This results in excessive replacement power costs for customers.

PACIFIC GAS AND ELECTRIC COMPANY
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Project Summary

Project Title: Pit 6 Units 1 and 2 Upgrade Turbine

Major Work Categories: 2M
Planning Order Numbers: 5720719 (Unit 1), 5720720 (Unit 2)
Project Start Date: 2025
Project Completion Date: 2030
Operative Date (only applies to Capital): December 2030

Project Description

The Pit 6 Project includes 2-units located in the upper reaches of the Pit River. The Pit 6 powerhouse produces an average of about 374 GWh of electricity per year and provides 80 MW of dependable capacity to help meet our customers' summertime demand for electricity.

Pit 6 has two Francis turbine units. The project includes replacing the runners, wicket gates, facing plate, and overhauling the linkage and servo. Additional work will be completed as applicable on the operating ring, headcover, bottom ring and turbine shaft once inspections can be performed by a qualified engineer as well as any competent testing.

Justification

The justification for this project is reliability. The timing of a possible failure is a function of current runner condition. The existing runners have worn out due to the mineral content of the water, cavitation and erosion damage due to cyclic loading, and loss of original design blade profiles. The runners have undergone significant welding repairs over the years to mitigate the areas of cavitation, weld porosity, and material voids. The runners are approaching the end of life and the lead time for materials is long.

Cost

The cost assumptions for this project are based on the professional judgement of the engineers familiar with this type of work

Major Project Spending Estimates
(Thousands of Nominal Dollars)

CAPITAL

Planning Order	Description	Operative Date	2024 CWIP	2025 Forecast	2026 Forecast	2027 Forecast	2028 Forecast	2029 Forecast	2030 Forecast	CWIP + 2025 - '30 Total
5720719	Pit 6 PH U1 Upgrade Turbine	December 2030	122	-	-	659	564	4,388	7,781	**13,514**
5720720	Pit 6 PH U2 Upgrade Turbine	December 2030	126	-	179	3,793	564	4,388	7,781	**16,832**

Benefits

- Upgrading the turbine systems at the Pit 6 powerhouse will bolster power production, reduce maintenance requirements, and enhance reliability. Resulting long-term accomplishments would include increased efficiency and cost effectiveness.
- Potential avoidance of future O&M expense cost increases associated with maintaining this aging equipment including welding repairs.
- Potential avoidance of higher capital costs for equipment/system replacement on an expedited basis if any of the major equipment or systems fails.

- A higher level of power generation reliability resulting from a reduction in forced outages caused by this aging equipment. This results in replacement power cost savings for customers.

Alternatives Considered

Status Quo: Do Nothing - This alternative assumes that no action is taken other than minimal maintenance until unplanned runner failure. A very long forced outage would occur until new components could be fabricated and installed resulting in additional costs for expedited work and replacement power.

Alternative 1: Replace/Refurbish – This is the recommended alternative. This alternative results in a potential avoidance of future O&M expense cost increases associated with maintaining this aging equipment; the potential avoidance of higher capital costs for equipment/system replacement on an expedited basis if any of the major equipment or systems fail; and a higher level of power generation reliability resulting from a reduction in forced outages caused by aging equipment. This results in replacement power cost savings for customers.

Alternative 2: Reschedule One Year –This alternative is not recommended. This alternative assumes the projects are rescheduled for one year. This alternative ultimately has the same long-term benefits as the recommended alternative; however, in the short-term, this alternative is not recommended for the same reasons discussed in the status quo.

PACIFIC GAS AND ELECTRIC COMPANY
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Project Summary

Project Title: Pit 7 U1 Replace Runner

Major Work Categories: 2M **Planning Order Numbers:** 5720716 **Project Start Date:** January 2027
Project Completion Date: February 2032
Operative Date (only applies to Capital): December 2030

Project Description

The Pit 7 Project includes 2-units located in the upper reaches of the Pit River. The Pit 7 powerhouse produces an average of about 374 GWh of electricity per year and provides 80 MW of dependable capacity to help meet our customers' summertime demand for electricity.

The runner replacement is based on asset age; condition; past repair failure rates; and consequences of component failure. Failure of the turbine runner has the potential to cause an imbalance condition that could result in catastrophic failure and significant damage to the shaft, bearing and generating components.

Justification

The justification for this project is reliability. The timing of a possible failure is a function of current runner condition. The existing runner has worn out due to the mineral content of the water. The runner has undergone significant welding repairs over the years to mitigate the areas of cavitation, weld porosity, material voids and is approaching the end of its life. This type of failure would result in lost generation; inability to meet water delivery obligations; and a substantial outage duration to perform repairs or complete overhaul of both generating and turbine systems.

Cost

Historical data and professional knowledge were used to establish the cost assumptions below.

Major Project Spending Estimates
(Thousands of Nominal Dollars)

CAPITAL

Planning Order	Description	Operative Date	2024 CWIP	2025 Forecast	2026 Forecast	2027 Forecast	2028 Forecast	2029 Forecast	2030 Forecast	CWIP + 2025 - '30 Total
5720716	Pit 7 U1 Replace Runner	December 2030				143	275	1,248	7,685	**9,351**

Benefits

- Potential avoidance of future O&M expense cost increases associated with maintaining this aging equipment.
- Potential avoidance of higher capital costs for equipment/system replacement on an expedited basis if any of the major equipment or systems fails.
- A higher level of power generation reliability resulting from a reduction in forced outages caused by this aging equipment. This results in replacement power cost savings for customers.

PACIFIC GAS AND ELECTRIC COMPANY
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Project Summary

Alternatives Considered

Status Quo: Do Nothing - This alternative is not recommended. This alternative assumes that no action is taken other than minimal maintenance until unplanned runner failure. A very long forced outage would occur until new components could be fabricated and installed resulting in additional costs for expedited work and replacement power.

Alternative 1: Replace Runner - This is the recommended alternative. This alternative will remove and replace the existing runner. This alternative results in a potential avoidance of future O&M expense cost increases associated with maintaining this aging equipment; the potential avoidance of higher capital costs for equipment/system replacement on an expedited basis if any of the major equipment or systems fail; and a higher level of power generation reliability resulting from a reduction in forced outages caused by aging equipment. This results in replacement power cost savings for customers.

Alternative 2: Defer Replacement One Year - This alternative is not recommended. This alternative assumes the project is rescheduled for one year. This alternative ultimately has the same long-term benefits as the recommended alternative; however, in the short-term, this alternative is not recommended for the same reasons discussed in the status quo.

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Project Summary

Project Title: Pit 7 PH Units 1 & 2 Replace CT, SA, PT & Bus Duct

Major Work Categories: 2M
Planning Order Numbers: 5803280 (Unit 1), 5803281 (Unit 2)
Project Start Date: 5803280 – 2023, 5803281 – 2024
Project Completion Date: 5803280 – 2028, 5803281 – 2029
Operative Date (only applies to Capital): 5803280 – October 2028, 5803281 – October 2029

Project Description

The Pit 7 Powerhouse (PH) is a 112_MW facility located on the Pit River in Shasta County, CA. The Pit 7 PH high voltage transformers and buses have been in service since 1965. These projects propose to remove and replace the existing current transformers generator and neutral, surge arrestors, potential transformers, and bus ducts at both Pit 7 PH Units 1 & 2.

Justification

The associated current transformers generator and neutral, potential transformers, surge arrestors, and bus ducts are near the end of their useful life and will be replaced. These components have been in service since 1965 and are at the end of their useful life. Replacement of the bank is necessary to reduce risk of failure. In the event of a failure of any of these components would cause an extended forced outage at Pit 7 PH resulting in replacement power costs for customers.

Cost

The cost assumptions for this project are based on professional judgment of the local engineering and hydro team familiar with this type of work.

Major Project Spending Estimates
(Thousands of Nominal Dollars)

CAPITAL

Planning Order	Description	Operative Date	2024 CWIP	2025 Forecast	2026 Forecast	2027 Forecast	2028 Forecast	2029 Forecast	2030 Forecast	CWIP + 2025 - '30 Total
5803280	Pit 7 PH U1 Replace CT, SA, & Bus Duct	October 2028	458	-	26	774	1,676			**2,934**
5803281	Pit 7 PH U2 Replace CT, SA, & Bus Duct	October 2029	65	-	-	492	945	1,789		**3,290**

Benefits

- Potential avoidance of future O&M expense cost increases associated with maintaining this aging equipment.
- Potential avoidance of higher capital costs for equipment/system replacement on an expedited basis if any of the major equipment or systems fails.
- A higher level of power generation reliability resulting from a reduction in forced outages caused by this aging equipment. This results in replacement power cost savings for customers.

PACIFIC GAS AND ELECTRIC COMPANY
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Project Summary

Alternatives Considered

Status Quo: Do Nothing - This alternative is not recommended. Running these units until one of these components fails would put the units into a forced outage. This forced outage would last until new components could be procured and installed resulting in additional costs for expedited work and excessive customer replacement power costs.

Alternative 1: Refurbish – This alternative is not recommended for the same reasons as the status quo alternative. This alternative would refurbish affected parts only as they failed.

Alternative 2: Replace CT, PT, SA & Bus Duct - This is the recommended alternative. This alternative results in the avoidance of future O&M expense cost increases associated with maintaining this aging equipment and a higher level of power generation reliability resulting from a reduction in forced outages caused by this aging equipment. This results in replacement power cost savings for customers.

Alternative 3: Reschedule One Year – This alternative is not recommended. This alternative assumes the projects are rescheduled for one year. This alternative ultimately has the same long-term benefits as the recommended alternative; however, in the short-term, this alternative is not recommended for the same reasons discussed in the status quo.

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Project Summary

Project Title: Poe Dam Install Ped Bridge & Survey Plat

Major Work Categories: 2L **Planning Order Numbers:** 5788250 **Project Start Date:** March 2020
Project Completion Date: September 2025
Operative Date (only applies to Capital): December 2025

Project Description

During the refurbishment of Poe Dams flood gates, pedestrian bridges were temporarily installed along Poe Dam to support construction activities. The bridges provide OSHA compliant access along the dam piers and removed the need to go up and down 60ft ladders in support of the project. Installing these bridges in a permanent configuration will provide a safer and more efficient means of access to perform inspection and maintenance activities. In addition, Corrective Action Program (CAP) notification number 113725409 – Poe Settlement Survey, was submitted by PG&E surveyors requesting that a catwalk be installed at the lower level to reduce physical demand and safety risks when performing settlement surveys. Also included in the CAP item was a request to expand an area at survey pin G, which is near the bridge at left abutment near state route highway 70. Upcoming work at the dam's toe in 2027 will require this project's bridges.

Justification

The proposed pedestrian bridge installation reduces fall potential and improves worker safety by increasing access to the five radial flood gates and piers. Historically, flood gate chain maintenance has been impacted by the difficulties in getting safely to a point to access the chain at the pier level with the necessary equipment. This new level pathway with the piers will provide compliant, safe access to each pier and support easier access to the survey monument on the other side near the railroad. The additional platform area around the survey monument near Hwy 70 minimizes the risk of a fall down the adjacent slope. This supports PG&E's goal of risk reduction.

Cost

The cost assumptions for this project are based on the professional judgment of the project manager familiar with this type of work. Costs are based on rough order of magnitude and AACE class 3 estimates. Costs are subject to change pending completion of formal engineering design, long lead materials purchase, and construction costs.

Major Project Spending Estimates
(Thousands of Nominal Dollars)

CAPITAL

Planning Order	Description	Operative Date	2024 CWIP	2025 Forecast	2026 Forecast	2027 Forecast	2028 Forecast	2029 Forecast	2030 Forecast	CWIP + 2025 - '30 Total
5788250	Poe Dam Install Ped Bridge & Survey Plat	December 2025	1,411	1,971						**3,382**

PACIFIC GAS AND ELECTRIC COMPANY
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Project Summary

Benefits

The bridge installation reduces fall potential and improves worker safety. By increasing access to the five radial flood gates and piers, PG&E will avoid future O&M expense cost increases associated with alternate means of accessing that location for monthly inspections (such as with a helicopter). Historically, flood gate chain inspection and maintenance has been impacted by the difficulties in getting safely to a point to access the chain at the pier level with the necessary line of site or testing equipment.

Alternatives Considered

Status Quo: Do Nothing – This alternative is not recommended. This alternative is not consistent with the Company's effort to improve worker safety and reduces fall potential at PG&E facilities.

Alternative 1: Install bridge sections to the furthest platform on the piers downstream – This alternative is not recommended due to the timing and cost of the permitting involved in drilling pier footings near dam abutments.

Alternative 2: Install elevated column platform on the lower pier deck downstream such that it is flush with the upper pier deck and allows the bridge segments to connect – This is the recommended alternative. This alternative meets the safety improvement needs at the lowest cost.

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Project Summary

Project Title: Poe Dam Replace Gate Chains & LS

Major Work Categories: 2N **Planning Order Numbers:** 5779463 **Project Start Date:** April 2019
Project Completion Date: January 2027
Operative Date (only applies to Capital): October 2026

Project Description

Poe Dam is located in Butte County, CA on the North Fork of the Feather River. The dam was constructed in 1959 and includes 4 radial gates that are each 50-ft wide by 41-ft tall. Each gate is lifted using a pair of alloy steel roller chains, located at either side of the gate, and are operated by a fixed overhead electric hoist system. Each chain is constructed of two longer “dogleg” links that connect directly to a lug on the gate. The "dogleg" links are attached to 74 common links that are driven by a sprocket on the hoist. Pacific Gas and Electric Company (PG&E) Operations and Maintenance staff have routinely noted that some common links in the chains remain “kinked” during operation causing performance issues such as uneven chain loading, rubbing between the gates and pier walls, and gate leaks. During a 2017 visual inspection of Gate 4, it was noted that 8 to 10 feet of chain just above the “dogleg” connecting links, in the area routinely submerged in water, were more corroded, and some “kinks” and “frozen” links were observed. In addition, in 1998, the Gate 3 hoist system experienced a failure that has been attributed to “frozen” links breaking free and causing a shock load on the system. These issues have led PG&E to pursue replacement of the existing lifting chains. Continued chain deterioration may lead to operational difficulties in seating the gate upon the spillway resulting in a potential gate failure within the spillway resulting in uncontrolled water releases. The hoist chains need to be replaced to continue with safe and reliable operation of the gates.

Justification

This work will reduce operational difficulties in seating the gate upon the spillway and a potential gate control failure within the spillway resulting in uncontrolled water releases. The hoist chains and limit switches need to be replaced to continue with safe and reliable operation of the flood gates at Poe Dam. There would be a forced outage at Poe PH due to a failure of one of the gate chains during gate travel. A gate failure would cause water to bypass the powerhouse and flow down the spillway instead of through the intake tower to the unit. This project will address a Facility Safety recommendation to replace the Poe Dam lifting chains for Gates 1, 2, 3 and 4 for continued safe and reliable operation of the dam. Additionally, the project will add shaft encoder limit switches to improve the gate position readings provided by the current radial arm inclinometers.

Cost

The cost assumptions for this project are based on the professional judgment of the project manager familiar with this type of work. Costs are based on rough order of magnitude and AACE class 3 estimates. Costs are subject to change pending completion of formal engineering design, long lead materials purchase, and construction costs.

Major Project Spending Estimates
(Thousands of Nominal Dollars)

CAPITAL

Planning Order	Description	Operative Date	2024 CWIP	2025 Forecast	2026 Forecast	2027 Forecast	2028 Forecast	2029 Forecast	2030 Forecast	CWIP + 2025 - '30 Total
5779463	Poe Dam Replace Gate Chains & LS DOE	October 2026	2,458	4,494	3,065					**10,017**

PACIFIC GAS AND ELECTRIC COMPANY
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Project Summary

Benefits

- Provide reliable remote visibility to gate positions eliminating the need for in person gate position readings increasing the productivity of daily operations while the dam is spilling. If proper gate position is not maintained during spill conditions, then over topping of the dam could lead to erosion on the down steam surface of the dam causing structural instability that may lead to a dam failure.
- Avoids a gate control failure within the spillway that could result in an uncontrolled water release that would have environmental and safety risks.
- Potential avoidance of future O&M expense cost increases associated with maintaining this aging equipment.
- A higher level of power generation reliability resulting from a reduction in forced outages caused by this aging equipment. This results in a replacement power cost savings for customers.

Alternatives Considered

Status Quo: Do nothing – This alternative is not recommended. This alternative does not address the issue with the safety risk potential for a forced outage due to a failure of one of the gate chains during gate travel. A gate failure would cause water to bypass the powerhouse and flow down the spillway instead of through the intake tower to the unit. The possibility of this event has occurred in the past on Gate #3 in 1998. The remaining chains are 20 additional years past the useful life of Gate #3. The cost of a forced outage due to one of the other gates failing would be significant.

Alternative 1: Replace in Two Phases – This is the recommended alternative. This alternative will replace gates 1, 2, and 4 chains in kind for better service reliability to mitigate the potential for a similar type of gate failure event that happened to Gate number 3 in 1998. This alternative results in the avoidance of a gate control failure within the spillway that could result in an uncontrolled water release that would have environmental and safety risks; the potential avoidance of future O&M expense cost increases associated with maintaining this aging equipment; and a higher level of power generation reliability resulting from a reduction in forced outages caused by this aging equipment. This results in a replacement power cost savings for customers.

Alternative 2: Defer by 1 Year – This alternative is not recommended. This alternative assumes the project is rescheduled by one year. This alternative ultimately has the same long-term benefits as the recommended alternative; however, in the short-term, this alternative is not recommended for the same reasons discussed in status quo.

PACIFIC GAS AND ELECTRIC COMPANY
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Project Summary

Project Title: Poe Dam Toe Voids Install Cutoff Wall

Major Work Categories: 2N **Planning Order Number:** 5800005 **Project Start Date:** 2022
Project Completion Date: April 2028
Operative Date (only applies to Capital): April 2027

Project Description

The Poe Diversion Dam, completed in 1958, is a part of the Poe Hydroelectric Project. Poe Dam is located on the North Fork of the Feather River just North of the Community of Pulga, in Butte County, and about two miles downstream from Crest Powerhouse.

The project involves two phases, completed over two separate construction seasons. The first phase is the development of an access road to allow equipment and vehicular access to the riverbed downstream of the dam. The second phase is the installation of the cutoff wall and repairs to the existing concrete apron.

The temporary access road work planned for 2026 includes vegetation clearing, grading, slope stabilization on the downstream side of the road, and placement of aggregate base on the road surface.
The cutoff wall installation planned for 2027 includes installation of a cofferdam on the upstream side of the dam, and a flow bypass, to divert water around the work area. Pumps will be utilized to manage nuisance water in the work area. The downstream end of the existing apron will then be excavated to sound rock, or a depth below the potential erosion zone, and a concrete cutoff wall installed. Surface repairs will also be made to the existing apron and the site returned to service.

Justification

PG&E conducted dive inspections of the downstream toe of the dam as part of the Division of Safety of Dams (DSOD) inspections in 2006 and 2012. The inspections revealed voids under the toe of the apron. Based upon reviews of the 2012 inspection reports, DSOD recommended the voids along the existing downstream edge of the discharge apron be repaired. Subsequent dive inspections in 2017 and 2018 revealed further undermining on the right side of the abutment. Apron undermining, if not mitigated, could progress upstream and eventually result in a dam safety risk. The resulting risk would be partial or complete failure of the dam with an uncontrolled water release causing majors damages to native wildlife, private, recreational and federal property. Failure could also lead to injuries or loss of life for the public that may be in the area during the time of the failure.

Cost

The cost assumptions for this project are based on professional judgment of the local engineering and hydro team familiar with this type of work.

Major Project Spending Estimates
(Thousands of Nominal Dollars)

CAPITAL

Planning Order	Description	Operative Date	2024 CWIP	2025 Forecast	2026 Forecast	2027 Forecast	2028 Forecast	2029 Forecast	2030 Forecast	CWIP + 2025 - '30 Total
5800005	Poe Dam Toe Void Install Cutoff Wall DOE	October 2027	811	200	1,166	5,162	92			**7,431**

PACIFIC GAS AND ELECTRIC COMPANY
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Project Summary

Benefits

Protection against undercutting progression in the upstream direction, avoidance of ongoing dive inspections and future emergent repairs. Performing this work will prevent a partial or full dam failure with an uncontrolled water release that would impact native wildlife, private, recreational and federal property. Also doing this work fulfills DSOD recommendation to mitigate further undermining.

Alternatives Considered

Status Quo: Do nothing – This alternative is not recommended. If nothing is done, the erosion and existing voids will continue to deteriorate and increase dam structural concerns potentially resulting in a partial or full dam failure with an uncontrolled water release that would impact native wildlife, private, recreational and federal property. This alternative would also be not fulfilling a commitment to DSOD to resolve the undercutting.

Alternative 1: Install Cutoff Wall (Recommended) – Building the cutoff wall will repair the existing damage and reduce any dam safety issues of a partial or complete failure of the dam with an uncontrolled water release causing majors damages to native wildlife, private, recreational and federal property. This alternative will also comply with a DSOD recommendation and stop further deterioration.

Alternative 2: Defer Cutoff Wall One Year – This alternative is not recommended. Delaying this work will result in further deterioration increasing the risk of a partial or complete failure of the dam with an uncontrolled water release causing majors damages to native wildlife, private, recreational and federal property.

Alternative 3: Repair Toe Voids-Expense – This alternative is not recommended. This alternative includes performing repairs only to the dam apron by addressing spalling and filling voids. This alternative will provide a short-term fix, but additional repairs will be likely needed by 2029.

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Project Summary

Project Title: Poe Equipment Life Cycle Replacement

Major Work Categories: 2L, 2M
Planning Order Numbers: 5772734, 5768011, 5768012, 5788247, 5779527, 5779526
Project Start Date: Various
Project Completion Date: Various
Operative Date (only applies to Capital): Various; see table below

Project Description

Poe Powerhouse (PH) is located on the North Fork of the Feather River between the existing Cresta PH and abandoned Big Bend PHs in Lake Oroville. It is part of PG&E's Poe Hydroelectric Project FERC No. 2107. The powerhouse is a semi-outdoor type and contains two large, vertical, reaction type turbines each directly connected to a synchronous generator. The PH has been in service since 1958 and has a generation capacity of 120 MW.
The Poe PH Deck/Roof Resurface project (5772734) proposes to waterproof the roof deck to mitigate current issues with moisture intrusion into the generator room below the roof deck that houses moisture-sensitive equipment. In addition to waterproofing the roof deck, the leaking roof, door, and possibly walls of the small stairwell building at the downstream end of the roof deck will be addressed to prevent flooding during rainstorms.

The Poe PH U2 Refurbish Penstock Relief Valve (PRV) (5779527) will repair observed leakage, replace a pilot valve, piston seals and repair cavitation damage that have been increased over time due to excessive leakage.
The Poe Exciter projects (5768011 and 5768012) proposes to safely replace the Poe U1 and U2 Excitation Systems with up-to-date reliable units during the Poe planned outage.

The Poe Generator Step-up (GSU) Transformer projects (5779526 and 5788247) will improve the reliability of the Poe Powerhouse GSU Transformers. The scope of work includes replacement of existing 86 MVA transformer banks and associated supporting components (e.g., control cabinet), concrete base, grounding modifications, ISO phase bus duct and all its components, raceway conduits & wiring, bushings, protection and control components, “real-time” monitoring system, and Dissolved Gas Analyzer (DGA) monitoring system.

Justification

The waterproofing of the roof deck will mitigate current issues with moisture intrusion into the generator room that houses moisture-sensitive equipment.
Replacement of the exciters will improve performance, reduce forced outage risks and eliminate the future increase in maintenance requirements.

It no longer feasible to make temporary repairs to the Poe GSU and components since they have reached the end of their useful lives. Poe Transformers are a 3-phase transformer that has been in service since 1965. Spares are not readily available, and refurbishment is not feasible due to the transformer age and elevated gas levels as shown in oil analysis. A failure of the transformer would result in an extended forced outage while replacements were designed, fabricated delivered and installed.

Cost

The cost assumptions for this project are based on professional judgment and historic PG&E cost data for similar work.

PACIFIC GAS AND ELECTRIC COMPANY
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Project Summary

Major Project Spending Estimates
(Thousands of Nominal Dollars)

CAPITAL

Planning Order	Description	Operative Date	2024 CWIP	2025 Forecast	2026 Forecast	2027 Forecast	2028 Forecast	2029 Forecast	2030 Forecast	CWIP + 2025 - '30 Total
5772734	Poe PH Deck/Roof Resurface	December 2025	3,126							**3,126**
5768011	Poe Unit 1 Excitation System Replacement	March 2026	2,846							**2,846**
5768012	Poe Unit 2 Excitation System Replacement	December 2025	2,390	2,048						**4,438**
5779526	Poe PH Trxfmr Repl Bank 1	March 2029	401	-	910	1,129	1,674	1,872		**5,987**
5779527	Poe PH Refurb U2 PRV	November 2030				190	459	1,040	1,593	**3,282**
5788247	Poe GSU Transformer Repl Bank 2	February 2030				190	275	1,560	2,343	**4,369**

Benefits

- Potential avoidance of future O&M expense cost increases associated with maintaining this aging equipment.
- Potential avoidance of a very long forced outage until new components could be fabricated and installed resulting in additional costs for expedited work.
- A higher level of power generation reliability resulting from a reduction in forced outages caused by this aging equipment. This results in a replacement power cost savings for customers.

Alternatives Considered

Status Quo: Do nothing – This alternative is not recommended. This alternative assumes that no action is taken other than minimal maintenance until an unplanned failure. A very long forced outage would occur until new components could be fabricated and installed resulting in additional costs for expedited work and excessive customer replacement power costs.

Alternative1: Equipment life cycle replacement –This is the recommended alternative. This alternative results in the potential avoidance of future O&M expense cost increases associated with maintaining this aging equipment and a higher level of power generation reliability resulting from a reduction in forced outages caused by this aging equipment. This results in a replacement power cost savings for customers.

Alternative 2: Reschedule One Year – This alternative is not recommended. This alternative assumes the projects are rescheduled by one year. This alternative ultimately has the same long-term benefits as the recommended alternative; however, in the short-term, this alternative is not recommended for the same reasons discussed in status quo.

PACIFIC GAS AND ELECTRIC COMPANY
Chapter 3: Hydro Operations Costs
Project Summary

Project Title: Poe License Conditions

Major Work Categories: 3H
Planning Order Numbers: 5781670
Project Start Date: 2022
Project Completion Date: 2028
Operative Date (only applies to Capital): December 2027

Project Description

The Federal Energy Regulatory Commission (FERC) issued a new license for Poe Hydroelectric Project (FERC 2107) effective December 1, 2018. As part of the new license, PG&E must complete recreational enhancements to meet license conditions that incorporate State of California State Water Resources Control Board (SWRCB) 401 Water Quality Certification (WQC) Conditions and United States Department of Agriculture Forest Service (Forest Service)4(e) Conditions. PG&E was required within 1 year of license issuance to submit for review and approval a Recreation Improvement and Monitoring Plan (Recreation Plan). The Poe Recreation Plan submitted outlines the proposed recreational enhancements to meet the license conditions.

Poe Hiking Trail proposes, as result of the new license for Poe Hydroelectric Project (FERC 2107), PG&E to build a new hiking trail. The new trail will extend from Bardees Bar Road to Poe Powerhouse Road.

Sandy Beach (5781670) is a small beach on the left bank of the NFFR. The beach is used by recreationists for gathering, picnicking, fishing, and river access. There is an existing gravel parking lot and a user-defined trail from parking lot to the beach. Vehicular access is directly from a short spur off Highway 70. Because of the angle of the turn and the space available, the site can only be accessed from the southbound lane of the highway. Further, the existing intersection between Highway 70 and the Sandy Beach access road is poorly signed and does not facilitate a right turn from the access road back onto the highway.

Justification

This project is a result of the new FERC Poe 2107 license and required to satisfy a new license condition.

Cost

The cost assumptions for this project are based on the professional judgment of the engineers familiar with this type of work and historic PG&E cost data for similar work.

Major Project Spending Estimates
(Thousands of Nominal Dollars)

CAPITAL

Planning Order	Description	Operative Date	2024 CWIP	2025 Forecast	2026 Forecast	2027 Forecast	2028 Forecast	2029 Forecast	2030 Forecast	CWIP + 2025 - '30 Total
5781670	PoeLC-Poe Hiking Trail	December 2027	250	851	854	653	98			**$ 2,706**

Benefits

PG&E must maintain compliance with the new FERC license for the Poe Hydroelectric Project so that PG&E can continue to operate the Project to benefit customers and the general public.

PACIFIC GAS AND ELECTRIC COMPANY
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Project Summary

Alternatives Considered

Status Quo: Do nothing - This alternative is not recommended. Under this alternative, PG&E would simply not comply with the new FERC license. The result would be fines from FERC and damage to PG&E's good standing with FERC.

Alternative 1: Implement the license conditions – This is the recommended alternative. Under this alternative, PG&E would be in compliance with the new FERC license and PG&E customers and the general public would continue to receive all the benefits of the Poe Project.

PACIFIC GAS AND ELECTRIC COMPANY
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Project Summary

Project Title: Potter Valley License Surrender

Major Work Categories: IG
Planning Order Numbers: 5279332 Project Start Date: 2024
Project Completion Date: 2028
Operative Date (only applies to Capital): Non-Earnings Expense – n.a.

Project Description

Potter Valley is a three-unit, 9.2 MW powerhouse located in the Eel River and East Fork Russian River watersheds. The Potter Valley powerhouse has a normal operating capacity of 9.2 MW.
The current Project license expired in 2022 and is currently operating on an annual license issued by FERC. In 2019 the company determined the project was uneconomic for our customers and started the formal license surrender process. This surrender project will result in the Company surrendering and decommissioning the project through the FERC regulatory process. The Project will operate under annual licenses until the surrender order is issued by FERC consistent with completion of both federal and state-level environmental review processes.

Justification

Under the Federal Power Act (FPA), the owner of a hydropower project must obtain a surrender order from FERC to surrender and decommission its project. On May 11, 2022, FERC ordered PG&E to submit a plan and schedule for the surrender and decommissioning of the Potter Valley Project. This order started the official FERC regulatory process to surrender the Potter Valley Project. The FPA and FERC's implementing regulations specify a comprehensive and rigorous process a licensee must complete to successfully surrender its license. The Licensee must submit an application to FERC who will then complete an environmental review ultimately leading to the issuance of the surrender order by FERC. The schedule for issuance of a surrender order is generally uncertain and can take decades.

Cost

The cost assumptions for this project are based on the professional judgment of the engineers and licensing professionals familiar with this type of work and historic PG&E cost data for similar work.

Major Project Spending Estimates
(Thousands of Nominal Dollars)

NON-EARNINGS EXPENSE

Planning Order	Description	2025 Forecast	2026 Forecast	2027 Forecast	2025-2027 Forecast
5279332	Potter Valley License Surrender	1,311	1,500	2,000	**4,811**

Benefits

Potter Valley Powerhouse is not economic for PG&E's customers, so PG&E is going through the required regulatory process to retire and decommission the associated assets.

Alternatives Considered

Status Quo: Do nothing – This alternative is not recommended. It is an irreversible FERC regulatory requirement for PG&E to surrender and decommission the Potter Valley Project, if PG&E does not do so PG&E will be out of compliance with FERC.

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Alternative 1: Develop and submit to FERC a license surrender application and decommissioning plan - This is the recommended alternative. PG&E is required by FERC to develop and submit to FERC a license surrender application and decommissioning plan for Potter Valley.

PACIFIC GAS AND ELECTRIC COMPANY
Chapter 3: Hydro Operations Costs
Project Summary

Project Title: Potter Valley Van Arsdale Replace Fish Screens

Major Work Categories: 2N **Planning Order Numbers:** 5808949 **Project Start Date:** January 2027
Project Completion Date: December 2029
Operative Date (only applies to Capital): June 2029

Project Description

The fish screens at Van Arsdale prevent fish in the Eel River from entering the tunnel that leads to Potter Valley Powerhouse. While screened water flows to the tunnel, fish are kept on top of the screens and are led into a screw pump and channel that puts them back into the reservoir. The screens and their associated supporting structures are designed to sustain a combination of loading from water head and debris.

An air sparging system is used to assist in keeping debris on the screens to a minimum. The original screens, which were installed in 1994, collapsed in 2006 due to unexpected excessive debris loading on the screens. When the screens and supporting frames were removed and repaired in 2007, they were found to be corroded.

Replacement of both fish screens at Van Arsdale Dam intake is recommended. Recent changes to the license agreement for instream flow requirements support replacement in kind to maintain the required amount of flow in the waterways.

Justification

Potter Valley Powerhouse gets its water from an intake that has a fish screen at Van Arsdale Reservoir. The frame of this fish screen has been experiencing corrosion and structural issues since its replacement in 2006. Impressed cathodic protection was added in 2017 and it initially appeared to slow the rate of corrosion, but subsequent inspections are showing new corrosion and over the last few years holes in structural members have been found. A previous engineering study recommended a Justification for Continued Operation (JCO) that requires annual inspections and a path forward on repair or replacement. The engineering team investigated repairs and another FDOR found that the repair and upgrade would take so much labor that the cost began to approach the cost of replacement.
As part of the repairs of 2007, a new load alarming system, in addition to new supporting structures, was installed. The structure was heavier than the pre-2007 structure, mainly due to the new steel porosity (baffle) plates that replaced the old PVC porosity plates. Mitigation actions in place prior to implementation of the capital project include flow restriction at the intake and annual inspections. The 2006 failure event should be viewed as the worst-case scenario for risk assessment purposes, limiting the consequences of failure of the fish screens to:

- No safety issues resulting from screen collapse.
- Continued passage of water, with installation of fish nets for trapping migrant salmon, and steelhead.
- Generation curtailment.

Cost

The cost assumptions for this project are based on professional judgement of the local engineering and hydro team familiar with this type of work.

PACIFIC GAS AND ELECTRIC COMPANY
Chapter 3: Hydro Operations Costs
Project Summary

Major Project Spending Estimates
(Thousands of Nominal Dollars)

CAPITAL

Planning Order	Description	Operative Date	2024 CWIP	2025 Forecast	2026 Forecast	2027 Forecast	2028 Forecast	2029 Forecast	2030 Forecast	CWIP + 2025 - '30 Total
5808949	Potter Valley Van Arsdale Replace Fish Screens	June 2029				381	734	1,872		**2,987**

Benefits

- Potential avoidance of Notice of Violation (NOV) from regulators as a result of a violation of the Endangered Species Act due to not having a safe passage for salmon and steelhead. The fines would be a cash penalty based on the time of year and whether if it was affecting spawning season.
- Avoidance of future O&M expense cost increases associated with fish screen maintenance.
- Reduction in forced outages and the resulting customers savings in replacement power costs, assuming screen repairs require the powerhouse to be forced out of service to safely repair the fish screens.

Alternatives Considered

Status Quo: Do Nothing – This alternative is not recommended due to the advanced deteriorating condition of the fish screens. This alternative may result in receiving an NOV from regulators as a result of a violation of the Endangered Species Act due to not having a safe passage for salmon and steelhead. In addition, this alternative results in future O&M expense cost increases associated with fish screen maintenance.

Alternative 1: Replace both screens and frames with a new design – This is the recommended alternative. This alternative results in the potential avoidance of a NOV from regulators and the avoidance of future O&M expense cost increases associated with fish screen maintenance requiring a forced outage.

Alternative 2: Replace one screen and frame with a new design – This alternative is not recommended. This alternative includes all the costs associated with design, permitting, mobilization, and post design as replacing both screens (Alternative 1). This new screen would likely become the primary screen. However, the other screen would continue to be at risk of failure and may result in receiving an NOV from regulators. In addition, this alternative results in future O&M expense cost increases associated with fish screen maintenance on the old fish screen.

Alternative 3: Replace both screens and frames in kind - This alternative is not recommended. The labor to install this design is higher than the new design and it has all the issues that we have with the current screens.

PACIFIC GAS AND ELECTRIC COMPANY
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Project Summary

Project Title: Hydro Modernization Program

Major Work Categories: 2M
Planning Order Numbers: 5787972, 5801758, 5803541, 5804208, 5804583, 5804584, 5806397, 5809582, 5812241, 5812242, 5812243, 5812244, 5812245, 5812827
Project Start Date: 2024
Project Completion Date: 5787972 – 2025, 5801758 – 2029, 5803541 – 2029, 5804208 – 2030, 5804583 – 2032, 5804584 – 2029, 5806397 – 2030, 5809582 – 2029, 5812241 – 2026, 5812242 – 2027, 5812243 – 2028, 5812244 – 2029, 5812245 – 2029, 5812827 – 2031
Operative Date:
5787972 – December 2025, 5801758 – October 2029, 5803541 – October 2028, 5804208 – August 2029 5804583 – December 2031, 5804584 – December 2029, 5806397 – October 2029, 5809582 – October 2028 5812241 – December 2026, 5812242 – December 2027, 5812243 – December 2028, 5812244 – December 2029, 5812245 – December 2029, 5812827 – December 2024

Project Description

The Hydro Modernization Program will provide a control platform that is simple and easy for operators to use. Standards will be developed to upgrade Remote Terminal Units (RTUs) with Programmable Logic Controllers (PLCs) and install compatible instrumentation. This improves data acquisition from intelligent instrumentation and provides the foundation for automated control. The level of control will be dependent on the ability to add controllers and increased instrumentation. Interim mitigation will be to upgrade instrumentation to the current standard as they reach end of life, until the entire powerhouse and supporting infrastructure are able to be upgraded by the program. Cresta Powerhouse phase 1 has been completed as the pilot powerhouse to be updated to the new Power Generation Modernization standards.

Justification

PG&E Power Generation – Hydro is preparing to make a digital transition of its powerhouse automation infrastructure and other supporting infrastructure. A Modernization Program has been established to develop baseline standards, baseline specifications, system requirements, and templates for use in subsequent phases by operations and project teams. The new system is to be designed to improve operational reliability and visibility, increase system availability, provide data for predictive maintenance and analytics, and enhance operational safety.

Cost

The cost assumptions for this project are based on the professional judgment of the engineers familiar with this type of work and historic PG&E cost data for similar work.

Major Project Spending Estimates (Thousands of Nominal Dollars)

Planning Order	Description	Operative Date	CWIP 2024 Recorded	2025 Fore-cast	2026 Fore-cast	2027 Fore- cast	2028 Fore- cast	2029 Fore- cast	2030 Fore-cast	CWIP + 2025-2030 Forecast
5787972	SCADA 2024 RTU Life Cycle Replacement	December 2025	107							**107**
5801758	Poe PH Modernization PHM	October 2029	5,076		$292	$384	$3887	$4443		**14,092**

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5803541	Wise 1 PH Modernization PHM	October 2028	781		$21	$433	$1784	$190		**3,209**
5804208	Pit 4 Unit 2 PH Modernization PHM	August 2029				$143	$1009	$1815	$187	**3,154**
5804583	Balch 2 & 3 PH Modernization PHM	December 2031	1,476		$240	$174	$81		$1023	**2,995**
5804584	Cresta PH Modernization Phase 2 PHM	December 2029	102		$125	$249	$1618	$1564		**3,658**
5806397	Drum 1 PH U1-4 Install Modernization PHM	October 2029	9			$420	$233	$4473	$117	**5,252**
5809582	Pit 1 PH U1 & U2 Modernization PHM	October 2028			$248	$1046	$1601	$208		**3,104**
5812241	SCADA 2026 RTU Life Cycle Replacement	December 2026			$3105					**3,105**
5812242	SCADA 2027 RTU Life Cycle Replacement	December 2027				$6163				**6,163**
5812243	SCADA 2028 RTU Life Cycle Replacement	December 2028					$5255			**5,255**
5812244	SCADA 2029 RTU Life Cycle Replacement	December 2029						$6366		**6,366**
5812245	SCADA 2030 RTU Life Cycle Replacement	December 2030							$5623	**5,623**
5812827	Hydro Modernization Program	December 2024			4,771	10,000	10,000	11,000	11,000	**46,771**

Benefits

Increasing the level of control and data collection will allow for remote troubleshooting and will decrease miles driven by O&M and support staff, improving operational safety. Moving toward a predictive maintenance model will improve reliability and availability to the benefit of customers.

Alternatives Considered

Status Quo: Do nothing – This alternative is not recommended. This alternative does not allow for an increasing level of control and data collection that will allow for remote troubleshooting and decrease miles driven by O&M and support staff, improving operational safety. This alternative does not move PG&E toward a predictive maintenance model resulting in improved reliability and availability to the benefit of customers.

Alternative 1: Implement Hydro Modernization program – This is the recommended alternative. It will result in an increasing level of control and data collection that will allow for remote troubleshooting and will decrease

miles driven by O&M and support staff, improving operational safety. This alternative moves PG&E toward a predictive maintenance model and improves reliability and availability to the benefit of customers.

PACIFIC GAS AND ELECTRIC COMPANY
Chapter 3: Hydro Operations Costs
Project Summary

Project Title: Spillway Program
Major Work Categories: 2L, 2N, 3H, AX, IG
Planning Order Numbers: Various
Project Start Date: Various
Project Completion Date: Various
Operative Date (only applies to Capital): Various

Project Description

The Spillway Program is a program developed to inform and execute a collection of improvements to the spillways that exist at PG&E Hydro Dam facilities. These improvements to the spillways include but not limited to upgrades and/or replacement of riprap, concrete walls, slabs, piers, footings, drainage systems, primary and secondary structural systems and members. These projects improve the spillway condition and operation availability at PG&E Hydro Dam facilities spillway and help these facilities maintain operational capacity during normal operational and flood operational conditions.

Tiger Creek Spillway



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Project Summary

Wall of Belden Spillway



Justification

These projects are mitigations or controls to the large uncontrolled water release (LGUWR) risk. More specifically, these projects are part of the Maintenance (LGUWR-C001 – Maintenance) control projects or Spillway (LGUWR-M002 – Spillway Remediation) projects included in PG&E's 2024 Risk Assessment and Mitigation Phase (RAMP) filing. PG&E is responsible for maintaining the spillways as required by the PG&E Dam Safety Program. This program is mandated by Federal and State compliance requirements which aligns with the requirement to maintain operational capacity to operate the dam safely to keep the public safe and to prevent harm to public and environmental resources. This program follows the FERC engineering guidelines and DSOD requirements.

The CBR for LGUWR-C001 is 0.4. The CBR for LGUWR-M002 is 1.1. PG&E's risk mitigation strategies are selected to ensure that safety remains PG&E's top priority even when the quantitative modelling indicates the costs are higher than the modeled value of risk reduction. Other factors are considered when selecting mitigations, including the following:

Compliance: PG&E dams are regulated by two governmental agencies: FERC per Title 18 - Conservation of Power and Water Resources, Part 12 - Safety of Water Power Projects and Project Works, and DSOD per CCR Title 23 - Waters. PG&E is responsible for meeting compliance requirements and obligations to ensure its dams and associated components meet design requirements and can be operated in a reliable and safe manner. For example, dams are required to safely pass the design storm flows and not fail catastrophically for earthquakes up to the design load. Critical components such as spillway gates and LLOs, along with their power supply and backups, need to be operational during dam safety emergencies and routine operations.

Operational and Execution Considerations: Power Generation follows industry best practices as identified in the ISO 55001 certification that it achieved in March 2022. These practices include a prudent risk-informed asset management approach to managing asset risk through asset lifecycle. Absent appropriate funding to

ensure continued risk reduction and prevention, a serious safety or reliability incident will likely occur in the future. The investments needed to retrofit the dams and components to meet design requirements or for upkeeping do not always have CBR scores greater than one. In general, mitigation projects that are large, complex, and require multiyear design and construction tend to have lower CBRs because of the higher implementation costs.

CBR/Bow Tie Modeling Limitations or Uncertainties: The risk reductions for these programs may be underestimated due to data and modeling limitations. An example of such a limitation is that significant deficiencies identified by our regulators that are not satisfactorily mitigated in a timely manner could result in revoking of the license and a halt in operations. This is difficult to quantify and currently not captured in the risk modeling.

All projects within the LGUWR-C001 – Maintenance controls and LGUWR-M002 – Spillway Remediation mitigations are essential in ensuring the long-term safe and reliable operations of PG&E dams and are directed at preventing a large uncontrolled water release incident.

Cost

The cost assumptions for this project are based on professional judgment of the local engineering and hydro team familiar with this type of work.

Major Project Spending Estimates
(Thousands of Nominal Dollars)

CAPITAL/EXPENSE

Planning Order	Description	CBR[1]	Operative Date	2024 CWIP	2025 Forecast	2026 Forecast	2027 Forecast	2028 Forecast	2029 Forecast	2030 Forecast	CWIP + 2025 - '30 Total
5047495	Drum Spillways Maint SAIP	0.4	n.a.	n.a.				n.a.	n.a.	n.a.	**0**
5260129	Pit 6 Spilwy Aprn/Tailrce Remove Block 1	7.9	n.a.	n.a.			156	n.a.	n.a.	n.a.	**156**
5272032	Drum Spillways FSP Engr SAIP	n.a.	n.a.	n.a.	50	50		n.a.	n.a.	n.a.	**100**
5272053	DeSabla Spillways FSP Engr SAIP	n.a.	n.a.	n.a.	767	100		n.a.	n.a.	n.a.	**867**
5272054	Motherlode Spillways FSP Engr SAIP	n.a.	n.a.	n.a.	50	50		n.a.	n.a.	n.a.	**100**
5272061	Shasta Spillways FSP Engr SAIP	n.a.	n.a.	n.a.	50	50		n.a.	n.a.	n.a.	**100**
5272062	Kings Crane Spillways FSP Engr SAIP	n.a.	n.a.	n.a.	50			n.a.	n.a.	n.a.	**50**
5808206	Pit 7 Dam Recoat Radial Gate GIR	7.3	n.a.	8	-	-	-	-	104	278	**390**
5286332	Bucks Storage Repair Spillway Joints & C	n.a.	n.a.	n.a.	220	50		n.a.	n.a.	n.a.	**270**
5287006	Wishon Spillway Repair SAIP	n.a.	n.a.	n.a.	50	50		n.a.	n.a.	n.a.	**100**
5287008	Drum Forebay Repr Spillway Joints SAIP	0.000006	n.a.	n.a.	150	100	272	n.a.	n.a.	n.a.	**522**
5794027	Butt Valley Spillway Improv SAIP	3.0	2030				476	1,835	2,080	2,811	**7,202**

[1] CBRs are only provided for LGUWR mitigation or control projects with operative dates and/or costs within the 2027-2030 GRC period and beyond. CBRs are not calculated for programs with pre 2027 operative dates.

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Planning Order	Description	CBR[1]	Operative Date	2024 CWIP	2025 Forecast	2026 Forecast	2027 Forecast	2028 Forecast	2029 Forecast	2030 Forecast	CWIP + 2025 - '30 Total
5794031	Lower Bucks Spillway Restoration SAIP DOE	n.a.	2025	12,687	10,421	194					**23,302**
5794035	Tiger Creek Reg Spillway Improv SAIP	0.001	2030	9,496	1,312	26,195	42,197	19,776	7,676	3,701	**110,354**
5808125	Belden Spillway Imprv Walls SAIP IRRM	4.6	2029	265	6,500	1,500	2,000	18,000	10,000	50	**38,315**
5800225	Pit 1 Log Boom Repair SAIP	n.a.	2025		100						**100**
5805416	Lake Almanor Spillway Joint Rpl SAIP -ST	0.04	2028		4,500	3,882	7,190	6,422			**21,994**
5806700	Lake Tabeaud Spillway Retrofit	0.02	2031					183	260	609	**1,053**
5806805	Butt Valley Wall Reinforcement SAIP – ST	0.07	2032	23	-	-	238	275	312	1,874	**2,723**
5806806	Bucks Storage Erosion Protect SAIP – ST	0.3	2029	26	-	-	238	459	1,040		**1,763**
5808126	Cape Horn Erosion Protection - SAIP - ST	0.02	2029	22	-	-	254	460	1,040		**1,776**
5808282	Lake Almanor Spillway Improv SAIP LT	0.06	2030				250	250	2,000	2,000	**4,500**
5808283	RV Spillway Armor Splash Pool SAIP IRRM	0.002	2029	18	-	-	250	459	1,040		**1,768**
5808284	NBC Spillway Improvements SAIP LT	0.4	2032							469	**469**
5808285	Belden Spillway Inst Log Boom SAIP IRRM	44.6	2027	42	385	536	3,106	61			**4,131**
5805416	Lake Almanor Spillway Rpl Jt SAIP IRRM	0.04	2028	5,207	4,500	5,000	7,000	7,000			**28,707**
5806780	Relief Spillway Impr Lower Training Wall	0.4	2030				300	750	2,500	2,500	**6,050**
5808880	Belden Forebay Spillway Improv SAIP LT	89.6	2032				238	229	520	469	**1,456**
5809402	Crane Valley Dam SAIP	n.a.	2025	105	918						**1,023**
5812083	Spaulding 2 Dam Rock Anchorage	12.5	2029				143	92	260	14	**509**

Benefits

- Reduce the risk of dam failure and possible environmental/public safety concerns that come as a result.
- Increase reliability of PG&E Hydro Dam Facilities operational capacity during normal operating conditions and high flow/flood conditions.
- Reduction in future expense cost where structures are replaced with newer construction.
- Reduce the risk of large uncontrolled water release.

PACIFIC GAS AND ELECTRIC COMPANY
Chapter 3: Hydro Operations Costs
Project Summary

Alternatives Considered

Status Quo: Do nothing – This alternative is not recommended. This alternative assumes that no action is taken other than minimal maintenance until unplanned failure. A very long forced outage would occur until new components could be fabricated and installed resulting in additional costs for expedited work and excessive customer replacement power costs.

*Alternative 1: Equipment life cycle replacement –*This is the recommended alternative. This option may help avoid future O&M expense increases associated with maintaining aging equipment and could improve power generation reliability by reducing forced outages caused by this equipment. This may lead to power cost savings for customers.

Alternative 2: Reschedule One Year – This alternative is not recommended. This alternative assumes the projects are rescheduled by one year. This alternative ultimately has the same long-term benefits as the recommended alternative; however, in the short-term, this alternative is not recommended for the same reasons discussed in status quo.

PACIFIC GAS AND ELECTRIC COMPANY
Chapter 3: Hydro Operations Costs
Project Summary

Project Title: Road Access and Safety Improvements

Major Work Categories: 2N, 2P
Planning Order Numbers: 5806264, 5805398, 5792563, 5798454, 5792584
Project Start Date: Various
Project Completion Date: Various
Operative Date (only applies to Capital): Various; see table below

Project Description

Road Access and Safety Improvements is a program developed to execute a collection of improvements to both the publicly accessible and private roads across all PG&E Power Generation facilities including but not limited to repaving, grading, improving slope stability, improving drainage, correcting sightlines, and updating required safety and informational signage. These projects correct road damage caused by age and use as well as weather damage that caused failures of specific roadway segments.

JBB Willow Creek Rd Stabilization- Moderate to severe weather in this area which was previously impacted by forest fires appear to have contributed to the premature failure of the roadway in several locations. Repair damage and remove debris from Willow Creek Siphon Road to allow vehicular access to the north and south portions of the siphon.

Pit 3 Repave Road- This project proposes to address pavement rehabilitation, drainage improvements, and addition of delineators and reflectors on Pit 3 Road from 5 Corners to the Pit 3 Powerhouse, a distance of approximately 6 miles.

DeSabla PH Road Improvements- This project proposes to address pavement rehabilitation, drainage improvements, and the addition of delineators and reflectors.

Philadelphia Canal Road Improvements- Continuous erosion of the road at both project sites create a safety hazard for PG&E personnel and the public. The continued erosion of the road has resulted in a decrease in road width, limiting the space to safely traverse the road. This project will widen the road with rock fill and remove the guard rail. If the road is widened enough there will be no need for a guardrail. In addition, 22" steel pipe will be extended to accommodate the road improvements.

Caribou Road Improvements- Two major slides washed out sections of the road and have resulted in road closure. The road is a primary access point for the Caribou 1 Powerhouse (PH) and Caribou 2 PH. This project will widen the road with rock fill and gabion basket to allow safe 2-way traffic. Culverts will also be installed with inlets to direct water away from the road base, stopping further erosion and keep pooling water off the surface. Hydro seeding will also be used on steeper hillsides with loose soil make up.

Justification

PG&E is responsible for maintaining paved roadways under Federal Energy Regulatory Commission (FERC) licensing agreements. Additionally, where ownership is maintained by the United States Department of Agriculture (USDA) Forest Service (USFS), this agency also requires that roads be maintained to the assigned maintenance level of the applicable roadway management plans. For PG&E maintained roads outside the FERC boundary there is no mandate, but maintenance is required to ensure continued access to remote facilities.

PACIFIC GAS AND ELECTRIC COMPANY
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Project Summary

Cost

The cost assumptions for this project are based on professional judgment and historic PG&E cost data for similar work.

Major Project Spending Estimates
(Thousands of Nominal Dollars)

CAPITAL

Planning Order	Description	Operative Date	2024 CWIP	2025 Forecast	2026 Forecast	2027 Forecast	2028 Forecast	2029 Forecast	2030 Forecast	CWIP + 2025 - '30 Total
5798454	Philadelphia Canal Road Improvements	December 2028	55	-	122	246	3,063			**3,485**
5792563	JBB Willow Creek Rd Stabilization	October 2026	363	401	5,749	95				**6,609**
5792584	Pit 3 Repave Road	October 2026	650		4,203	95				**4,948**
5805398	DeSabla PH Road Improvements	December 2025	3,996	1,500						**5,496**
5806264	Caribou Road Improvements 2023	December 2025		60						**60**

Benefits

Potential avoidance of future O&M expense cost increases associated with maintaining this deteriorating asset. Restore vehicular access to facilities cut off by severe weather. Reduce hazards associated with driving. Ensure continued safe access of generation assets and compliance with FERC Licenses.

Alternatives Considered

Status Quo (Do Nothing) - This alternative is not recommended given that the age of the roads and the difficulty in safely accessing various PG&E power generation assets. Under this alternative, where ownership is maintained by the USFS, PG&E will not comply with this agency's requirements that roads be maintained to the assigned maintenance level of the applicable roadway management plans. For PG&E maintained roads outside the FERC boundary, the roads would deteriorate to appoint that continued access to remote facilities would not be possible and PG&E would be in violation of its FERC Licenses.

Alternative 1: Repair existing assets - This alternative proposes PG&E does repairs. This alternative is not preferred given that O&M expense cost increases associated with maintaining this aging equipment. This alternative may also jeopardize PG&E's ability to comply with FERC Licenses.

Alternative 2: Replacement with in-kind structures - This alternative will be used for roads that have reached their end of life and need to be replaced. This is cost savings to the customer as standard designs and materials are readily available. This alternative avoids future O&M expense cost increases associated with maintaining this deteriorating asset. This alternative also ensures PG&E is in compliance with its FERC Licenses.

Alternative 3: Replacement with improved roadways and stabilization methods – This alternative applies to roads that have failed due to faulty design, or a change is condition prompting a new design. This could be installing new or larger culverts for drainage, expanding turnouts on roads for safer travels in adverse weather, and/or erosion protection on ground areas that have become unstable due to weather. This alternative avoids future O&M expense cost increases associated with maintaining this deteriorating asset. This alternative also ensures PG&E is in compliance with its FERC Licenses.

PACIFIC GAS AND ELECTRIC COMPANY
Chapter 3: Hydro Operations Costs
Project Summary

Project Title: Rock Creek PH Equipment Life Cycle Replacement
Major Work Categories: 2M
Planning Order Numbers: 5802885, 5808344, 5812905
Project Start Date: Various
Project Completion Date: Various
Operative Date (only applies to Capital): Various; see table below

Project Description

The Rock Creek Powerhouse (PH) is part of PG&E's Rock Creek - Cresta Hydroelectric Project (FERC 1962). This powerhouse is a two-unit PH with a generation capacity of 120MW. The 13.8kV main bus is connected to the low voltage bushings of the generator step-up (GSU) main transformer banks no. 1 and 2.

Rock Creek PH Replace Generator Step-Up Unit (GSU) Transformer Bank 1 ABC & SP (5802885) – There are six single-phase, 13.8/220KV, oil-insulated, self-cooled power transformers split between two banks at Rock Creek PH, as well as a common spare. The transformers are beyond their life expectancy. Replacement of bank 1 is warranted given the equipment age and conditions. There has also been a significant increase in procurement lead time for transformers and with only one reliable spare there are concerns of failure resulting in an extended forced outage. PG&E will replace the three single-phase transformers with one, three-phase transformer.

Rock Creek PH Replace GSU Transformer Bank 2 ABC (5808344) – There are six single-phase, 13.8/220KV, oil-insulated, self-cooled power transformers split between two banks at Rock Creek PH, as well as a common spare. The transformers are beyond their life expectancy. Replacement of bank 2 is warranted given the equipment age and conditions. There has also been a significant increase in procurement lead time for transformers and with only one reliable spare there are concerns of failure resulting in an extended forced outage. PG&E will replace the three single-phase transformers with one, three-phase transformer. This will allow for possible use of a single, shared spare transformer rather than procurement of site-specific transformers that have only one application.

Rock Creek U2 Replace Gen Shaft (5812905) – The coupling connection between the existing Rock Creek U2 generator shaft and the turbine shaft is currently temporarily shimmed to align the shafts for operation. The use of shims is not recommended for coupling between the mating surfaces. Excessive vibration (wobble) has already been identified in the rotating equipment during operation. The most economical solution to resolve the surface mating and alignment issue is to procure a new generator shaft that will be fabricated to match up with the turbine shaft without requiring the use of shims. Continuing operation in its existing status is not recommended for an extended period and should be resolved to reduce the risk of excessive wear and tear and forced outage potential if the problem becomes worse and deems the unit inoperable until it’s fixed.

Justification

Rock Creek PH Replace GSU Transformer Bank 1 ABC & SP: Due to age and continued degradation of the transformers, replacement of the bank is necessary to reduce risk of failure. Failure of the bank would cause an extended forced outage at Rock Creek U1 resulting in replacement power costs for customers.

Rock Creek PH Replace GSU Transformer Bank 2 ABC: Due to age and continued degradation of the equipment post refurbishment, replacement of the bank is necessary to reduce risk of failure. Failure of the

bank would cause an extended forced outage at Rock Creek U2 resulting in replacement power costs for customers.

Rock Creek U2 Replace Gen Shaft: The existing connection between the U2 generator and turbine shafts needs to be corrected for proper alignment of the rotating equipment to reduce/eliminate wobble during operation. Continuing operation in this condition may cause unnecessary wear and increased vibration during operation with potential to force the unit out of service until a new shaft is procured and installed.

Cost

The cost assumptions for this project are based on professional judgment and historic PG&E cost data for similar work.

Major Project Spending Estimates
(Thousands of Nominal Dollars)

CAPITAL

Planning Order	Description	Operative Date	2024 CWIP	2025 Forecast	2026 Forecast	2027 Forecast	2028 Forecast	2029 Forecast	2030 Forecast	CWIP + 2025 - '30 Total
5802885	Rock Creek PH Repl GSU XFMR Bank 1ABC&SP	December 2030	194	-	64	2,035	2,417	2,134	1,801	**8,644**
5808344	Rock Creek PH Repl GSU XFMR Banks 2ABC	October 2029	17	-	78	2,157	1,927	4,421		**8,599**
5812905	Rock Creek PH U2 Repl Gen Shaft	December 2031					138	1,560	2,343	**4,041**

Benefits

- Potential avoidance of future O&M expense cost increases associated with maintaining this aging equipment.
- Potential avoidance of higher capital costs for equipment/system replacement on an expedited basis if any of the major equipment or systems fails.
- A higher level of power generation reliability resulting from a reduction in forced outages caused by this aging equipment. This results in a replacement power cost savings for customers.

Alternatives Considered

Status Quo: Do nothing – This alternative is not recommended. This alternative assumes that no action is taken other than minimal maintenance until an unplanned failure. A very long forced outage would occur until new components could be fabricated and installed resulting in additional costs for expedited work and excessive customer replacement power costs.

Rock Creek PH Replace GSU Transformer Bank 1 ABC & SP:
Alternative 1: Repair existing transformers – This alternative is not recommended. This alternative assumes that no action is taken other than minimal maintenance until an unplanned failure. A very long forced outage would occur until new components could be fabricated and installed resulting in additional costs for expedited work and excessive customer replacement power costs.

Alternative 2: Single-Phase Transformer Replacement – This alternative is not recommended. Replacing the existing transformer bank and spare with single phase transformers is not the optimum approach to meet the

demands of larger industrial operations. These transformers are less efficient over long distances and cannot deliver the consistent high-energy output required for grid stability.

Alternative 3: 3 Phase Transformer Replacement – This is the recommended alternative. Replacing the existing transformer bank with one three-phase transformer along with one universal spare that may be shared with three or more sites results in the potential avoidance of future O&M expense cost increases associated with maintaining this aging equipment and a higher level of power generation reliability resulting from a reduction in forced outages caused by this aging equipment. This results in a replacement power cost savings for customers. Also, having a spare transformer that may be used at multiple sites will result in replacement power costs savings for customers in the event of a transformer failure at one of these sites and the avoidance of higher capital costs for equipment/system replacement on an expedited basis.

Rock Creek PH Replace GSU Transformer Bank 2 ABC:
Alternative 1: Repair existing transformers – This alternative is not recommended. Refurbishment was previously completed on the transformer including bushings; however, it has only extended its operating life for a short-term. The condition continues to degrade even after the refurbishment efforts and now a full replacement is required. This alternative may result in a very long forced outage until new components could be fabricated and installed resulting in additional costs for expedited work and excessive customer replacement power costs.

Alternative 2: Single-Phase Transformer Replacement – This alternative is not recommended. Replacing the existing transformer bank with single phase transformers is not the optimum approach to meet the demands of larger industrial operations. These transformers are less efficient over long distances and cannot deliver the consistent high-energy output required for grid stability.

Alternative 3: 3 Phase Transformer Replacement – This is the recommended alternative. Replacing the existing transformer bank with one three-phase transformer results in the potential avoidance of future O&M expense cost increases associated with maintaining this aging equipment and a higher level of power generation reliability resulting from a reduction in forced outages caused by this aging equipment. This results in a replacement power cost savings for customers. Also, having a spare transformer that may be used at multiple sites will result in replacement power costs savings for customers in the event of a transformer failure at one of these sites and the avoidance of higher capital costs for equipment/system replacement on an expedited basis.

Rock Creek U2 Replace Gen Shaft:
Alternative 1: Repair Gen Shaft – This alternative is not recommended. Consideration was made to remove the existing generator shaft and machine to fit the turbine shaft appropriately, however, attempts to perform similar scope on other projects have proven to be challenging, costly and with minimal improvements.

Alternative 2: Replace Gen Shaft – This is the recommended alternative. Procuring a new generator shaft, fabricated to mate up properly to the turbine shaft will result in the potential avoidance of future O&M expense cost increases associated with maintaining this aging equipment and a higher level of power generation reliability resulting from a reduction in forced outages caused by this aging equipment. This results in a replacement power cost savings for customers.

PACIFIC GAS AND ELECTRIC COMPANY
Chapter 3: Hydro Operations Costs
Project Summary

Project Title: Rock Creek-Cresta FERC-1962 Relicensing
Major Work Categories: 3H **Planning Order Numbers:** 5812238 **Project Start Date:** 2027
Project Completion Date: 2033
Operative Date (only applies to Capital): December 2032

Project Description

Rock Creek is a two-unit, 119 MW powerhouse located on the North Fork Feather River. Cresta is a two-unit, 70 MW powerhouse located on the North Fork Feather River. The current Rock Creek-Cresta (RCC) Project FERC 1962 license expires in 2034. This relicensing project is expected to result in the Company obtaining a new long-term Federal Energy Regulatory Commission (FERC) license for the Project, which will allow PG&E to continue to provide safe and reliable electric generation to our customers in a responsible and environmentally sensitive manner. FERC's Integrated Licensing Process is the default process to obtain a new 40 to 50-year operating license.

Justification

Under the Federal Power Act (FPA), the owner of a hydropower project must obtain a license from FERC to operate its project. At the end of the license term, a licensee may apply to relicense its project. The FPA and FERC's implementing regulations specify a comprehensive and rigorous process a licensee must complete to successfully renew its license. The minimum 5-year regulatory process, which often takes substantially longer to complete, includes extensive stakeholder involvement, performance of comprehensive resource studies and balancing of complex societal and environmental issues. Licensees must be highly engaged with stakeholders and plan relicensing activities prior to the relicensing process beginning with filing of a Notice of Intent and Pre-Application Document and must continue relicensing activities through filing the License Application and subsequent environmental review processes leading to issuance of the new license by FERC. The schedule for issuance of a new license is generally uncertain and can take decades.

Cost

The cost assumptions for these projects are based on the professional judgment of the engineers and licensing professionals familiar with this type of work and historic PG&E cost data for similar work.

Major Project Spending Estimates
(Thousands of Nominal Dollars)

CAPITAL

Planning Order	Description	Operative Date	2024 CWIP	2025 Forecast	2026 Forecast	2027 Forecast	2028 Forecast	2029 Forecast	2030 Forecast	CWIP + 2025 - '30 Total
5812238	Rock Creek-Cresta FERC-1962 Relicensing	December 2032				285	665	1,541	4,966	**7,457**

Benefits

The benefit of this project is to obtain a new FERC license for the RCC Project so that PG&E can continue to operate these powerhouses to benefit customers and the general public.

PACIFIC GAS AND ELECTRIC COMPANY
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Project Summary

Alternatives Considered

Status Quo: Do nothing - This alternative is not recommended. Under this alternative, PG&E would simply not begin the FERC licensing process. The result of which would be PG&E's current FERC license not being renewed, and PG&E would not be able to continue operating the Rock Creek and Cresta powerhouses after the current license expires. If PG&E would choose to continue to operate, exorbitant fines from FERC would be incurred and potentially risking PG&E's good standing with FERC.

Alternative 1: Relicense the RCC Project – This is the recommended alternative. Under this alternative, PG&E customers and the general public would continue to receive all the benefits of the RCC Project.

PACIFIC GAS AND ELECTRIC COMPANY
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Project Summary

Project Title: Salmon Habitat Expansion Agreement

Major Work Categories: 3H
Planning Order Numbers: 5781662, 5802861
Project Start Date: 2009
Project Completion Date: 2032
Operative Date (only applies to Capital): 5781662 – December 2029, 5802861 – December 2031

Project Description

The Habitat Expansion Agreement for Central Valley Spring-Run Chinook Salmon and California Central Valley Steelhead (HEA) was entered into in November 2007 and amended in March 2011 by and among PG&E, American Rivers, California Department of Fish and Game, California Department of Water Resources (DWR), State Water Contractors, Inc., United States Department of Agriculture Forest Service, United States Department of Commerce National Marine Fisheries Service (NMFS), and the United States Fish and Wildlife Service. Under the agreement, PG&E and DWR, as licensees of the hydroelectric projects on the Feather River, must identify, evaluate, and select proposed actions to expand spawning, rearing, and adult holding habitat for Spring-Run and Steelhead in the Sacramento River Basin. Once selected by PG&E and DWR, the proposed actions have to be approved by NMFS with input from the other parties, and then PG&E and DWR will implement the approved actions.

PG&E and DWR have identified a viable suite of projects that will satisfy the HEA criteria – 1) creation of side channel habitat in the lower Feather River; and 2) contribution of funding to NMFS' North Yuba Reintroduction Pilot Program – and plan to submit a Habitat Expansion Plan for NMFS approval in 2025. Once approved by NMFS, PG&E and DWR will begin implementation of the habitat expansion actions.

Justification

The HEA is a collaborative effort by PG&E and DWR. The specific goal of the HEA is to expand spawning habitat sufficiently to accommodate a net increase of 2,000 to 3,000 spring-run Chinook salmon, as an alternative to the Resource Agencies or other parties seeking project-specific fish passage prescriptions or license conditions. The HEA was negotiated to provide an alternative to NMFS' exercising its Section 18 mandatory conditioning authority for fish passage under the Federal Power Act in the ongoing FERC relicensing proceedings for DWR's Oroville Facilities and PG&E's Upper North Fork Feather River Project and Poe Project, as well as the existing license for the Rock Creek Cresta Project, all of which are located in the Feather River sub-basin of the Sacramento River basin.

This project is necessary for compliance with the Habitat Expansion Agreement and to avoid the potential for much more costly fish passage prescriptions as part of the FERC licenses.

PACIFIC GAS AND ELECTRIC COMPANY
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Project Summary

Cost

The cost assumptions for this project are based on the professional judgment of the engineers and licensing professional familiar with this type of work.

Major Project Spending Estimates
(Thousands of Nominal Dollars)

CAPITAL

Planning Order	Description	Operative Date	2024 CWIP	2025 Forecast	2026 Forecast	2027 Forecast	2028 Forecast	2029 Forecast	2030 Forecast	CWIP + 2025 - '30 Total
5781662	Poe LC- HEA Implementation	December 2029		250	1,165	238	229	2,080	586	**4,548**
5802861	Salmon HEA Implement - UNFFR LC	December 2031	1,217	750	3,494	713	688	6,241	1,757	**14,861**

Benefits

The benefit of this project is a lower customer cost to relicense and meet the license conditions for PG&E's Feather River Hydroelectric projects (Upper North Fork Feather River, Poe, and Rock Creek-Cresta). The HEA fully mitigates for any presently unmitigated impacts due to the blockage of fish passage of all fish species caused by the Feather River Hydroelectric Projects.

Alternatives Considered

Status Quo: Do nothing – This alternative is not recommended. The alternative to the HEA would be fish passage prescription from NMFS that would likely require a trap-and-transport program for spring-run Chinook salmon for DWR's and PG&E's facilities. This alternative results in higher costs to relicense and meet the license conditions for PG&E's Feather River Hydroelectric projects (Upper North Fork Feather River, Poe, and Rock Creek-Cresta).

Alternative 1: Implement HEA – This is the recommended alternative. PG&E and DWR pursued the HEA alternative due to concerns over the high estimated cost of the trap-and-transport program and its low potential for success.

PACIFIC GAS AND ELECTRIC COMPANY
Chapter 3: Hydro Operations Costs
Project Summary

Project Title: Salt Springs 1 Penstock Excess Flow Prot

Major Work Categories: 2N **Planning Order Numbers:** 5788233 **Project Start Date:** April 2020 **Project Completion Date:** May 2025
Operative Date (only applies to Capital): December 2025

Project Description

Salt Springs Powerhouse Unit 1 has two 120" diameter riveted steel pipes (Penstock A and B) that are each controlled by 129" diameter butterfly valves. Penstock A supplies the turbine as well as a 78” free discharge valve to the river. Penstock B supplies water to the canal through the 57” bypass valve, and it has a 24” cone valve and a 78” cone valve that both discharge into the river.

Corrective Action Program (CAP), Issue 116981780, identified that Penstock B has no protection or monitoring system in place to close the Penstock Shutoff Valve (PSV), if there was a Penstock B failure. Penstock A has a low-pressure device, but it was also identified that Penstock A's low-pressure protection was inadequate since the PSV will not close if the Turbine Shutoff valve (TSV) closes. If a penstock ruptures and the PSV does not close immediately, water will be uncontrollably released for at least 1.5 hours until an operator can close the PSV via a manual push button inside the unmanned powerhouse.

The scope of this project is to install a Flow Meter from Accusonic on both Penstock A and B that will trip the 129" PSVs if an excess flow condition occurs. Additionally, add capability for the Penstock A and B PSV's to be remotely closed via SCADA (Tiger Creek Switching Center).

The extent of the work is limited to the Salt Springs Powerhouse, Penstock tunnel, and Valve house. The PSV control valves and accumulator system, including solenoid valves, are to remain as is. The inputs from the existing valve positions and unit output will remain as is. The extent of the valve house scope involves the addition of a fiber-optic communication cable between its existing SCADA Pack Remote Terminal Unit and the Powerhouse RTU, including the necessary communication equipment to implement this. The powerhouse scope will be limited to the PSV operator interface in the control room, modifications to the powerhouse RTU, and the replacement of a pressure instrument in the penstock pipe floor.

There will be no changes to the existing Low-level Outlet (LLO) or bypass valves, nor the turbine for this work. The piping will remain as is, except for the welded attachments for mounting of the flow and pressure transducers onto the penstock. The hydraulic control valves, and the solenoid valves controlling them, will remain as is.

Justification

CAP Issue 116981780 identified that Penstock B has no protection or monitoring system in place to close the PSVs on Penstock A and B, if there was a Penstock B failure. Installation of the Flow Meter system (like other penstocks in the watershed) supports PG&E's goal of safe and reliable operation of assets by reducing risks in the event of a penstock failure. An undetected penstock failure could lead to erosion under the penstock which may cause an uncontrolled water release that could impact the environment or personnel safety.

PACIFIC GAS AND ELECTRIC COMPANY
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Project Summary

Cost

As of the end of 2024, this project is nearly complete. Only startup and testing remain. Startup and testing are expected to be completed in 2025.

Major Project Spending Estimates
(Thousands of Nominal Dollars)

CAPITAL

Planning Order	Description	Operative Date	2024 CWIP	2025 Forecast	2026 Forecast	2027 Forecast	2028 Forecast	2029 Forecast	2030 Forecast	CWIP + 2025 - '30 Total
5788233	Salt Springs 1 Penstock Excess Flow Prot	December 2025	3,871	47						**3,918**

Benefits

The project does not have intrinsic cost savings but provides benefits in the reliability of the system and prevention of uncontrolled water release that could have a significant impact on general safety of the public and PG&E facilities downstream of the dam. An undetected penstock failure could lead to erosion under the penstock which may cause an uncontrolled water release that could impact the environment or personnel safety in terms of landslides and debris in waterways.

Alternatives Considered

Status Quo: Do nothing - This alternative is not recommended. An undetected penstock failure could lead to erosion under the penstock which may cause an uncontrolled water release that could impact the environment or personnel safety in terms of landslides and debris in waterways.

Alternative 1: Install Penstock Excess Flow Protection - This is the recommended alternative.

Alternative 2: Reschedule one year - This alternative assumes the project is rescheduled by one year. This alternative has the same long-term benefits as the recommended alternative; however, in the short-term, this alternative is not recommended for the same reasons discussed in the status quo.

PACIFIC GAS AND ELECTRIC COMPANY
Chapter 3: Hydro Operations Costs
Project Summary

Project Title: Salt Springs Equipment Life Cycle Replacement
Major Work Categories: 2M, 2P
Planning Order Numbers: 5720513, 5745715, 5779577, 5760722, 5783073
Project Start Date: 2017
Project Completion Date: November 2028
Operative Date (only applies to Capital): December 2030

Project Description

Salt Springs 1 Powerhouse is a one-unit, 11 MW powerhouse located on the Bear River. The Salt Springs 1 Powerhouse produces an average of approximately 33 GWH of electricity per year. The Powerhouse, commissioned in 1931, is comprised of single vertical reaction (Francis) unit coupled with a Westinghouse generator and controlled by a Pelton mechanical governor. Salt Springs 2 powerhouse is a 33 MW unit, fed from Lower Bear River Reservoir on the Bear River.

Salt Springs 2 has been in service since 1953. The Salt Springs 2 produces an average of about 163 GWh of electricity per year and provides 33 MW of capacity to help meet our customers' summertime demand for electricity. In addition, Salt Springs 2 provides ancillary services such as load following and voltage support, thereby increasing the value of this resource to California's electric system.

The Salt Springs Equipment Life Cycle Replacement project will rewind the existing generator at the Salt Springs 1 Powerhouse. This project will also be replacing the existing runner in Salt Springs 2 Powerhouse while the runner is being replaced, a new accumulator and penstock shutoff valve (PSV) controls will be installed to protect the new runner.

The bearing cooling water systems are the original systems put in place when the PH was commissioned. The systems are restricted due to pipe corrosion and accumulated sedimentation and have reached their end of life. This restriction negatively impacts the cooling water flow rate to the bearing oil cooling coils. The restriction has resulted in unit trips and unusually high bearing temperatures. It is recommended to replace the existing piping, coils, valves, instrumentation, and bearings for unit reliability. These projects will need the use of the 50-ton rail crane located inside the powerhouse that will be modernized the year prior to the rewind, runner, bearings, and cooling coils replacement projects.

Justification

The justification for this project is reliability. Rewind of this generator will reduce the risk of failure in service and improve the reliability of power generation. The Westinghouse generator at Salt Springs 1 was last rewound in 1985 by Westinghouse.

The Salt Springs 2 runner replacement will ensure operational reliability by preventing unplanned outages. By upgrading to modern, reliable equipment, the powerhouse will maintain compliance with industry standards, improve cost efficiency, and future-proof its operations for continued safe and efficient performance.

PACIFIC GAS AND ELECTRIC COMPANY
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Project Summary

The Salt Springs PH DS Crane Modernization is needed due to the current crane's outdated technology that hinders efficient operation, resulting in productivity challenges and potential safety hazards. A refurbished crane will enhance operational efficiency, meet safety standards, and support crane-dependent projects effectively.

Cost

The cost assumptions for this project are based on: (a) the professional judgment of the engineers familiar with this type of work; and (b) historic PG&E cost data for similar work.

Major Project Spending Estimates
(Thousands of Nominal Dollars)

CAPITAL

Planning Order	Description	Operative Date	2024 CWIP	2025 Forecast	2026 Forecast	2027 Forecast	2028 Forecast	2029 Forecast	2030 Forecast	CWIP + 2025 - '30 Total
5720513	Salt Springs 1 Rewind Generator	December 2030	119	-	-	-	67	1,682	5,657	**7,524**
5745715	Salt Springs 2 Repl Runner,Needles,Seats	October 2028	676	-	233	951	2,723	256		**4,839**
5760722	Salt Springs 2 Repl Accum & PSV cntrls	October 2028			233	476	3,011	256		**3,976**
5783073	Salt Springs 2 Repl Coils, RTDs, Bearing	November 2028			233	476	2,569	156		**3,434**
5779577	Salt Springs PH Crane Modernization	December 2027	40	-	866	2,144	76			**3,126**

Benefits

- Potential avoidance of higher capital costs for a generator rewind or runner replacement on an expedited basis if the generator windings or runner fails.
- Potential avoidance of future O&M expense cost increases associated with maintaining this aging equipment.
- A higher level of power generation reliability resulting from a reduction in forced outages caused by this aging equipment. This results in replacement power cost savings for customers.

Alternatives Considered

Status Quo: Do nothing – This alternative is not recommended. This alternative assumes that no action is taken other than minimal maintenance until an unplanned runner and/or generator failure. A very long forced outage would occur until new components could be fabricated and installed resulting in additional capital costs for expedited work and excessive customer replacement power costs.

Alternative1: Salt Springs Equipment Life Cycle Replacement –This is the recommended alternative. This alternative results in the potential avoidance of future O&M expense cost increases associated with maintaining this aging equipment and a higher level of power generation reliability resulting from a reduction in

forced outages caused by this aging equipment. This results in replacement power cost savings for customers. This alternative also results in the potential avoidance of higher capital costs for a generator rewind or runner replacement on an expedited basis if the generator windings or runner fails.

Alternative 2: Reschedule One Year – This alternative is not recommended. This alternative assumes the projects are rescheduled for one year. This alternative ultimately has the same long-term benefits as the recommended alternative; however, in the short-term, this alternative is not recommended for the same reasons discussed in the status quo.

PACIFIC GAS AND ELECTRIC COMPANY
Chapter 3: Hydro Operations Costs
Project Summary

Project Title: San Joaquin 3 Ground Grid Mitigation

Major Work Categories: 2L **Planning Order Numbers:** 5810379 **Project Start Date:** 2026
Project Completion Date: 2030
Operative Date (only applies to Capital): August 2030

Project Description

To ensure electrical safety, PG&E's Applied Technology Services performed an evaluation of the existing ground grid at San Joaquin 3 powerhouse. As a result of this evaluation, PG&E identified touch potentials over the allowable limits on the perimeter fence and grounded metallic objects outside the ground grid perimeter. To mitigate this safety hazard the following improvement are being implemented:

1. Operating platforms will be installed at the base of equipment and structures located outside of the ground grid perimeter and in the areas that require employees to stand on the ground while touching metal objects. Areas that will be considered for this mitigation include areas around 70 kV CB 12 and its support structure and areas around Transformer Bank 2.2.
2. The installation of six non-conductive fence panels on perimeter fence 3.
3. Replacement of existing metal handrails with non-conductive railing.
4. Grounding of existing transformer bank 2 fans.
5. Installation of ⅝" x 8'ground rods.

Justification

The primary justification for this project is to reduce the safety risk to personnel working on and around this equipment.

Cost

The cost assumptions for this project are based on the professional judgment of the engineers and hydro operators familiar with this type of work.

Major Project Spending Estimates
(Thousands of Nominal Dollars)

CAPITAL

Planning Order	Description	Operative Date	2024 CWIP	2025 Forecast	2026 Forecast	2027 Forecast	2028 Forecast	2029 Forecast	2030 Forecast	CWIP + 2025 - '30 Total
5810379	San Joaquin 3 - Mitigate Ground Grid	August 2030				119	459	780	2,343	**3,701**

Benefits

Increased safety to personnel working on and around the equipment in question by reducing the hazard of electrical shock.

Alternatives Considered

Status Quo- Do nothing. Not a feasible option, proper grounding is necessary for personal safety.

Alternative 1: Refurbish – Not feasible due to age of equipment.

Alternative 2: Replace (recommended) – Implement the improvements recommended by PG&E's Applied

Technology Services and listed in the Project Description above.

Alternative 3: Reschedule by One Year – This alternative assumes the project is rescheduled by one year. This alternative ultimately has the same long-term benefits as the recommended alternative; however, in the short-term, this alternative is not recommended for the same reasons discussed in status quo.

PACIFIC GAS AND ELECTRIC COMPANY
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Project Summary

Project Title: Sand Bar Dam Seepage Mitigation

Major Work Categories: 2N **Planning Order Numbers:** 5802633 **Project Start Date:** 2022
Project Completion Date: 2033
Operative Date (only applies to Capital): December 2031

Project Description

The Sand Bar Dam Seepage Mitigation project consists of work associated with the replacement of the existing 24-foot-high timber crib rockfill dam with a new concrete gravity dam. The new dam will provide the same storage capacity and operating parameters but will increase reliability and generation at the 90 MW Stanislaus Powerhouse.

Sand Bar Dam on Stanislaus River



Justification

The purpose of this structure is to provide storage and diversion from the Stanislaus River to the Stanislaus power tunnel which then feeds Stanislaus Powerhouse. The existing 1930's Dam leaks excessively, limiting the amount of water that can reach the powerhouse decreasing energy production. Based on historical data, daily flows of 11.3 cubic feet per second (cfs) leak through the dam that would otherwise be diverted into the tunnel and to the powerhouse. That equates to an estimated $665,000 of lost generation revenue per year.

Secondly, the dam structure itself has well outlived its useful lifespan and is at risk of failure. PG&E estimates that a flood event of 20,000 cfs or greater down the Stanislaus River would be enough to cause a failure of the dam.

PACIFIC GAS AND ELECTRIC COMPANY
Chapter 3: Hydro Operations Costs
Project Summary

Cost

The forecast is based on class 5 estimates from third party vendors for engineering and construction as well as comparison from other historical data.

Major Project Spending Estimates
(Thousands of Nominal Dollars)

CAPITAL

Planning Order	Description	Operative Date	2024 CWIP	2025 Forecast	2026 Forecast	2027 Forecast	2028 Forecast	2029 Forecast	2030 Forecast	CWIP + 2025 - '30 Total
5802633	Sand Bar Dam Reduce Leakage	December 2031	497		806	2,066	1,883	3,121	25,000	**33,372**

Benefits

The benefit of this project is less replacement power costs for customers as a result of capturing lost generation that is currently leaking through the dam in the amount of 11.3 cfs of water per day. Another benefit of this project is a reduction in the risk of a dam failure and the resulting environmental damage and public safety risk.

Alternatives Considered

Status Quo: Do Nothing – This alternative is not recommended as it does not result in less replacement power costs for customers or a reduction in the risk of a dam failure and the resulting environmental damage and public safety risk.

Alternative 1: Replace the existing 24-foot-high timber crib rockfill dam with a new concrete gravity dam – This is the recommended alternative. This alternative results in less replacement power costs for customers because of capturing lost generation that is currently leaking through the dam and a reduction in the risk of a dam failure and the resulting environmental damage and public safety risk.

Alternative 2: Repair the existing Dam – This alternative would not adequately address loss generation and risk of a dam failure issue.

Alternative 3: Rebuild with a new rock filled Dam – This alternative is not recommended because the construction method is more expensive and not as robust as a new concrete gravity dam.

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Project Title: Spaulding 1 and 2 (Water Delivery/Public Safety)
Major Work Categories: 2N
Planning Order Numbers: 5809662, 5810198, 5809358, 5809658
Project Start Date: March 2024
Project Completion Date: August 2025
Operative Date (only applies to Capital): June 2025

Project Description

Spaulding 1 PRV A and B Replace Discharge Liner -The Spaulding 1 Powerhouse is a single unit powerhouse with two Penstock Release Valves (PRV) and two corresponding discharge horns ("Horn A" and "Horn B"). These horns are used as energy dissipaters that allow water to bypass the unit itself and flow directly into the Spaulding tunnel. The term horn is used as one end is smaller in diameter than end of the tunnel liner. Water typically discharges either via the turbine and one PRVs or via both PRVs if the unit is not in service. Maximum flow can be up to 1,000CFS, however, operations typically pass 400 CFS through the unit and another 400 CFS through one of the PRVs. The scope of this work is to demolish the existing damaged liner in the horn, excavate back to substantial material, install new cladding and epoxy ground annular space.
Spaulding 2 Emergency Water Delivery- Spaulding 2 is an unmanned powerhouse located below Spaulding 1 Powerhouse. Spaulding 2 was placed out of service in May 2023 due to unit control issues related to the deterioration of wicket gates, linkages, arms, bushings and the shift ring. The specific root cause of the wicket gates failing was a broken hydraulic controller. As a result, the only method to deliver water is via emergency spill from the Drum Canal (YB-244). Utilization of YB-244 is not an acceptable or sustainable mid- or long-term option for continued operation. Use of YB-244 beyond short duration emergency situations creates unacceptable risk to the conveyance facilities upstream of YB 244 and to water delivery obligations to downstream customers. Installation of new wicket gates and components was determined to be the best long-term and reliable solution.

Spaulding 1 Install Training Wall and Columns- The Spaulding 1 Powerhouse is a single unit powerhouse with two PRVs and two corresponding discharge horns ("Horn A" and "Horn B"). Water typically discharges either via the turbine and one PRVs or via both PRVs if the unit is not in service. Maximum flow can be up to 1,000CFS, however, operations typically pass 400 CFS through the unit and another 400 CFS through one of the PRVs. As water discharges, its energy is dissipated by the adjacent training wall and weir before entering the Drum Tunnel. The training wall and support columns were severely damaged and rebuilt in 2024. This project will complete the training wall construction with ¾" steel cladding plus epoxy grout to minimize erosion and extend the serviceable life of the training wall, support columns and native tunnel rock.

Justification

Spaulding 1 PRV Replace Discharge Liner - In March of 2024 existing cladding in Horn A failed requiring the shut-down of Spaulding 1 powerhouse for five months. This project will match what was completed in Horn A with same gage steel in Horn B and epoxy grout of the annular space. These PRVs are needed to meet the contractual water purchasing amounts for Nevada Irrigation District (NID) and Placer County Water Agency (PCWA). Spaulding 1 Powerhouse can only move 400 CFS of water through the unit and an additional 400 CFS of water is passed through the PRVs. The 800 CFS is needed to meet the contractual agreement that PG&E deliver 800 CFS to NID and PCWA during the summer months of May through October for irrigation and personal consumption of their customers.

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Spaulding 2 Powerhouse Emergency Water Delivery- This project is needed for safe operations of Spaulding 1 dam as the powerhouse is used as a bypass or to move water in the event of a high flow event like a storm. The 114 CFS that is moved through Spaulding 2 Powerhouse is calculated into our Dam Safety winter operations to keep the dam from over topping during high inflows of water from a storm which would cause large environmental damage to wildlife habitat in woodland and waterways.

Spaulding 1 Install Training Wall and Columns- Computational Flow Dynamic (CFD) models predict considerable damage to the training wall if it is left un-armored. In addition, FERC commitments were made to clad and anchor the training wall, reducing the risk of any failure to the tailrace downstream assets.

Cost

The cost assumptions for this project are based on professional judgment of the local engineering and hydro team familiar with this type of work.

Major Project Spending Estimates
(Thousands of Nominal Dollars)

CAPITAL

Planning Order	Description	Operative Date	2024 CWIP	2025 Forecast	2026 Forecast	2027 Forecast	2028 Forecast	2029 Forecast	2030 Forecast	CWIP + 2025 - '30 Total
5809358	Spaulding 1 PRV Discharge Liner Rplc	December 2025	-	541						**541**
5809658	Spaulding 2 Repl Wicket Gate and Runner	December 2025	1,515	383						**1,898**
5809662	Spaulding 1 Tunnel Instl Training Wall	December 2025	1,946	4,000						**5,946**
5810198	Spaulding 1 PRV B Discharge Liner Rplc	December 2025	495	23,828						**24,322**

Benefits

Spaulding 1 PRV Replace Discharge Liner - Completion of this work will allow PG&E to meet water delivery obligations. A higher level of power generation reliability will also result from a reduction in forced outages caused by this aging equipment. This results in replacement power cost savings for customers.

Spaulding 2 Emergency Water Delivery- Allows PG&E to meet its water delivery obligation. Allows PG&E to operate Spaulding 2 PH resulting in replacement power cost savings for customers. Mitigates the risk of overtopping the dam resulting in an uncontrolled water release.

Spaulding 1 Install Training Wall and Columns- Completion of this work will ensure the integrity of the training wall and support columns reducing the risk of potential damage to the Drum Tunnel headworks and downstream assets. This work allows PG&E to continue to generate power for its customers and meet its water delivery obligations. This work will fulfill a commitment made to FERC.

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Alternatives Considered

Spaulding 1 PRV Replace Discharge Liner

Status Quo: Do nothing – This alternative is not recommended. This alternative would result in the inability to meet water delivery obligations and would also lead to forced outages resulting in replacement power costs for customers.

Alternative 1: Replace Discharge Liner – This is the recommended alternative. Completion of this work will allow PG&E to meet water delivery obligations. Also, a higher level of power generation reliability will result from a reduction in forced outages caused by this aging equipment. This results in replacement power cost savings for customers.

Alternative 2: Install new steel tunnel liner - This alternative is not recommended. A new steel tunnel liner would allow discharged water to cause structural damage to the powerhouse tunnel that could cause a collapse.

Alternative 3: Install a bypass tunnel - This alternative is not recommended. A bypass tunnel from the reservoir to the South Yuba canal would be very costly and would take years of design, permitting, and construction. A quicker and less costly option is preferred.

Alternative 4: Reschedule to future outage - This alternative is not recommended. This alternative does not allow PG&E to meet its water delivery obligations in a timely manner. Also, the risk of construction and weather delays would further impact the water delivery obligations.

Spaulding 2 Emergency Water Delivery

Status Quo: Do nothing – This alternative is not recommended. The powerhouse cannot safely pass enough water in the current state to meet water delivery obligations. Also, this alternative does not allow PG&E to operate Spaulding 2 PH resulting in replacement power costs for customers. This alternative does not mitigate the risk of overtopping the dam resulting in an uncontrolled water release.

Alternative 1: Install new wicket gates and components – This is the recommended alternative as it restores PG&E's ability to meet its water delivery obligations; allows PG&E to operate Spaulding 2 PH resulting in replacement power cost savings for customers; and mitigates the risk of overtopping the dam resulting in an uncontrolled water release.

Alternative 2: Reschedule to future outage - This alternative is not recommended. This alternative would result in the inability to meet water delivery obligations in a timely manner. Also, this alternative does not allow PG&E to operate Spaulding 2 PH resulting in replacement power costs for customers and does not mitigate the risk of overtopping the dam resulting in an uncontrolled water release.

Spaulding 1 Install Training Wall and Columns

Status Quo: Do nothing – This alternative is not recommended. The powerhouse cannot safely pass enough water in the current state to meet water delivery obligations. Not armoring the training wall would violate the FERC recommendation and commitment and would not ensure the integrity of the training wall and support columns putting the powerhouse at risk of continuing to generate power for its.

Alternative 1: Install Training Wall and Columns – This is the recommended alternative. Completion of this

work will ensure the integrity of the training wall and support columns reducing the risk of potential damage to the Drum Tunnel headworks and downstream assets. This work allows PG&E to continue to generate power for its customers and meet its water delivery obligations. This work will fulfill a commitment made to FERC.

Alternative 2: Reschedule to future outage - This alternative is not recommended. This alternative would result in the inability to meet water delivery obligations in a timely manner. Also, the risk of construction and weather delays would further impact on the water delivery obligations and PG&E's commitment to FERC.

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Project Summary

Project Title: Spaulding 1 TSV Refurbishment

Major Work Categories: 2M **Planning Order Numbers:** 5760154 **Project Start Date:** June 2020
Project Completion Date: October 2029
Operative Date (only applies to Capital): August 2029

Project Description

Lake Spaulding rests at an elevation of 5,014 feet in a glacier carved bowl of granite. The lake has a surface area of 698 acres with a capacity of 74,773-acre feet and is surrounded by giant rocks and a thick pine forest. The lake was originally built for hydraulic mining in 1912 but is used for water storage and recreation today. This project will refurbish the Spaulding 1 Turbine Shutoff Valve (TSV) to a condition adequate to shut off water flow and provide a safe lock out tag out (LOTO or clearance) point for work to be performed downstream.

Justification

The TSV currently leaks excessively. This causes a safety hazard for work to be performed downstream of the TSV such as work on the turbine runner. Currently, clearances are managed by closing the intake at the dam and draining the pipe all the way to the turbine. This approach requires the use of a spotter while annual turbine inspections are done. In addition, excess water must be diverted from the pipe to a drainage system in the powerhouse.

Cost

The cost assumptions for this project are based on: (a) the professional judgment of the engineers familiar with this type of work; and (b) historic PG&E cost data for similar work.

Major Project Spending Estimates
(Thousands of Nominal Dollars)

CAPITAL

Planning Order	Description	Operative Date	2024 CWIP	2025 Forecast	2026 Forecast	2027 Forecast	2028 Forecast	2029 Forecast	2030 Forecast	CWIP + 2025 - '30 Total
5760154	Spaulding 1 TSV Refurbishment	October 2028	136	-	449	728	3,929	204		**5,445**

Benefits

- Potential avoidance of future O&M expense cost increases associated with maintaining this aging equipment.
- A higher level of power generation reliability resulting from a reduction in outage time during turbine inspections. This results in a replacement power cost savings for customers.

Alternatives Considered

Status Quo: Do nothing - This alternative is not recommended. The current approach for managing the clearance for turbine work is time consuming and labor intensive. This results in O&M expense cost increases associated with maintaining this aging equipment. The addition time to close and tag the intake at the dam and draining the pipe all the way to the turbine results in additional outage time and replacement power costs for customers.

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Alternative1: Refurbish the existing TSV – This is the recommended alternative. This alternative avoids future O&M expense cost increases associated with maintaining this aging equipment and a higher level of power generation reliability resulting from a reduction in outage time during turbine inspections. This results in a replacement power cost savings for customers.

Alternative 2: Install new TSV – This alternative is not recommended. Although this alternative results in the same benefits as the recommended alternative, the cost of this alternative is much higher than the recommended alternative and the amount of outage time to implement this alternative is longer than the recommended alternative resulting in higher replacement power costs for customers.

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Project Summary

Project Title: Spring Gap Generator Rewind

Major Work Categories: 2M **Planning Order Numbers:** 5778054 **Project Start Date:** 2018
Project Completion Date: 2029
Operative Date (only applies to Capital): 2028

Project Description

Spring Gap Powerhouse is a one-unit, 7 MW powerhouse adjacent to the Middle Fork of the Stanislaus River. The Spring Gap Powerhouse produces an average of approximately 39 GWH of electricity per year.The Spring Gap Generator Rewind project will rewind the existing generator at the Spring Gap Powerhouse.

Justification

A rewind of this generator will reduce the risk of failure in service and improve the reliability of power generation. Spring Gap's generator was last rewound in 1981 by Westinghouse, and it has reached the end of its useful life. If the generator winding fails, the powerhouse will be forced out of service. This powerhouse provides a direct benefit to customers. If the distribution line to Strawberry, California, is out of service or the transmission line to Spring Gap Substation is out of service, then the only alternate source of power to Strawberry, California, is the Spring Gap Powerhouse. Under these circumstances, this powerhouse is providing power to customers without any other source available due to transmission Spring Gap Powerhouse is needed to online for customer support. As the equipment ages, it requires additional maintenance funded by expense and increases the risk of an unplanned outage, reducing power generation reliability.

Cost

The cost assumptions for this project are based on: (a) the professional judgment of the engineers familiar with this type of work; and (b) historic PG&E cost data for similar work.

Major Project Spending Estimates
(Thousands of Nominal Dollars)

CAPITAL

Planning Order	Description	Operative Date	2024 CWIP	2025 Forecast	2026 Forecast	2027 Forecast	2028 Forecast	2029 Forecast	2030 Forecast	CWIP + 2025 - '30 Total
5778054	Spring Gap PH - Generator Rewind	December 2028	279	-	56	1,814	4,628	180	65	**7,024**

Benefits

- Potential avoidance of higher capital costs for a rewind on an expedited basis if the generator windings fail.
- A higher level of power generation reliability resulting from a reduction in forced outages caused by this aging equipment. This results in replacement power cost savings for customers.
- Eliminates the risk of customer outages if curtain conditions are met.

Alternatives Considered

Status Quo (Do Nothing) - This alternative is not recommended. This alternative proposes PG&E does nothing. Running the generator until it fails would result in a prolonged forced outage (a minimum of two years) and higher costs to rewind the generator on an expedited basis. This alternative results in the risk of a significant forced outage caused by this aging equipment resulting in replacement power costs for customers and the potential for customer outages.

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Alternative1: Complete Generator Rewind –This is the recommended alternative. This alternative results in the potential avoidance of higher capital costs for a rewind on an expedited basis if the generator windings fail. Benefits also include a higher level of power generation reliability resulting from a reduction in forced outages caused by this aging equipment. This results in replacement power cost savings for customers. This alternative also eliminates the risk of customer outages if curtain conditions are met.

Alternative 2: Reschedule One Year – This alternative is not recommended. This alternative assumes the project is rescheduled by one year. This alternative ultimately has the same long-term benefits as the recommended alternative; however, in the short-term, this alternative is not recommended for the same reasons discussed in the status quo.

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Project Summary

Project Title: Stanislaus Refurbish TWD #1
Major Work Categories: 2M **Planning Order Numbers:** 5793576 **Project Start Date:** 2023
Project Completion Date: 2030
Operative Date (only applies to Capital): December 2029

Project Description
This project proposes to refurbish the Tailwater Depression (TWD) system blower and motor of tail-water depression unit #1, install new control panel, and replace various protective devices and alarming switches to operate the Stanislaus, 91 MW unit, safely and reliably under high tailwater conditions.

Justification
Stanislaus powerhouse is equipped with a TWD system for the depression of water level in the turbine wheel pit to permit operation of the generating unit during periods of high tailwater. The TWD system is comprised of three (3) separate blower units, operated as lead-lag-spare. The system was originally installed between the years 1987 and 1991, and with over 30 years of operation, the equipment is aged and has become an increasing reliability concern. The control system hardware is also obsolete with limited availability of spare parts. Throughout the past, start/stop control of each blower has been done manually and without accurate detection of tailrace water level to govern the controls. The condition if the TWD Unit #1 is continuing to deteriorate and there is a risk of equipment failure during operation resulting in loss of generation and a potential forced outage.

Cost
The cost assumptions for this project are based on professional judgment and historic PG&E cost data for similar work.

Major Project Spending Estimates
(Thousands of Nominal Dollars)

CAPITAL

Planning Order	Description	Operative Date	2024 CWIP	2025 Forecast	2026 Forecast	2027 Forecast	2028 Forecast	2029 Forecast	2030 Forecast	CWIP + 2025 - '30 Total
5793576	Stanislaus Refurbish TWD 1	December 2029	130	357	237	712	237	1,992	51	**3,716**

Benefits
The units have exceeded their reliable, 30-year service life, and are showing signs of degradation and need to be replaced and/or refurbished for the powerhouse to continue to operate under high tailwater conditions. Benefits include the potential avoidance of future O&M expense cost increases associated with maintaining this aging equipment and a higher level of power generation reliability resulting from a reduction in forced outages caused by this aging equipment. This results in replacement power cost savings for customers.

Alternatives Considered
Status Quo: Do nothing – Not a feasible option. This alternative results in an increase in future O&M expense costs associated with maintaining this aging equipment and a reduction in power generation reliability resulting from an increase in forced outages caused by this aging equipment. The reduction in reliability leads to an increase in replacement power costs for customers. Alternative 1: Refurbish Stanislaus TWD #1 – This

alternative is not feasible due to the age and condition of the equipment.

Alternative 2: Replace Stanislaus TWD #1 – This is the recommended alternative since it reduces the likelihood of future O&M expense cost increases associated with maintaining this aging equipment and a result in a higher level of power generation reliability resulting from a reduction in forced outages caused by this aging equipment. This results in replacement power cost savings for customers.

Alternative 3: Replace Stanislaus TWD #1 but defer by one year – This alternative assumes the project is rescheduled by one year. This alternative has the same long-term benefits as the recommended alternative; however, in the short-term, this alternative is not recommended for the same reasons discussed in the status quo.

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Project Summary

Project Title: Stanislaus Replace Bearings, Cooling Coils and Install Monitoring
Major Work Categories: 2M **Planning Order Numbers:** 5793621 **Project Start Date:** October 2022 **Project Completion Date:** 2031
Operative Date (only applies to Capital): December 2031

Project Description

The Stanislaus Powerhouse (PH) is located on the Stanislaus River, Tuolumne County, approximately 11 miles flying distance north of Sonora and approximately 5 miles east of Murphys. The powerhouse was commissioned in 1962 and replaced the old powerhouse which had been in operation since 1908. The powerhouse contains one vertical shaft, a six-jet impulse turbine directly connected to a 91,000 kVA synchronous generator. The upper generator guide bearing (UGGB), lower generator guide bearing (LGGB), generator thrust bearing (GTB), and the turbine guide bearing (TGB) are self-lubricating. The bearing oil pots are filled and drained through pipes extended to a convenient location in the basement. The bearing oil is cooled by means of water coils located in the bearing tubs.

A GTB/UGGB cooling coil failure was experienced at Stanislaus PH in January 2021. The powerhouse was forced out of service due to the suspected leak in the GTB cooling coil. The plant was forced offline, and an emergency project was initiated to investigate the cooling coil condition. Upon inspection, cracks were found in the existing cooling coil.

This project includes the following:

- Replacement of three cooling coils for the LGGB, GTB, and TGB;
- Full unit alignment due to new thrust shoe installation;
- Installation of new Resistance Temperature Devices (RTDs); and
- Installation of new state-of-the art bearing vibration monitoring equipment.

Justification

Given the vintage of these cooling coils and the failure rate that was seen in the GTB cooler, it is recommended to replace all three bearing cooling coils with new coils. Additionally, the in-service UGGB and GTB shoes and shells were inspected and evaluated during the January 2021 outage. Per the as-found measurements and conditions of the bearings, it is recommended a full set of bearings be replaced during 2022 outage while the unit is apart.

In addition, the existing bearing temperature devices are nearing the end of useful service life. This project proposes to install new remote temperature devices (RTDs). Similarly, vibration data is not recorded regularly and requires mobilizing testing personnel and temporary setup, which is less than optimal. It is recommended to install new state-of-the-art bearing vibration detection equipment. The installation of remote temperature devices/vibration monitoring system will monitor bearings temperature & vibration and report the readings to the fleet recording data module.

Cost

The cost assumptions for this project are based on professional judgment of the local engineering and hydro team familiar with this type of work.

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Project Summary

Major Project Spending Estimates
(Thousands of Nominal Dollars)

CAPITAL

Planning Order	Description	Operative Date	2024 CWIP	2025 Forecast	2026 Forecast	2027 Forecast	2028 Forecast	2029 Forecast	2030 Forecast	CWIP + 2025 - '30 Total
5793621	Bearing & Cooling Coil; Instl Mntr'g	December 2031	6,264							**6,264**

Benefits

- Potential avoidance of future O&M expense cost increases associated with maintaining this aging equipment.
- A higher level of power generation reliability resulting from a reduction in forced outages caused by this aging equipment. This results in replacement power cost savings for customers.

Alternatives Considered

Status Quo – Do nothing – This alternative is not recommended. This alternative assumes that no action is taken other than minimal maintenance until an unplanned turbine or cooling coil failure. A very long forced outage would occur until new components could be fabricated and installed resulting in additional costs for expedited work and excessive customer replacement power costs.

Alternative1: Complete Reliability Projects –This is the recommended alternative. This alternative results in the potential avoidance of future O&M expense cost increases associated with maintaining this aging equipment and a higher level of power generation reliability resulting from a reduction in forced outages caused by this aging equipment. This results in replacement power cost savings for customers.

Alternative 2: Reschedule One Year – This alternative is not recommended. This alternative assumes the projects are rescheduled for one year. This alternative ultimately has the same long-term benefits as the recommended alternative; however, in the short-term, this alternative is not recommended for the same reasons discussed in the status quo.

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Project Summary

Project Title: Tiger Creek Equipment Life Cycle Replacement
Major Work Categories: 2M
Planning Order Numbers: 5766241, 5778900
Project Start Date: March 2024
Project Completion Date: December 2027
Operative Date (only applies to Capital): June 2027

Project Description

Tiger Creek is a two-unit, 58 MW powerhouse located on the Mokelumne River near Pioneer, California. The Tiger Creek Powerhouse produces an average of approximately 307 GWh of electricity per year. The Powerhouse is comprised of two Pelton horizontal, double overhung single-nozzle turbines coupled with Westinghouse generators.

This purpose of the project is to rewind the Unit 2 (U2) generator stator and refurbish the rotor field poles to restore generator reliability. Also included is the replacement of the existing U2 rotating exciter system with a Basler DECS-450 full static excitation system like its sister unit, Unit 1. This scope of work will also include removal of the existing shaft mounted exciter.

Justification

The justification for this project is reliability. A rewind of the generator will reduce the risk of failure in service and improve the reliability of power generation. Tiger Creek U2 was last rewound in 1992 by Westinghouse. This is a NERC-compliant unit and is subject to fines if the exciter cannot maintain the voltage within regulation limits. It is recommended to replace the U2 exciter with a new static exciter like U1. This project will restore system reliability, avoid adverse generation impacts due to untimely and extended outages, and avert additional material and installation costs due to expediting repairs.

Cost

The cost assumptions for this project are based on: (a) the professional judgment of the engineers familiar with this type of work; and (b) historic PG&E cost data for similar work.

Major Project Spending Estimates
(Thousands of Nominal Dollars)

CAPITAL

Planning Order	Description	Operative Date	2024 CWIP	2025 Forecast	2026 Forecast	2027 Forecast	2028 Forecast	2029 Forecast	2030 Forecast	CWIP + 2025 - '30 Total
5766241	Tiger Creek U2 Exciter Replacement	March 2026	766	2,138	422					**3,326**
5778900	Tiger Creek U2 Rewind	October 2027	2,440	-	1,738	4,384				**8,562**

Benefits

- Potential avoidance of higher capital costs for a rewind or exciter replacement on an expedited basis if the generator windings or exciter fails.
- A higher level of power generation reliability resulting from a reduction in forced outages caused by this aging equipment. This results in replacement power cost savings for customers.

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Alternatives Considered

Status Quo: Do Nothing – This alternative is not recommended. Running the generator until it fails would result in a prolonged forced outage (a minimum of two years). This results in replacement power costs for customers. This alternative also results in higher capital costs to rewind the generator stator, refurbish the rotor field poles, or replace the exciter on an expedited basis.

Alternative1: Complete Reliability Projects –This is the recommended alternative. This alternative results in the potential avoidance of higher capital costs for a rewind or exciter replacement on an expedited basis if the generator windings or exciter fails. This alternative also results in a higher level of power generation reliability resulting from a reduction in forced outages caused by this aging equipment. This results in replacement power cost savings for customers.

Alternative 2: Reschedule One Year – This alternative is not recommended. This alternative assumes the projects are rescheduled for one year. This alternative ultimately has the same long-term benefits as the recommended alternative; however, in the short-term, this alternative is not recommended for the same reasons discussed in the status quo.

PACIFIC GAS AND ELECTRIC COMPANY
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Project Summary

Project Title: Tiger Creek PH Crane Modernization

Major Work Categories: 2P **Planning Order Numbers:** 5779576 **Project Start Date:** January 2025
Project Completion Date: November 2026
Operative Date: March 2026

Project Description

Tiger Creek is a two-unit, 58 MW powerhouse located on the Mokelumne River near Pioneer, California. The Tiger Creek Powerhouse produces an average of approximately 307 GWh of electricity per year. The Powerhouse is comprised of two Pelton horizontal, double overhung single-nozzle turbines coupled with Westinghouse generators.
These enhancements will enable operators to safely monitor and manage crane movements while addressing existing limitations in load handling. Modernization includes installing crane limits to prevent the spool from unwinding, mitigating significant safety risks to personnel. The refurbishment will align the crane with desired operating conditions to support critical powerhouse projects that depend on reliable crane operations in which the crane will be needed to lift large and heavy components of the unit for maintenance or replacement of internal parts.

Justification

The current crane's outdated technology hinders efficient operation, resulting in productivity challenges and potential safety hazards. A refurbished crane will enhance operational efficiency, meet safety standards, and support crane-dependent projects effectively. Deferring this project could lead to continued inefficiencies and increased safety risks, including potential hazards from unwinding spools.
The recommended refurbishment approach balances cost-effectiveness with achieving project objectives, making it a more practical alternative compared to complete replacement.
Modernizing the crane will ensure reliability and long-term usability while addressing safety concerns and improving project workflows.

Cost

The cost assumptions for these projects are based on:(a) the professional judgment of the engineers familiar with this type of work; and (b) historic PG&E cost data for similar work.

Major Project Spending Estimates
(Thousands of Nominal Dollars)

CAPITAL

Planning Order	Description	Operative Date	2024 CWIP	2025 Forecast	2026 Forecast	2027 Forecast	2028 Forecast	2029 Forecast	2030 Forecast	CWIP + 2025 - '30 Total
5779576	Tiger Creek PH Crane Modernization	March 2026	257	3,138	454					**3,850**

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Benefits

- Potential avoidance of future O&M expense cost increases associated with maintaining this aging equipment.
- A higher level of power generation reliability resulting from a reduction in forced outages caused by this aging equipment. This results in replacement power cost savings for customers.
- Increased productivity for crane-dependent projects.
- By incorporating modern control systems and mechanical upgrades, the project ensures compliance with current safety standards while extending the crane's lifespan.

Alternatives Considered

Status Quo- Do nothing – This alternative is not recommended. Attempting to maintain the existing crane will result in future O&M expense cost increases associated with maintaining this aging equipment; an increase in forced outages resulting in replacement power costs to customers; safety risks; and no improvement in productivity for crane-dependent projects.

Alternative 1: Replacement- This alternative is not recommended. While replacing the crane has the same benefits as the proposed project, it is less cost-effective due to the higher capital costs.

Alternative 2: Refurbishment- This alternative is the recommended solution as it realizes all the above benefits at the lowest capital cost.

Alternative 3: Repair- This alternative is not recommended. This alternative is essentially the same as the status quo alternative.

Alternative 4: Retirement- This alternative is not recommended. The crane is required to continue to maintain the powerhouse. This alternative would lead to the shutdown of the powerhouse because PG&E would no longer be able to maintain it. This alternative would not be in the best interests of the customer.

PACIFIC GAS AND ELECTRIC COMPANY
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Project Summary

Project Title: Turbine Runner Maintenance/Welding
Major Work Categories: KH **Planning Order Numbers:** 5287177 **Project Start Date:** 2027
Project Completion Date: 2032
Operative Date (only applies to Capital): Expense – n.a.

Project Description

The Hydro turbine/runner program work focuses on aged and deteriorated equipment that is exhibiting lower generation efficiency and higher maintenance requirements due to out-of-date hydraulic design, older, weaker, and more corrosion prone material, and loss of the original hydraulic profile designed to produce maximum power with the least amount of water.

The program follows typical industry practice of renewing equipment when its continued operation is determined to be less reliable, less economical, or higher risk than new equipment would be. Problems associated with the wear of the turbine and its supporting equipment include more frequent repairs that cost more, less power output, increased leakage internally and externally, and greater probability of forced outages. Excessive wicket gate or nozzle leakage can and has resulted in problems stopping the turbines from spinning when shut down, requiring the closure of safety-oriented valves upstream. It also creates problems when attempting to synchronize to the grid as poor speed control makes it difficult to match the turbine/generator speed to the grid.

PG&E has been repairing this equipment over time in a manner that focused on the worst condition equipment and the equipment with the most potential for generating more power. The continuation of the practice will allow the upgraded hydro turbines to continue operating reliably and efficiently for another 40 years or more.

Justification

This project is an expense project to maintain safe operation and reliability of the hydro turbines throughout the PG&E fleet. Cyclic loading created by current energy demands of the grid have increased the frequency that turbine damage occurs. Turbine damage includes but is not limited to cavitation damage, erosion damage, fatigue damage, and foreign object impact damage. These repairs restore the turbines hydraulic profiles and material strength. Without these repairs the turbines will degrade to the point where they may become unsafe to operate or will trip offline due to rotational imbalances.

Cost

The cost assumptions for these projects are based on the professional judgment of the engineers and licensing professionals familiar with this type of work and historic PG&E cost data for similar work.

Major Project Spending Estimates
(Thousands of Nominal Dollars)

EXPENSE

Planning Order	Description	2025 Forecast	2026 Forecast	2027 Forecast	2025-2027 Forecast
5287177	Turbine Runner Maintenance/Welding			1,500	**1,500**

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Benefits

- Potential avoidance of excessive capital costs for a turbine runner replacement on an expedited basis if the turbine runner fails as a result of not doing this work.
- Potential avoidance of future O&M expense cost increases associated with maintaining this aging equipment.
- A higher level of power generation reliability resulting from a reduction in forced outages caused by this aging equipment. This results in replacement power cost savings for customers.

Alternatives Considered

Status Quo – Do Nothing - This alternative assumes that no action is taken other than minimal maintenance until unplanned turbine failure. A very long forced outage would occur until a new turbine runner could be fabricated and installed resulting in additional costs for expedited work and replacement power.

Alternative 1: Turbine Runner Maintenance/Welding – This is the recommended alternative. This alternative may avoid the need for excessive capital costs for a turbine runner replacement on an expedited basis if the turbine runner fails as a result of not doing this work. This alternative also may avoid future O&M expense cost increases associated with maintaining this aging equipment. Also, this alternative results in a higher level of power generation reliability resulting in replacement power cost savings for customers.

Alternative 2: Reschedule One Year –This alternative is not preferred as the existing damage will grow exponentially over time, resulting in more extensive repairs and more cost. Also, a very long forced outage could occur until a new turbine runner could be fabricated and installed resulting in additional costs for expedited work and replacement power.

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Project Title: Upper North Fork Feather River Relicensing and License Conditions
Major Work Categories: 3H, IG
Planning Order Numbers: 5236367, 5236368, 5802888, 5812226, 5812227
Project Start Date: 1999
Project Completion Date: 2031
Operative Date (only applies to Capital): 5802888 – October 2028, 5812226 – December 2030, 5812227 - August 2029

Project Description

The Upper North Fork Feather River (UNFFR) Project includes 5 powerhouses located in the upper reaches of the North Fork Feather River. The UNFFR powerhouses produce an average of about 1,154 GWh of electricity per year.

The long-term FERC license for the UNFFR Project expired in 2004. The Federal Energy Regulatory Commission (FERC) has issued annual licenses since then and will continue to do so provided the Company continues to relicense the Project. PG&E has been in the relicensing process for the UNFFR since 1999. The forecast cost includes the work necessary to complete the relicensing process and to implement the anticipated license conditions in the new license.

License implementation will begin when the new License is issued by FERC, and is expected to include:

- Building campgrounds, boat launch, day use areas, trails, scenic overlook, and access points.
- Constructing improved flow release facilities at Canyon Dam Outlet Tower and Belden Forebay Dam.
- Removing Caribou Camp swimming pool and tennis court; and
- Installing new road signs on Butt Valley Caribou Roads.
- In addition to the above capital improvements, PG&E expects to be required to do the following:
- Pay the Forest Service for recreation improvements.
- Maintain various rest stops, trails, boat launch, water access, day use areas, and campgrounds.
- File project boundary drawings to include all recreation improvements.
- Make various license required recurring payments to the Forest Service and CA Department of Fish and Game.
- Develop and implement plans for the management of roads and traffic, vegetation, cultural resources, invasive weeds, and bald eagles; and
- Develop, and implement plans for water quality.

Justification

Under the Federal Power Act (FPA), the owner of a hydropower project must obtain a license from FERC to operate its project. At the end of the license term, a licensee may apply to relicense its project. The FPA and FERC's implementing regulations specify a comprehensive and rigorous process a licensee must complete to successfully renew its license. The minimum 5-year regulatory process, which often takes substantially longer to complete, includes extensive stakeholder involvement, performance of comprehensive resource studies and balancing of complex societal and environmental issues. Licensees must be highly engaged with stakeholders and plan relicensing activities prior to the relicensing process beginning with filing of a Notice of Intent and Pre-Application Document and must continue relicensing activities through filing the License Application and subsequent environmental review processes leading to issuance of the new license by FERC. The schedule for issuance of a new license is generally uncertain and can take decades.

New FERC license conditions are uncertain until the new license order has been issued by FERC; however, the licensee's cost forecasts (capital and expense) for compliance with anticipated new license requirements

are based on engagement with regulatory agencies and stakeholders during the relicensing proceeding, various environmental reviews (NEPA and CEQA) and regulatory processes and intermediate steps. Cost estimates to implement new license requirements are refined by the licensee throughout the relicensing process based on growing availability of information as the regulatory proceeding matures. Due to many layers of regulatory processes, the schedule for FERC's issuance of a new License can be uncertain and subject to regulatory and agency activities beyond the licensee's control.

The UNFFR FERC 2105 relicensing and new license conditions work was also forecast in previous GRCs. Relicensing work has begun, but the projects have later forecast operative dates because the expected license issuance date is now November 2025. In the previous GRCs, the expected license issuance date was much earlier. A licensee cannot always accurately forecast the scope and costs of license implementation because the measures that will be required are not known in advance and often take years of study of potential impacts before new operating conditions can be specified. This is why PG&E has requested, and the Commission has approved that this work be subject to balancing account treatment.

Cost

The new FERC License Conditions are uncertain until the license is issued by FERC; however, the cost forecasts are based study results and discussions held with the regulatory agencies and stakeholders throughout the relicensing process, and on the Company's experience with implementing recent similar License conditions.

Major Project Spending Estimates

(Thousands of Nominal Dollars)

CAPITAL

Planning Order	Description	Operative Date	2024 CWIP	2025 Forecast	2026 Forecast	2027 Forecast	2028 Forecast	2029 Forecast	2030 Forecast	CWIP + 2025 - '30 Total
5802888	UNFFR LC#Last Chance CG Upgr & Rec Plan	October 2028			251	1,355	1,500	36		**3,142**
5812226	UNFFR LC Eastshore DUA Area Upgr	December 2030				83	667	471	7,498	**8,718**
5812227	UNFFR LC N.Shore Public Boat Launch Upgr	August 2029				147	726	4,489	103	**5,466**

EXPENSE

Planning Order	Description	2025 Forecast	2026 Forecast	2027 Forecast	2025-2027 Forecast	
5236367	UNFFR LC-Bio Mon Spec			1,200	**1,200**	
5236368	UNFFR LC-Bio Mon Stand				1,291	**1,291**

Benefits

The benefit of this project is to obtain a new FERC license for the UNFFR Project so that PG&E can continue to operate these powerhouses to benefit customers and the general public.

Alternatives Considered

Status Quo: Do nothing - This alternative is not recommended. Under this alternative, PG&E would simply abandon the FERC licensing process that has already begun. The result of which would be PG&E's current FERC license not being renewed, and PG&E would not be able to continue operating the UNFFR Project powerhouses. If PG&E would choose to continue to operate, exorbitant fines from FERC would be incurred

and potentially risking PG&E's good standing with FERC.

Alternative 1: Continue to license the UNFFR Project and plan to implement the license conditions – This is the recommended alternative. Under this alternative, PG&E customers and the general public would continue to receive all the benefits of the UNFFR Project.

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Project Title: Vegetation Management Balancing Account (VMBA)
Major Work Categories: IG **Planning Order Numbers:** 5272652 **Project Start Date:** 2020
Project Completion Date: 2030
Operative Date (only applies to Capital): Expense – n.a.

Project Description

The purpose of this program is to identify, inventory, track and abate drought and beetle impacted related tree mortality around and adjacent to hydro assets. The management of dead/dying trees include contractor support, and miscellaneous environmental reviews. PG&E utilizes tree and vegetation management firms to assist with inventorying and removing dead/dying trees. The program is also for the inspections of facilities, identification of associated hazard trees, environmental reviews, permitting, agency interaction, removal and cleanup of the identified trees. A summary of many of the assets include conveyance, dams, access roads, campgrounds, powerhouses, housing, shorelines, landing zones etc. PG&E uses forestry and vegetation management firms to assist with identification, inventory and removal/cleanup of said trees.

Justification

PG&E is responsible for inventorying and removing dead/dying trees adjacent to hydro infrastructure (dams, penstocks, canals, roads, etc.) to reduce the risk of public and worker safety, damage to facilities, and potential tree caused forced outages. The increased tree mortality is due to drought conditions across the state where trees become stressed and are susceptible to bark beetle attacks.
This work is required by FERC licenses, Public Resources Code 4291, and compliance with ISO-55000. The project is imperative for reducing risk and improving reliability to facilities by limiting damage to facilities and tree caused outages. The project provides for safe operations and safety to the public and employees by removal of dead and dying trees. The program removes the higher ignition risk dead trees and as provides for the cleanup up of downed fuels that provide for a higher ground ignition risk in publicly accessible areas such as campgrounds, roads, housing etc. This aligns with PG&E's "Catastrophic wildfires shall stop".

Work is required on an annual basis and incremental benefits are not relevant as new trees are identified annually and not quantifiable in the long term at this time.

Cost

The cost assumptions for this project are based on the professional judgment of the engineers and licensing professionals familiar with this type of work and historic PG&E cost data for similar work.

Major Project Spending Estimates
(Thousands of Nominal Dollars)

EXPENSE

Planning Order	Description	2025 Forecast	2026 Forecast	2027 Forecast	2025-2027 Forecast
5272652	Power Gen Tree Mortality (VMBA)	1,400	1,000	3,000	**5,400**

Benefits

This project mitigates the safety hazard associated with these dead/dying trees. In addition, by reducing the likelihood that dead/dying trees fall into and damage hydro infrastructure, a higher level of power generation reliability resulting from a reduction in forced outages is realized. This results in a replacement power cost

savings for customers.

Alternatives Considered

Status Quo: Do Nothing – This alternative is not recommended. Failure to mitigate the safety hazard associated with these dead/dying trees is not acceptable. This alternative results in the potential for dead/dying trees falling into and damaging hydro infrastructure resulting in forced outages and the resulting replacement power costs for customers.

Alternative 1: Vegetation Management – This alternative is recommended. It results in the mitigation of the safety hazard associated with these dead/dying trees. In addition, by reducing the likelihood that dead/dying trees falling into and damaging hydro infrastructure, a higher level of power generation reliability resulting from a reduction in forced outages is realized. This results in a replacement power cost savings for customers.

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Project Summary

Project Title: West Point Equipment Life Cycle Replacement
Major Work Categories: 2M
Planning Order Numbers: 5802630, 5802629, 5802631, 5792369
Project Start Date: Various
Project Completion Date: Various
Operative Date (only applies to Capital): Various; see table below

Project Description

West Point Powerhouse is a one-unit, 14 MW powerhouse located on the Mokelumne River. The powerhouse, commissioned in 1931, is comprised of single vertical reaction (Francis) unit coupled with a Westinghouse generator and controlled by a Pelton mechanical governor.

The West Point Rewind Generator project will rewind the existing generator at the West Point Powerhouse.

The Generator Relays project will upgrade the West Point Powerhouse existing generator protection scheme to the latest generator protection design standards which utilize micro-processor relays to provide faster performance and reliability.

The Generator Instrumentation Project will install Radio Transmitter Devices (RTD) in the bearing shells and thrust shoes and replace the vibration monitoring devices. The enhanced monitoring provided by the new system will aid in the unit's startup and minimize the risk of a potential bearing wipe. In addition, a new Allen Bradley Compact Logix Programmable Logic Controller (PLC), an auxiliary instrumentation PLC, new oil level devices, and new vibration monitoring devices will be installed. These upgrades aim to enhance the accuracy of monitoring and trending unit health.

The West Point Powerhouse Exciter and associated components will be replaced due to the unavailability of key parts for the existing exciter, such as the Alf and Vegard's RISC board (AVR), firing board, rectifier bridge, overexcitation relay, undervoltage relay, and contactors, which are now obsolete.

Justification

The rewind of this generator will reduce the risk of failure in service and improve the reliability of power generation.
The existing generator protective relays were designed/installed following a now obsolete PG&E Hydro Engineering Design Standard. The area maintenance crew have reported failures of the relays and requests to upgrade those generator relays as soon as possible.

West Point Instrumentation Upgrade will enhance monitoring provided by the new system, which will aid in the unit's startup and minimize the risk of a potential bearing wipe.

West Point Powerhouse Exciter project will ensure operational reliability by preventing unplanned outages and addressing the risk of issues during breaker removal or re-installation. By upgrading to modern, reliable equipment, the powerhouse will maintain compliance with industry standards, improve cost efficiency, and future-proof its operations for continued safe and efficient performance.

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Cost

The cost assumptions for this project are based on professional judgment of the local engineering and hydro team familiar with this type of work.

Major Project Spending Estimates
(Thousands of Nominal Dollars)

CAPITAL

Planning Order	Description	Operative Date	2024 CWIP	2025 Forecast	2026 Forecast	2027 Forecast	2028 Forecast	2029 Forecast	2030 Forecast	CWIP + 2025 - '30 Total
5792369	West Point Rewind Generator	December 2025	8,225	2,826						**11,051**
5802629	West Point Replace Generator Relays	December 2025	2,279	346						**2,625**
5802630	West Pt Upgr Gen Instruments SCADA RTDs	December 2025	2,394	617						**3,012**
5802631	West Point Replace Generator Exciter	October 2027	14	513	399	2,575				**3,499**

Benefits

- Potential avoidance of higher capital costs for a generator rewind or exciter replacement on an expedited basis if the generator windings or exciter fails.
- Potential avoidance of future O&M expense cost increases associated with maintaining this aging equipment.
- A higher level of power generation reliability resulting from a reduction in forced outages caused by this aging equipment. This results in replacement power cost savings for customers.
-

Alternatives Considered

Status Quo – Do nothing – This alternative is not recommended. This alternative assumes that no action is taken other than minimal maintenance until unplanned turbine, governor, and/or generator failure. A very long forced outage would occur until new components could be fabricated and installed resulting in additional costs for expedited work and excessive customer replacement power costs.

Alternative1: Complete Reliability Projects –This is the recommended alternative. This alternative results in the potential avoidance of future O&M expense cost increases associated with maintaining this aging equipment and a higher level of power generation reliability resulting from a reduction in forced outages caused by this aging equipment. This results in replacement power cost savings for customers. This alternative also results in the potential avoidance of higher capital costs for a generator rewind or exciter replacement on an expedited basis if the generator windings or exciter fails.

Alternative 2: Reschedule One Year – This alternative is not recommended. This alternative assumes the projects are rescheduled for one year. This alternative ultimately has the same long-term benefits as the recommended alternative; however, in the short-term, this alternative is not recommended for the same reasons discussed in the status quo.

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Project Summary

Project Title: Wildfire Mitigation Plan Commitments WMPMA
Major Work Categories: IG, KG, KI
Planning Order Numbers: 5275018, 5275076, 5275077, 5284285, 5287004, 5287180
Project Start Date: 2021
Project Completion Date: Expense – n.a.
Operative Date (only applies to Capital): Expense – n.a.

Project Description

PG&E performs inspections and repairs of switchyard assets and the surrounding area to reduce the probability of an ignition event inside the switchyard propagating beyond the switchyard fence and into the wildland. This program is supplemental to the routine inspections to further minimize the risk that substation equipment failure could cause a public or employee safety or system reliability concern (e.g., spreading a fire outside of the substation). This program performs aerial drone inspections at switchyards located in high-fire threat areas. Inspection of Power Generation assets in CPUC-defined High Fire Threat District (HFTD)/PG&E-defined high fire risk area (HFRA)/Zone 1 aligns to Utility Procedure TD-3328S, “Substation Supplemental Inspection Program” that details a risk informed inspection program. Any findings are repaired as prescribed by normal work management process.

PG&E also creates and maintains defensible space to reduce the probability of an ignition event. The requirements for defensible space are documented in LAND-5201P-01 and are in alignment with California Public Resource Code (PRC) 4291. This work is performed at all Power Generation switchyards at least once annually, but more frequently if required by vegetation regrowth. Per LAND-5201P-01, this scope includes completing a defensible space inspection as well as execution of vegetation mitigation work necessary to maintain the clean zone and reduced fuel zones around energized equipment in the switchyard.

Justification

This work is mandated to meet qualitative and quantitative compliance commitments established in PG&E’s Wildfire Mitigation Plan (WMP) regulated by California Office of Energy Infrastructure Safety (previously CPUC). As part of the WMP, PG&E commits to performing inspection and mitigation work on an annual basis at facilities that meet annually refreshed risk criteria and CPUC-defined HFTD/PG&E-defined HFRA/Zone 1 maps. This work was not previously included in a GRC filing.

In addition to compliance, this scope of work is directly tied to the Company Stand, “Catastrophic Wildfires Shall Stop”. The execution of inspections is intended to minimize the risk of a fire ignition event within powerhouse switchyards and substations that could propagate outward from electrical equipment by inspecting asset condition and defensible space boundaries.

Cost

Costs are based on spend for previous program years 2021 – 2024 with an escalation factor for inflation through 2025.

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Major Project Spending Estimates
(Thousands of Nominal Dollars)

EXPENSE

Planning Order	Description	2025 Forecast	2026 Forecast	2027 Forecast	2025 - '27 Total
5275018	PG 2024 Enhanced Swtyrd Insp (WMPMA)		1,651		**1,651**
5275076	PG 2025 Switchyard Defensible Sp. WMPMA	1,100			**1,100**
5275077	PG 2026 Switchyard Defensible Sp. WMPMA		1,024		
5287004	PG 2025 Enhanced Swtyrd Insp (WMPMA)	2,100			**2,100**
5284285	PG 2023 GRC Request - Defensible Space	400	410		**810**
5287180	Veg. Management PH defensible Space			2,250	**2,250**

Benefits

The benefit to this project is a reduction in the risk of an ignition event occurring in the switchyard and to meet CA OEIS compliance commitment.

Alternatives Considered

Status Quo: Do nothing – This alternative is not recommended. This alternative does not reduce the risk of an ignition event occurring in the switchyard and does not meet the CA OEIS compliance commitment.

Alternative 1: Perform this WFP work – This is the recommended alternative. This alternative reduces the risk of an ignition event occurring in the switchyard and meets the CA OEIS compliance commitment.

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Project Summary

Project Title: Wise 1 PH Modernization PHA
Major Work Categories: 2M **Planning Order Numbers:** 5803541 **Project Start Date:** 2023
Project Completion Date: 2029
Operative Date (only applies to Capital): May 2029

Project Description

Wise 1 PH located in Placer County, approximately two miles southwest of Auburn off Highway 80. It is part of Lower Bear River Pacific Gas and Electric (PG&E) water system, which is part of the Drum-Spaulding project, FERC license 2310. Wise 1 PH was placed in commission 1917, it contains one horizontal Francis turbine and a Westinghouse horizontal indoor unit rated at 17,000 kVA, 6,600-volt, 360 rpm. Water for Wise 1 PH is supplied from Wise Forebay, through a tunnel and riveted steel pipe and penstock, and it discharged into the South Canal, which carries the water approximately seven miles to Folsom Reservoir through Newcastle PH. Power Generation is preparing to make a digital transition of its hydroelectric powerhouse automation infrastructure. A SCADA Automation Program has been established to develop baseline standards, baseline specifications, system requirements, and templates for use in subsequent phases by operations and project teams. This project proposes to replace the existing D20 RTUs at Wise 1 PH and provide additional powerhouse automation capabilities using a new Allen-Bradley Control Logix PLCs. This includes connecting to all existing I/O including the communication port of the new digital governor provided under the Digital Governor Project. The project will also include a visualization workstation to view (local and remote) system status and the addition of a data historian for trending and analysis.

Justification

Power Generation is preparing to make a digital transition of its hydroelectric powerhouse automation infrastructure. A SCADA Automation Program has been established to develop baseline standards, baseline specifications, system requirements, and templates for use in subsequent phases by operations and project teams. Automation will also allow real time adjustments for the grid as needed based on demand and load.

Cost

The cost assumptions for this project are based on professional judgment and historic PG&E cost data for similar work.

Major Project Spending Estimates
(Thousands of Nominal Dollars)

CAPITAL

Planning Order	Description	Operative Date	2024 CWIP	2025 Forecast	2026 Forecast	2027 Forecast	2028 Forecast	2029 Forecast	2030 Forecast	CWIP + 2025 - '30 Total
5803541	Wise 1 PH Automation PHA	October 2028	744		21	433	1,784	190		**3,172**

Benefits

Potential avoidance of future O&M expense cost increases associated with maintaining this aging equipment. A higher level of power generation reliability resulting from a reduction in response time to unmanned facilities that will be able to clear alarms remotely rather than traveling to the site to restore the unit. This results in a cost savings for customers.

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Alternatives Considered

Status Quo (Do Nothing) - This alternative proposes PG&E does nothing. This alternative is not preferred given that the age of the equipment and required in person manual switching of alarms and restarting of a tripped unit.

Alternative 1- Transition of the powerhouse to an automation infrastructure allowing for remote operations and real time unit communications. This allows for less delayed responses due to travel time for an operator as well was real time adjustments for the grid as needed.

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Project Summary

Project Title: Courtright Dam Concrete Liner Repairs
Major Work Categories: 2N **Planning Order Numbers:** 5809060
Project Start Date: 2024
Project Completion Date: 2025
Operative Date: December 2025

Project Description
This project will address and mitigate observed seepage and structural damage to the dam's concrete liner facing.

Justification
The Courtright Dam is experiencing structural issues including, a settled upstream slope and increased seepage through its concrete face. Inspections revealed settlement and damaged concrete areas that are compromising the dam's integrity and operational safety. The capital repairs to be completed by this project are essential to maintain the structural integrity and functionality of the reservoir. The ongoing settlement observed at the dam crest, alongside increased seepage rates that exceed established thresholds, pose a risk to both the dam's operational efficiency and long-term viability. Also, the detection of damaged concrete areas and water leakage indicates a deterioration that compromises safety and could potentially lead to significant and costly damage.

Additionally, this project is a mitigation to the large uncontrolled water release (LGUWR) risk. More specifically, this project is part of the Internal Erosion (LGUWR-M001 – Internal Erosion) mitigation projects included in PG&Es 2024 Risk Assessment and Mitigation Phase (RAMP) filing. This project mitigates the risk of dam failure under normal operating conditions.

The CBR for LGUWR-M001 is 0.3. PG&E's risk mitigation strategies and projects within those strategies are selected to ensure that safety remains PG&E's top priority even when the quantitative modelling indicates the costs are higher than the modeled value of risk reduction**.** Other factors are considered when selecting mitigations, including the following:

Compliance: PG&E dams are regulated by two governmental agencies: FERC per Title 18 - Conservation of Power and Water Resources, Part 12 - Safety of Water Power Projects and Project Works, and DSOD per CCR Title 23 - Waters. PG&E is responsible for meeting compliance requirements and obligations to ensure its dams and associated components meet design requirements and can be operated in a reliable and safe manner. For example, dams are required to safely pass the design storm flows and not fail catastrophically for earthquakes up to the design load. Critical components such as spillway gates and LLOs, along with their power supply and backups, need to be operational during dam safety emergencies and routine operations.

Operational and Execution Considerations: Power Generation follows industry best practices as identified in the ISO 55001 certification that it achieved in March 2022. These practices include prudent risk-informed asset management approach to managing asset risk through the asset lifecycle. Absent appropriate funding to ensure continued risk reduction and prevention, a serious safety or reliability incident will likely occur in the future. The investments needed to retrofit the dams and components to meet design requirements or for upkeeping do not always have CBR scores greater than one. In general, mitigation projects that are large, complex, and require multiyear design and construction tend to have lower CBRs because of the higher

implementation costs.

CBR/Bow Tie Modeling Limitations or Uncertainties: The risk reduction may be underestimated due to data and modeling limitations. An example of such a limitation is that significant deficiencies identified by our regulators that are not satisfactorily mitigated in a timely manner could result in revoking of the license and a halt in operations. This is difficult to quantify and currently not captured in the risk modeling.

Cost

The cost assumptions for this project are based on the professional judgment of the engineers familiar with this type of work, historic PG&E cost data for similar work and proposals from vendors, constructors, and industry professionals along with estimated installation overheads.

Major Project Spending Estimates
(Thousands of Nominal Dollars)

CAPITAL

Planning Order	Description	Operative Date	2024 CWIP	2025 Forecast	2026 Forecast	2027 Forecast	2028 Forecast	2029 Forecast	2030 Forecast	CWIP + 2025 - '30 Total
5809060	Courtright Dam Concrete Liner Repairs	December 2025	5,690	280						5,970

Benefits

- Ensures safe operations at Helms by avoiding the possibility of an uncontrolled water release.
- Ensures Helms delivers a higher level of power generation reliability resulting from a reduction in forced outages caused by this aging equipment. This results in a replacement power cost savings for customers and customer saving associated with Helms being able to take energy from the CAISO during low priced time periods to pump water allowing Helms to be available to generate during high energy priced time periods.

Alternatives Considered

Status Quo: Do nothing – This alternative is not recommended. This alternative may result in an uncontrolled water release. It also may result in a lower level of power generation reliability resulting from an increase in forced outages caused by this aging equipment. This results in a replacement power costs for customers and additional customer costs associated with Helms being unable to take energy from the CAISO during low priced time periods to pump water and being unable to be available to generate during high energy priced time periods.

Alternative 1: Courtright Dam Concrete Liner Repairs – This is the recommended alternative. Repairing the dam concrete liner ensures safe operations at Helms by avoiding the possibility of an uncontrolled water release. This alternative also ensures Helms delivers a higher level of power generation reliability resulting from a reduction in forced outages caused by this aging equipment. This results in a replacement power cost savings for customers and customer saving associated with Helms being able to take energy from the CAISO during low priced time periods to pump water allowing Helms to be available to generate during high energy priced time periods.

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Project Summary

Project Title: Courtright Dam Upgrade I/D Gate Control

Major Work Categories: 2N **Planning Order Numbers:** 5778440
Project Start Date: 2018
Project Completion Date: 2025
Operative Date (only applies to Capital): December 2025

Project Description

This project will be replacing the following items:

- Intake/Discharge (I/D) gates and cylinders
- Bypass gates and cylinders
- Approximately 1,300 linear feet of concrete encased hydraulic supply and return lines, air vent line and electrical conduits.
- Safety access ladders and platforms
- Hydraulic oil containment dome
- Hydraulic indication panel

Replacement of the gates and cylinders will help ensure the continued safe and reliable operations of the Helms Pumped Storage Project (PSP) and Courtright Reservoir. This project will enhance the safety of those employees who are using the I/D gates as a clearance point, by ensuring that the gates are fully functional and capable of providing operators with gate position indication at the T1 gate house.

Justification

The I/D gates, cylinders and hydraulic lines are original plant equipment that were first commissioned in 1981 and have reached the end of its life cycle. The I/D gates serve as the only clearance point between Courtright Reservoir and the Helms turbine shut off valves (TSV). Reliable and safe gate operations are required for performing all maintenance, repairs, and inspections on the T1 gate, tunnels, penstocks, surge chamber, and TSVs.

During the 2021-2022 outage, hydraulic oil was identified on the reservoir's surface around the I/D structure. After further investigation it was identified that the valves on the oil pollution domes had inadvertently been opened and hydraulic oil from a faulty/aged hydraulic line had been the likely source of the discharge. The incident was immediately reported to the Federal Energy Regulatory Commission (FERC) environmental team and the Forest Service (FS). PG&E was restricted from operating Helms PSP until the site had been remediated and the hydraulic line repaired. Had Helms not already been in a long duration outage this incident would have forced out the units at Helms for 3-4 weeks while the situation was addressed. Additionally, no fine was issued as part of this uncontrolled release, because PG&E was able to show that proactive measures were being taken to replace the hydraulic systems prior to the release. Had a fine been issued it likely would have been in the tens of millions of dollars.

This project will help ensure the safe and reliable operation of Helms PSP and will also mitigate the risk of having an uncontrolled release of hydraulic oil into a publicly used recreation reservoir.

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Additionally, this project is a mitigation to the Large Uncontrolled Water Release (LGUWR) risk. More specifically, this project is a part of the LLO Refurbishment (LGUWR-M004 – LLO Refurbishments) mitigation projects included in PG&Es 2024 Risk Assessment and Mitigation Phase (RAMP) filing. PG&E implements LLO refurbishments (LGUWR-M004) to ensure the reservoir can be drained during an emergency or for dam operation and maintenance. LLOs do not directly mitigate the three major drivers (flood, seismic, and normal) but maintaining reliable operation of the LLOs is critical to lower the reservoir after a seismic event or during the progression of internal erosion failure modes to prevent a more catastrophic failure or to provide water movement during storm events and/or downstream water delivery obligations as an Instream Flow Release (IFR).

PG&E's risk mitigation strategies are selected to ensure that safety remains PG&E's top priority even when the quantitative modelling indicates the costs are higher than the modeled value of risk reduction**.** Other factors are considered when selecting mitigations, including the following:

Compliance Requirements: PG&E dams are regulated by two governmental agencies: FERC per CFR Title 18 - Conservation of Power and Water Resources, Part 12 - Safety of Water Power Projects and Project Works, and DSOD per CCR Title 23 - Waters. PG&E is responsible for meeting compliance requirements and obligations to ensure its dams and associated components meet design requirements and can be operated in a reliable and safe manner. For example, dams are required to safely pass the design storm flows and not fail catastrophically for earthquakes up to the design load. Critical components such as spillway gates and LLOs, along with their power supply and backups, need to be operational during dam safety emergencies and routine operations. PG&E is responsible for maintaining the LLOs as required by the PG&E Dam Safety Program and to ensure continued asset ownership and appropriate level of risk management. This program is mandated by Federal and State regulators and compliance requirements which aligns with the requirement to maintain operational capacity to operate the dam safely to prevent harm to public and environmental resources. This program is part of PG&E's Dam Safety Program, Safe Dam Operating Capacity Metric and follows the FERC engineering guidelines and DSOD requirements.

Operational and Executional Considerations: Power Generation follows industry best practices as identified in the ISO 55001 certification that it achieved in March 2022. These practices include a prudent risk-informed asset management approach to managing asset risk through the asset lifecycle. Absent appropriate funding to ensure continued risk reduction and prevention, a serious safety or reliability incident will likely occur in the future. The investments needed to retrofit the dams and components to meet design requirements or for upkeeping do not always have CBR scores greater than one. In general, mitigation projects that are large, complex, and require multiyear design and construction tend to have lower CBRs because of the higher implementation costs.

Bowtie Modeling Limitations: The risk reduction may be underestimated due to data and modeling limitations. An example of such a limitation is that significant deficiencies identified by our regulators that are not satisfactorily mitigated in a timely manner could result in revoking of license and a halt in operations. This is difficult to quantify and currently not captured in the risk modeling.

All projects within the LGUWR-M004 – LLO Refurbishments are essential in ensuring the long-term safe and reliable operations of PG&E dams and are directed at preventing a large uncontrolled water release incident.

Cost

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The cost assumptions for this project are based on the professional judgment of the engineers familiar with this type of work, historic PG&E cost data for similar work and secured proposal cost from vendors, constructors, and industry professionals along with estimated installation overheads.

Major Project Spending Estimates
(Thousands of Nominal Dollars)

CAPITAL

Planning Order	Description	Operative Date	2024 CWIP	2025 Forecast	2026 Forecast	2027 Forecast	2028 Forecast	2029 Forecast	2030 Forecast	CWIP + 2025 - '30 Total
5778440	Courtright Dam Upgrade I/D Gate Control	December 2025	17,437	4,018						**21,455**

Benefits

The Courtright Dam Upgrade I/D Gate Cylinder and Hydraulic Lines project will decrease the likelihood of an environmental incident related to releasing oil to the reservoir by replacing hydraulic equipment that is nearing the end of its useful life. Replacing this equipment results in the avoidance of future O&M expense cost increases associated with maintaining this aging equipment. In addition, a higher level of power generation reliability will be realized resulting from a reduction in forced outages caused by this aging equipment. This results in a replacement power cost savings for customers.

Alternatives Considered

Status Quo – This alternative is not recommended due to the risk of an environmental incident related to releasing oil to the reservoir caused by this equipment that is nearing the end of its useful life. This alternative results in future O&M expense cost increases associated with maintaining this aging equipment. In addition, this alternative results in a higher level of forced outages caused by this aging equipment and the associated replacement power costs for customers.

Alternative 1: Repair the Equipment – This alternative is not recommended due to the equipment nearing the end of its useful life. Repairing this equipment is simply not feasible.

Alternative 2: Refurbish the Equipment – This alternative is not recommended due to the equipment nearing the end of its useful life and the amount of time it would take for completing the work.

Alternative 3: Replace the Equipment (recommended) – This is the current recommended alternative. This alternative will decrease the likelihood of an environmental incident related to releasing oil to the reservoir by replacing hydraulic equipment that is nearing the end of its useful life. Replacing this equipment results in the avoidance of future O&M expense cost increases associated with maintaining this aging equipment. In addition, a higher level of power generation reliability will be realized resulting from a reduction in forced outages caused by this aging equipment. This results in a replacement power cost savings for customers.

Alternative 4: Retire the Equipment – This alternative is not recommended because the equipment is necessary for dam operations and subsequently necessary for Helms PSP operations. With the tremendous value that Helms PSP provides to customers, it would be short sighted to simply retire this equipment and subsequently stop operating the dam and Helms PSP.

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Project Title: CV Dam Repl Gates, Stems, Guides, Actuators & Intake Tower Seismic Upgrade
Major Work Categories: 2L
Planning Order Numbers: 5789325, 5774800
Project Start Date: 2017 / 2020
Project Completion Date: 2028
Operative Date (only applies to Capital): 5789325 – October 2027, 5774800 – December 2027

Project Description

The intake gates, associated operating mechanisms, and intake tower are original equipment commissioned in the late 1910's. These gates are operated from the intake tower at Bass Lake serving as the Crane Valley (CV) Dam low-level outlets (LLO) and intake to Crane Valley PH via tunnel and penstock. Due to their age and condition, it is recommended to replace the gates and associated equipment and to change from manual operation of the gates from the intake tower to electric operation from the dam crest while also adding SCADA control. In addition to the gates the project will correct the seismic vulnerability of the Crane Valley Dam Intake Tower.

Justification

As a follow-up to a recommendation from the Federal Energy Regulatory Commission (FERC) Part 12D Inspection at Crane Valley Dam, the intake tower was evaluated for seismic stability to assess the impact of its performance on the capacity of the outlet tunnel. Evaluation determined the structure had insufficient strength to resist the expected seismic loads.

The intake gates and associated operating mechanisms are original equipment commissioned in the late 1910's. Although these gates successfully operate through full travel tests it was noted two of the four gates had experienced increased resistance while travelling fully closed and attempts to dewater the intake tunnel proved unsuccessful due to leakage at the gates. Due to their age and condition, it is recommended to replace the gates and associated equipment and to change from manual operation of the gates from the intake tower to electric operation from the dam crest while also adding SCADA control.

Operating the current LLO slide gates requires O&M staff to access the top of the tower which is done by: trailering a boat to Bass Lake, launch it, break apart the booms, navigate over the booms to the tower, motor the boat to the tower, climb from the boat to the ladder on the tower, and climb 5 feet to 30 feet (depending on lake level) up the ladder over water to get onto the tower to perform the work. For gate operations, water crew staff uses a portable generator, and a Rigid handheld power take off tool (pipe-threader type) to spin the operating gears and raise the slide gates. There are four gates total, and each takes 40 minutes to move from fully open to fully closed, a full cycle of just one gate takes almost 1.5 hours. Gate operation is governed by a Job Hazard Analysis (JHA). If there was a need during an emergency to access the intake tower for gate closure in winter or during adverse storm events there's increased safety risk and operational delays. This change will mitigate operational and safety access challenges while also improving dam safety by decreasing response time to operation the intake tower's gates.

Additionally, these projects are mitigations to the Large Uncontrolled Water Release (LGUWR) risk. More specifically, these projects are part of the Seismic (LGUWR-M003 – Seismic Retrofit) and Low-level Outlet (LLO) (LGUWR-M004 – LLO Refurbishment) mitigation projects included in PG&Es 2024 Risk Assessment and Mitigation Phase (RAMP) filing.

The CBR for LGUWR-M003 is 0.4. The CBR for LGWUR-M004 is 3.3. PG&E's risk mitigation strategies are selected to ensure that safety remains PG&E's top priority even when the quantitative modelling indicates the costs are higher than the modeled value of risk reduction**.** Other factors are considered when selecting mitigations, including the following:

Compliance Requirements: PG&E dams are regulated by two governmental agencies: FERC per CFR Title 18 - Conservation of Power and Water Resources, Part 12 - Safety of Water Power Projects and Project Works, and DSOD per CCR Title 23 - Waters. PG&E is responsible for meeting compliance requirements and obligations to ensure its dams and associated components meet design requirements and can be operated in a reliable and safe manner. For example, dams are required to safely pass the design storm flows and not fail catastrophically for earthquakes up to the design load. Critical components such as spillway gates and LLOs, along with their power supply and backups, need to be operational during dam safety emergencies and routine operations. PG&E is responsible for maintaining the LLOs as required by the PG&E Dam Safety Program. This program is mandated by Federal and State regulators and compliance requirements which aligns with the requirement to maintain operational capacity to operate the dam safely to prevent harm to public and environmental resources. This program is part of PG&E's Dam Safety Program, Safe Dam Operating Capacity Metric and follows the FERC engineering guidelines and DSOD requirements.

Operational and Executional Considerations: Power Generation follows industry best practices as identified in the ISO 55001 certification that it achieved in March 2022. These practices include a prudent risk-informed asset management approach to managing asset risk through the asset lifecycle. Absent appropriate funding to ensure continued risk reduction and prevention, a serious safety or reliability incident will likely occur in the future. The investments needed to retrofit the dams and components to meet design requirements or for upkeeping do not always have CBR scores greater than one. In general, mitigation projects that are large, complex, and require multiyear design and construction tend to have lower CBRs because of the higher implementation costs.

Bowtie Modeling Limitations: The risk reduction may be underestimated due to data and modeling limitations. An example of such a limitation is that significant deficiencies identified by our regulators that are not satisfactorily mitigated in a timely manner could result in revoking of license and a halt in operations. This is difficult to quantify and currently not captured in the risk modeling.

These projects are working to mitigate the LGUWR risk by restoring long term operability of the gates and the tower's ability to withstand new seismic design criteria requirements.
PG&E reports out regularly on the status of these projects to FERC and Division of Safety of Dams (DSOD).

Cost
The cost assumptions for these projects are based on the professional judgment of the engineers familiar with this type of work and historic PG&E cost data for similar work.

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Major Project Spending Estimates
(Thousands of Nominal Dollars)

CAPITAL

Planning Order	Description	CBR	Operative Date	2024 CWIP	2025 Forecast	2026 Forecast	2027 Forecast	2028 Forecast	2029 Forecast	2030 Forecast	CWIP + 2025 - '30 Total
5774800	Crane Valley Dam – Intake Tower Seismic Upgrade	0.3	December 2027	2,325	364	1,249	5,550	15			**9,502**
5789325	CVD Replace Gates, Stems, Guides & Actuator	.003	October 2027	878	560	1,686	5,651				**8,776**

Benefits

These two projects will ensure compliance with FERC and DSOD and ensure long-term reliability of the Crane Valley Dam LLOs by replacing aging components and making necessary upgrades to improve operational controls and seismic stability. These projects reduce the risk of a LGUWR.

Alternatives Considered

Status Quo: Do nothing - This is not a viable alternative because it will not ensure compliance with FERC and DSOD and it will not ensure long-term reliability of the LLOs resulting in a potential safety issue from a large uncontrolled water release.

Alternative 1: Implement both projects – This is the recommended alternative. These two projects will ensure compliance with FERC and DSOD and ensure long-term reliability of the Crane Valley Dam LLOs by replacing aging components and making necessary upgrades to improve operational controls and seismic stability reducing the risk of a large uncontrolled water release.

Alternative 2: Delay the project by one year – This alternative is not recommended. It has the same long-term benefits of Alternative 1, but it does not ensure timely compliance with FERC and DSOD and delays the necessary upgrades in operational controls and seismic stability.

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Project Title: Dam Maintenance Dredging

Major Work Categories: AX
Planning Order Numbers: 5287183
Project Start Date: 2027
Project Completion Date: Expense – n.a.
Operative Date (only applies to Capital): Expense – n.a.

Project Description

A dredging maintenance strategy and plan determine the risk reduction activities required to improve the of operations of dams and power production. This will be an enhanced maintenance program implemented for dams/reservoirs throughout the hydro generation system and will also provide improved access and operational use for low-level outlets (LLO), power tunnels and gates, upstream dam faces & trash racks.

The project objectives are to maintain safe and reliable operations of PG&E dams and to reduce impacts to the water moving assets. The maintenance of these facilities will increase water storage and availability for operating dam assets to deliver downstream water requirements; improve the reliability and safe power generation and the increase ability to manage the dam assets in case of a dam emergency.

The project may include dive activities, remote operated vehicle inspections to support program implementation, extensive planning and possible permits and regulatory approvals.

Justification,

This project is a control to the Large Uncontrolled Water Release (LGUWR) risk. More specifically, this project is part of the Maintenance (LGUWR-C001 – Maintenance) mitigation projects included in PG&Es 2024 Risk Assessment and Mitigation Phase (RAMP) filing. Without a dredging maintenance program, the historic operations availability will continue to impact the components and operability of dams and inherently cause risk to power production and dam safety. The program implementation is also to ensure the ability to inspect, monitor and repair the dams upstream faces and functionality of all appurtenant structures. The program will inform on the risk mitigation strategy of dredging projects that will largely reduce the impact for dam operations and/or license compliance violations and focused on projects with highest risk reduction.

The CBR for LGUWR-C001 is 0.4. PG&E's control projects are selected to ensure that safety remains PG&E's top priority even when the quantitative modelling indicates the costs are higher than the modeled value of risk reduction**.** Other factors are considered when selecting mitigations, including the following:

Compliance Requirements: PG&E dams are regulated by two governmental agencies: FERC per CFR Title 18 - Conservation of Power and Water Resources, Part 12 - Safety of Water Power Projects and Project Works, and DSOD per CCR Title 23 - Waters. PG&E is responsible for meeting compliance requirements and obligations to ensure its dams and associated components meet design requirements and can be operated in a reliable and safe manner. For example, dams are required to safely pass the design storm flows and not fail catastrophically for earthquakes up to the design load. Critical components such as spillway gates and LLOs, along with their power supply and backups, need to be operational during dam safety emergencies and routine operations. PG&E is responsible for maintaining the LLOs as required by the PG&E Dam Safety Program and regulations. This program is part of PG&E's Dam Safety Program, potentially impacts the Safe Dam Operating Capacity Metric and follows the FERC engineering guidelines and DSOD requirements.

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Operational and Executional Considerations: Power Generation follows industry best practices as identified in the ISO 55001 certification that it achieved in March 2022. These practices include a prudent risk-informed asset management approach to managing asset risk through the asset lifecycle. Absent appropriate funding to ensure continued risk reduction and prevention, a serious safety or reliability incident will likely occur in the future.

Bowtie Modeling Limitations: The risk reduction may be underestimated due to data and modeling limitations. An example of such a limitation is that significant deficiencies identified by our regulators that are not satisfactorily mitigated in a timely manner could result in revoking of license and a halt in operations. This is difficult to quantify and currently not captured in the risk modeling.

All projects within the LGUWR-C001 – Maintenance are essential in ensuring the long-term safe and reliable operations of PG&E dams and are directed at preventing a large uncontrolled water release incident.

Cost

The cost assumptions for this project are based on professional judgment, engineering input, and historic PG&E cost data for similar work.

Major Project Spending Estimates
(Thousands of Nominal Dollars)

EXPENSE

Planning Order	Description	CBR	2025 Forecast	2026 Forecast	2027 Forecast	2025-2027 Forecast
5287183	Dredging Program (Maintenance)	1.3			1,800	**1,800**

Benefits

The program is to ensure a clear path of water flow through low-level outlets (LLO) and power tunnels to prevent large uncontrolled water (LGUWR) risk. The project also helps to ensure safe operation and reduce impacts to the LLO valve, intake racks, and potential impacts to the upstream dam face.

The project will minimize the need for large-scale dredging projects. In the long term this will help to prevent an increase in costs and allow for operating in a proactive and instead of a reactive level to be able to efficiently plan mitigation controls and identify the best manner of mitigations.

Alternatives Considered

Status Quo – This approach is not recommended. This approach would impact water delivery to customers, negatively affect safe dam operations in the case of a high flow event, and would violate water release conditions stated in the FERC licenses. PG&E is required by regulation to ensure LLO's are maintained and in good working order and this dredging work enables that.

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Alternative 1 – This is the recommended alternative. The creation and implementation of a dredging maintenance program provides for routine inspection, helps ensure safe and reliable operations, results in a reduction in risk of a LGUWR, and helps ensure FERC license compliance.

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Project Summary

Project Title: Low-level Outlet Program – Dam Outlets
Major Work Categories: 2N, 2M
Planning Order Numbers: 5812062, 5812200, 5812324, 5783130, 5812184, 5812320, 5789325, 5780885, 5812325, 5798439, 5792573, 5812332, 5809988, 5812200, 5805464, 5802879, 5812101, 5811070, 5779638
Project Start Date: Varies
Project Completion Date: Varies
Operative Date: Varies

Project Description

The Low-level Outlet (LLO) Program is executed to inform and execute a collection of improvements to the dam outlets that exist at PG&E Hydro Dam facilities. These improvements to the LLOs include but not limited to upgrades and/or replacement of conduit, outlet tunnels, grates/grizzles, power systems, operator systems, hoists, motors, valves and gates systems and primary and secondary structural members, structural supports, concrete aprons and outlet towers. These projects improve PG&E Hydro Dam facilities outlets, water delivery, management and used for operational reliability during normal operational conditions, seismic conditions and flood operational conditions.

Justification

These projects are mitigations to the large uncontrolled water release (LGUWR) risk. More specifically, these projects are part of the LLO Refurbishment (LGUWR-M004 – LLO Refurbishments) mitigation projects included in PG&Es 2024 Risk Assessment and Mitigation Phase (RAMP) filing. PG&E implements LLO refurbishments (LGUWR-M004) to ensure the reservoir can be drained during an emergency or for dam operation and maintenance. LLOs do not directly mitigate the three major drivers (flood, seismic, and normal) but maintaining reliable operation of the LLOs is critical to lower the reservoir after a seismic event or during the progression of internal erosion failure modes to prevent a more catastrophic failure or to provide water movement during storm event and/or downstream water delivery obligations as a Instream Flow Release(IFR).

The CBR for LGUWR-M004 is 3.3. PG&E's risk mitigation strategies are selected to ensure that safety remains PG&E's top priority even when the quantitative modelling indicates the costs are higher than the modeled value of risk reduction. Other factors are considered when selecting mitigations, including the following:

Compliance Requirements: PG&E dams are regulated by two governmental agencies: FERC per CFR Title 18 - Conservation of Power and Water Resources, Part 12 - Safety of Water Power Projects and Project Works, and DSOD per CCR Title 23 - Waters. PG&E is responsible for meeting compliance requirements and obligations to ensure its dams and associated components meet design requirements and can be operated in a reliable and safe manner. For example, dams are required to safely pass the design storm flows and not fail catastrophically for earthquakes up to the design load. Critical components such as spillway gates and LLOs, along with their power supply and backups, need to be operational during dam safety emergencies and routine operations. PG&E is responsible for maintaining the LLOs as required by the PG&E Dam Safety Program and to ensure continued asset ownership and appropriate level of risk management. This program is mandated by Federal and State regulators and compliance requirements which aligns with the requirement to maintain operational capacity to operate the dam safely to prevent harm to public and environmental resources. This program is part of PG&E's Dam Safety Program, Safe Dam Operating Capacity Metric and follows the FERC engineering guidelines and DSOD requirements.

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Operational and Executional Considerations: Power Generation follows industry best practices as identified in the ISO 55001 certification that it achieved in March 2022. These practices include a prudent risk-informed asset management approach to managing asset risk through the asset lifecycle. Absent appropriate funding to ensure continued risk reduction and prevention of a serious safety or reliability incident will likely occur in the future. The investments needed to retrofit the dams and components to meet design requirements or for upkeeping do not always have CBR scores greater than one. In general, mitigation projects that are large, complex, and require multiyear design and construction tend to have lower CBRs because of the higher implementation costs.

CBR/Bow Tie Modeling Limitations or Uncertainties: The risk reduction may be underestimated due to data and modeling limitations. An example of such a limitation is that significant deficiencies identified by our regulators that are not satisfactorily mitigated in a timely manner could result in revoking of license and a halt in operations. This is difficult to quantify and currently not captured in the risk modeling.

All projects within the LGUWR-M004 – LLO Refurbishments are essential in ensuring the long-term safe and reliable operations of PG&E dams and are directed at preventing a large uncontrolled water release incident.

Cost

The cost assumptions for these projects are based on the professional judgment of the engineers familiar with this type of work and historic PG&E cost data for similar work.

Major Project Spending Estimates
(Thousands of Nominal Dollars)

CAPITAL

Planning Order	Description	CBR[2]	Operative Date	2024 CWIP	2025 Forecast	2026 Forecast	2027 Forecast	2028 Forecast	2029 Forecast	2030 Forecast	CWIP + 2025 - '30 Total
5783130	Balch Abay Dam Repl 22 Needle Vlv Actuat	n.a.	December 2026	73		689	70				**832**
5812184	Crane Valley Dam Replace Needle Valve	0.02	December 2032							703	**703**
5812320	Cresta Dam Restore LLO & Dredge	0.2	December 2030				143	183	208	469	**1,003**
5812324	Lake Almanor Dam Intake Tower Retrofit	0.1	December 2030				238	229	1,560	4,217	**6,245**
5812325	Lake Almanor LLO Retrofit Disc Structure	215.2	December 2030							234	**234**
5798439	Manzanita Dam Refurbish LLO	n.a.	October 2026	557	684	928	9				**2,178**
5792573	McCloud Dam LLO Repl 5x7 SG Actuator	0.3	December 2029				143	195	2,426	47	**2,810**
5812332	Rock Creek Dam Restore LLO & Dredge	0.2	December 2030	173			143	183	208	469	**1,175**
5809988	Strawberry Intake Tower Replace Hardware	16.4	June 2027			155	238				**393**

[2] CBRs are only provided for LGUWR mitigation or control projects with operative dates and/or costs within the 2027-2030 GRC period and beyond. CBRs are not calculated for programs with pre 2027 operative dates.

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5812200	Wishon Dam Replace HB Valve	1.1	December 2031							703	**703**
5805464	Crane Valley IFR LLO Pipe	n.a.	December 2025	198	1,200						**1,398**
5802879	LA Canyon Dam LLO Replace Gate 1 Stem	n.a.	December 2025	0	60						**60**
5812101	Lower Bear Intake Gate motor replacement	n.a.	October 2026			223					**223**
5811070	Rock Creek Dam Repl IFR and Guard Valves	n.a.	December 2026	7		621					**628**
5779638	TC Reg LLO Automation and HRTU Upgrade	n.a.	December 2025	480	498	24					**1,003**

Benefits

- Compliance with FERC engineering guidelines and DSOD requirements.
- Reduce the risk of large uncontrolled water release resulting in public safety risks and risks to the environment.
- Potential avoidance of future O&M expense cost increases associated with maintaining this aging equipment.
- Potential avoidance of higher capital costs for equipment/system replacement on an expedited basis if any of the major equipment or systems fails.
- A higher level of power generation reliability resulting from a reduction in forced outages caused by this aging equipment. This results in replacement power cost savings for customers.

Alternatives Considered

Status Quo – Do Nothing. This alternative is not recommended. This alternative assumes that no action is taken other than minimal maintenance until an unplanned failure. This alternative does not comply with the FERC engineering guidelines and DSOD requirements and results in a possible large uncontrolled water release resulting in public safety risks and risks to the environment and a potential of future O&M expense cost increases associated with maintaining this aging equipment. Also, a very long forced outage would occur until new components could be fabricated and installed resulting in additional costs for expedited work and replacement power costs for customers.

Alternative 1: Replace/Refurbish – This is the recommended alternative. This alternative complies with FERC engineering guidelines and DSOD requirements and results in a potential avoidance of future O&M expense cost increases associated with maintaining this aging equipment; the potential avoidance of higher capital costs for equipment/system replacement on an expedited basis if any of the major equipment or systems fail; and a higher level of power generation reliability resulting from a reduction in forced outages caused by this aging equipment. This results in replacement power cost savings for customers.

Alternative 2: Reschedule One Year – This alternative is not recommended. This alternative assumes the projects are rescheduled for one year. This alternative ultimately has the same long-term benefits as the recommended alternative; however, in the short-term, this alternative is not recommended for the same reasons discussed in the status quo.

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Project Summary

Project Title: Dam Safety Camera (HAWC Cameras)

Major Work Categories: 2P, AX
Planning Order Numbers: 5812246, 5287002
Project Start Date: 5812246 – 2029, 5287002 – 2025
Project Completion Date: 5812246 – December 2032, 5287002 – Expense, n.a.
Operative Date (only applies to Capital): 5812246 – December 2032

Project Description

Power Generation hydro operations and dam safety need cameras to monitor dam facilities during abnormal conditions (e.g., floods, earthquakes, SCADA outages) or when physical access is restricted (e.g., remote locations, operational challenges, adverse weather). This project aims to address the significant challenge of providing real-time video capture in remote areas without traditional cellular connectivity. These cameras will also benefit PG&E's Wildfire Risk camera system.

Justification

These projects are mitigations to the large uncontrolled water release (LGUWR) risk. More specifically, these projects are part of the Physical Security (LGUWR-M005 – Physical Security) mitigation program included in PG&Es 2024 Risk Assessment and Mitigation Phase (RAMP) filing. PG&E implements mitigations against physical attack (LGUWR-M005) to reduce the likelihood of malicious threats from third party individuals or groups on dam safety. Mitigation projects for LGUWR-M005 and installing surveillance monitoring systems. Power Generation hydro operations and dam safety need cameras to monitor dam facilities during abnormal conditions (e.g., floods, earthquakes, SCADA outages) or when physical access is restricted (e.g., remote locations, operational challenges, adverse weather). There are also FERC requirements to install cameras on several dams.

The CBR for LGUWR-M005 is 0.002. PG&E's risk mitigation strategies are selected to ensure that safety remains PG&E's top priority even when the quantitative modelling indicates the costs are higher than the modeled value of risk reduction**.** Other factors are considered when selecting mitigations, including the following:

Compliance Requirements: PG&E dams are regulated by two governmental agencies: FERC per CFR Title 18 - Conservation of Power and Water Resources, Part 12 - Safety of Waterpower Projects and Project Works, and DSOD per CCR Title 23 - Waters. PG&E is responsible for meeting compliance requirements and obligations to ensure its dams and associated components meet design requirements and can be operated in a reliable and safe manner. For example, dams are required to safely pass the design storm flows and not fail catastrophically for earthquakes up to the design load. Critical components such as spillway gates and LLOs, along with their power supply and backups, need to be operational during dam safety emergencies and routine operations.

Operational and Executional Considerations: Power Generation follows industry best practices as identified in the ISO 55001 certification that it achieved in March 2022. These practices include a prudent risk-informed asset management approach to managing asset risk through the asset lifecycle. Absent appropriate funding to ensure continued risk reduction and prevention of a serious safety or reliability incident will likely occur in the future.

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CBR/Bow Tie Modeling Limitations or Uncertainties: The risk reduction may be underestimated due to data and modeling limitations. An example of such a limitation is that significant deficiencies identified by our regulators that are not satisfactorily mitigated in a timely manner could result in revoking of license and a halt in operations. This is difficult to quantify and currently not captured in the risk modeling.

All projects within the LGUWR-M005 – Physical Security are essential in ensuring the long-term safe and reliable operations of PG&E dams and are directed at preventing a large uncontrolled water release incident.

Cost

The cost assumptions for this project are based on professional judgment, engineering input, and historic PG&E cost data for similar work.

Major Project Spending Estimates
(Thousands of Nominal Dollars)

CAPITAL

Planning Order	Description	CBR	Operative Date	2024 CWIP	2025 Forecast	2026 Forecast	2027 Forecast	2028 Forecast	2029 Forecast	2030 Forecast	CWIP + 2025 - '30 Total
5812246	Dam Safety Camera (HAWC Cameras)	0.1	December 2032						1,560	1,406	**2,966**

EXPENSE

Planning Order	Description	CBR	2025 Forecast	2026 Forecast	2027 Forecast	2025-2027 Forecast
5287002	Dam Safety Camera (HAWC Cameras)	n.a.			500	**500**

Benefits

The cameras will provide near real-time monitoring capabilities of the dams, significantly reduce response time in emergency situations, and relieve labor shortages. Cameras will be utilized by Hazard Awareness & Warning Center organization.

Alternatives Considered

Status Quo – Do nothing. This alternative is not recommended. This alternative does not address the need to safely monitor dam activities in real time during abnormal conditions. In an abnormal event, PGE personnel may be required to travel to the dam to monitor the activity. This travel time can drastically change PG&E's mitigations due to the delayed response.

Alternative 1: Install and Maintain HAWC Cameras –This is the recommended alternative. This alternative increases the safety of the dam systems by monitoring our dams in real time. This reduces the risk in response time in the event of abnormal conditions.

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Project Title: Dams O&M Inspection/Maintenance/Repairs - C001-Maintenance
Major Work Categories: AX, 2N
Planning Order Numbers: 5000528, 5000529, 5000530, 5000531, 5000532, 5000533, 5009055, 5014629, 5014630,5018935, 5020449, 5021849, 5287454, 5287455, 5511186, 5511187, 5511188, 5511189,
Project Start Date: See Expense Table
Project Completion Date: Expense – n.a.
Operative Date (only applies to Capital): Expense – n.a.

Project Description

Maintenance projects are comprised of routine Operational & Maintenance (O&M) activities and inspections. Examples include routine vegetation management, rodent abatement, and general maintenance activities for dams and around reservoirs and support facilities and supporting assets. Power Generation performs annual regulatory inspections and monthly internal dam surveillance inspections to inform on control activities required. Maintaining dam structures is essential to managing the risk mitigations through routine operational activity. A robust maintenance control program reduces the execution timing need for large capital restoration work and/or improvements.

O&M teams are responsible for identifying and documenting abnormal conditions during routine monthly inspections, identifying the work required and creating the appropriate notification and timeline based on urgency. O&M inspectors evaluate the extent of damage and consult with dam safety engineering (DSE) for specific repair methods, further DSE recommendations and ensure the appropriate regulatory approval.

The type of mitigation controls to ensure continuous dam operations involve:

- Routine concrete patching, providing continued risk reduction and overall operation improvement to ensure the dams continue safe operations.
- Routine dam concrete drain inspection and cleaning as part of maintenance control.
- O&M routine inspections identify and action rodent burrowing activities working with dam safety, asset engineering and contract resources
- O&M ensures dam faces, dam access and associated facilities area clear of impeding vegetation

Justification

These projects are controls to the Large Uncontrolled Water Release (LGUWR) risk. More specifically, these projects are part of the Maintenance (LGWUR-C001 – Maintenance) control projects included in PG&Es 2024 Risk Assessment and Mitigation Phase (RAMP) filing.

The CBR for LGUWR-C001 is 0.4. PG&E's management of risk ensures that safety remains PG&E's top priority even when the quantitative modelling indicates that projects costs are higher than the modeled value of risk reduction**.** Other factors are considered when selecting control mitigations, include following:

Operational and Execution Considerations: Most identified concrete repair locations, drain inspections, vegetation management activities and rodent abatement activities are proactive operations and maintenance risk mitigations to ensure continued safe operation of the dam. O&M proactive risk mitigation actions are dam asset owners function to ensure continued safe and operating dams as identified in the ISO 55001 certification, achieved in March 2022. These practices include prudent risk-informed asset management approach to managing asset risk

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Compliance Requirement: FERC Licenses require adequate operations & maintenance (Hydro). CFR Title 18 - Conservation of Power and Water Resources, Part 12 - Safety of Water Power Projects and Project Works, requires a FERC licensee to use sound and prudent engineering practices in any action relating to the design, construction, operation, maintenance, use, repair, or modification of a water power project or project works (Hydro). Since FERC and DSOD conduct annual inspections of the dams, some of the identified patching efforts are formal recommendations from the inspection reports. Some of the recommendations from the FERC/DSOD inspection reports require a formal regulatory Plan and Schedule communication to be submitted for action and in response to the annual inspection reports, hence a regulatory commitment.

All LGUWR-C001 – Maintenance projects are essential in ensuring the long-term safe and reliable operations of PG&E dams.

Cost

The cost assumptions for this project are based on professional judgment of the local engineering and hydro team familiar with this type of work.

Major Project Spending Estimates
(Thousands of Nominal Dollars)

CAPITAL

Planning Order	Description	CBR	Operative Date	2024 CWIP	2025 Forecast	2026 Forecast	2027 Forecast	2028 Forecast	2029 Forecast	2030 Forecast	CWIP + 2025 - '30 Total
5511186	DeSabla Inst/Repl Rsrvrs, Dams & Wtrwys	0.6	As installed	0	100	85	115	122	152	151	**726**
5511187	Shasta Inst/Repl Rsrvrs, Dams & Wtrwys	0.5	As installed	54	100	85	115	122	152	151	**780**
5511188	Drum Inst/Repl Rsrvrs, Dams & Wtrwys	0.2	As installed	45	100	85	115	122	152	151	**771**
5511189	MLode Inst/Repl Rsrvrs, Dams & Wtrwys	0.1	As installed			85	115	122	152	151	**626**

EXPENSE

Planning Order	Description	CBR	2025 Forecast	2026 Forecast	2027 Forecast	2025-2027 Forecast
5000528	Shasta Maint Reservoirs/Dams/Waterways	0.03	1,040	1,065	1,693	**3,798**
5000529	DeSabla Maint Reserv, Dams & Waterways	0.1	874	895	1,401	**3,170**
5000530	Drum Maint Reservoirs/Dam/Waterways	0.009	2,764	2,829	3,262	**8,855**
5000531	MLode Maint Reservoirs/Dams/Waterways	0.002	3,660	3,746	4,205	**11,611**
5000532	KCV Maint Reservoirs/Dams/Waterways	0.000	1,669	1,709	2,111	**5,489**
5000533	Helms Maint Reservoirs/Dams/Waterways	0.001	63	65	344	**472**
5009055	Potter Valley Maintain Dams & Reservoirs	0.000	486	497	511	**1,494**
5014629	Drum Vegetation Management	0.02	1,234	1,263	1,665	**4,161**
5014630	ML Vegetation Management	0.01	1,099	1,125	1,156	**3,380**

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5018935	KCV Vegetation Management	0.002	673	688	708	**2,069**
5020449	DeSabla NFFR Veg Mgmt	0.1	322	329	652	**1,303**
5021849	Helms Vegetation Management	0.002	221	226	232	**679**
5287454	Dams Concrete Drain Cleaning and Inspection	3.7			800	**800**

Benefits

O&M actions proactively manage the health of PG&E dams.
This work also increases the reliability of PG&E Hydro Dam Facilities and operational capacity during normal operating conditions and high flow/flood conditions.

Alternatives Considered

Status Quo: Do nothing – This alternative is not recommended. This alternative assumes that no action is taken other than minimal maintenance until unplanned failure. A very long forced outage would occur until new components could be fabricated and installed resulting in additional costs for expedited work and excessive customer replacement power costs.

Alternative1: Dams O&M Inspection/Maintenance/Repairs –This is the recommended alternative. This alternative results in the proactive management of the health of PG&E's dams. This work also increases the reliability of PG&E Hydro Dam Facilities and operational capacity during normal operating conditions and high flow/flood conditions.

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Project Title: Federal Energy Regulatory Commission (FERC) Security Improvements Program
Major Work Categories: 2L, 3H, IG, KG
Planning Order Numbers: See table below
Project Start Date: 2024
Project Completion Date: 2033
Operative Date (only applies to Capital): 5792732, 5808990 – December 2025

Project Description

As a FERC licensee, Pacific Gas & Electric (PG&E), is responsible for the physical and cyber security of the company's FERC Projects. These include, but are not limited to, Vulnerability and Security Assessments; resolution of any security measures that may conflict with License requirements including minimizing interruptions to recreational use to the greatest extent possible; and maintaining open communications with the Federal Energy Regulatory Commission (FERC) regarding suspicious activity, security breaches or incidents, and compliance with Security Group requirements. FERC completes Project Security Memorandum for all PG&E Security Group 1 and 2 dams. As part of this memorandum, a security checklist is provided that includes security recommendations to improve PG&E's security program to meet the FERC requirement.

The overall scope of the FERC Security Improvements (FSI) Program is to provide consistent execution of projects created to address physical security recommendations from FERC and Corporate Security (CSD). Physical security elements addressed by this program are expected to include:

- Gates and Fencing
- Signage
- Lighting and Video Surveillance
- Intrusion Detection and Access Control
- Architectural Hardening

This program does not include cybersecurity elements of compliance outside of the physical security features used to protect critical and operational cyber assets, does not address development or updates to response and recovery plans, and does not directly seek to reduce the vulnerability of projects, however, does recognize reduction inherent in the application of additional physical security features.

Power Generation will safely implement over 1,200 documented regulatory recommendations and internal compliance requirements through 167 individual projects to reduce the relative risk of PG&E Hydropower FERC Projects starting in January 2024 with last release to operations in December 2032 and completing the program closeout by June 2033.

At Electra Powerhouse (PH), the project will replace existing security fencing and gates to reduce the risk of unauthorized personnel from accessing the powerhouse, switchyard, and equipment furthermore protecting PG&E critical assets. Implementing these security measures at the Electra PH enhances safety and security by ensuring that PG&E adequately adheres to FERC recommendations and corporate security standards.

At Rock Creek fencing will be replace existing fencing as well as add fencing to vulnerable access points and assets (main entrance, intake area, fence along Rock Creek Road, low-level outlet area and north access road) identified in the security assessment. In addition, the project will add a vehicle gate, high security locks and additional fencing to prevent unauthorized access from the north embankment.

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Justification

FERC requires licensees to conduct vulnerability assessments and/or security assessments to identify potential threats and vulnerabilities along with recommendations to address them. These assessments, along with FERC inspections, have resulted in over 1,200 documented recommendations across all PG&E watersheds. Failure to implement these recommendations can result in verbal guidance or warnings, written warnings, violation letters, issuance of compliance orders, license revocation and/or the issuance of penalties. The program implements risk mitigation strategies developed in the 2024 Risk Assessment and Mitigation Phase (RAMP) report for a Large Uncontrolled Water Release (LGUWR) driven from a physical attack. Projects created under this program align with risk mitigation program LGUWR-M005. This Program is a direct result of Foundation Activity, LGWUR-F002, to create a Security Program that provides a plan for implementing physical security projects.

The program will provide modernization and increased network capabilities for PGEN assets. An evaluation of existing Information Technology (IT) infrastructure, design for increased bandwidth and transmission capabilities, and implementation of a consistent network model are required to provide the surveillance needed to meet regulatory requirements and protect PG&E critical infrastructure.

PG&E received a letter, dated September 14, 2022, from FERC, identifying Electra PH as an at-risk facility requiring physical security. PG&E subsequently hired a consultant (Blair, Church & Flynn (BCF)) to review site conditions, obtain photographs, discuss proposed design improvements, and incorporate FERC recommendations. Their recommendations included replacing the existing chain link perimeter fences and gates with a high-security alternative meeting PG&E's corporate security standard SEC-2010S.

In 2011, FERC provided security-related recommendations for Rock Creek dam based on a site-specific vulnerability assessment. Subsequently, PG&E's Power Generation FERC Security Improvements (FSI) program issued recommendations for installation of onsite security measures in order to comply with FERC's recommendations and conform to PG&E Utility Standard: SEC-2010S 'Enterprise Perimeter Barrier and Fencing Standard' (Ref. 2). The scope of this project addresses vulnerable access points and assets with the installation of a new security fence and gate.

The CBR for LGUWR-M005 is 0.002. PG&E's risk mitigation strategies are selected to ensure that safety remains PG&E's top priority even when the quantitative modelling indicates the costs are higher than the modeled value of risk reduction**.** Other factors are considered when selecting mitigations, including the following:

PG&E dams are regulated by two governmental agencies: FERC per CFR Title 18 - Conservation of Power and Water Resources, Part 12 - Safety of Water Power Projects and Project Works, and DSOD per CCR Title 23 - Waters. PG&E is responsible for meeting compliance requirements and obligations to ensure its dams and associated components meet design requirements and can be operated in a reliable and safe manner. For example, dams are required to safely pass the design storm flows and not fail catastrophically for earthquakes up to the design load. Critical components such as spillway gates and LLOs, along with their power supply and backups, need to be operational during dam safety emergencies and routine operations.

Power Generation follows industry best practices as identified in the ISO 55001 certification that it achieved in March 2022. These practices include a prudent risk-informed asset management approach to managing asset

risk through the asset lifecycle. Absent longer term, steady state funding cycles, a serious safety or reliability incident will likely occur in the future.

The LGUWR bow tie model does have limitations. For example, significant deficiencies identified by our regulators that are not satisfactorily mitigated in a timely manner could result in revoking of license and a halt in operations.

All projects within the LGUWR-M005 – Physical Security are essential in ensuring the long-term safe and reliable operations of PG&E dams and are directed at preventing a large uncontrolled water release incident.

Cost

Individual project costs are forecasted upon recent similar project experience and extrapolated for project category and size. All costs are provided at an AACE Class 4 estimate with 15% contingency.

Major Project Spending Estimates
(Thousands of Nominal Dollars)

CAPITAL/EXPENSE

Planning Order	Description	CBR[3]	Operative Date	2024 CWIP	2025 Forecast	2026 Forecast	2027 Forecast	2028 Forecast	2029 Forecast	2030 Forecast	CWIP + 2025 - '30 Total
5047178	FERC Security Plan	Foundational	n.a.	n.a.	375	384	1,800	n.a.	n.a.	n.a.	**2,559**
5280552	FERC Security Improv FSI - Desabla - Exp	n.a.	n.a.	n.a.	250			n.a.	n.a.	n.a.	**250**
5280553	FERC Security Improv FSI - ML - Exp	n.a.	n.a.	n.a.	100			n.a.	n.a.	n.a.	**100**
5280554	FERC Security Improv FSI - Drum - Exp	n.a.	n.a.	n.a.	100			n.a.	n.a.	n.a.	**100**
5280555	FERC Security Improv FSI - Southern- Exp	n.a.	n.a.	n.a.	100			n.a.	n.a.	n.a.	**100**
5280556	FERC Security Improv FSI - Shasta - Exp	n.a.	n.a.	n.a.	100			n.a.	n.a.	n.a.	**100**
5287453	FERC Security Improvements FSI - Exp	n.a.	n.a.	n.a.			1,220	n.a.	n.a.	n.a.	**1,220**
5279992	FERC Security Improvements – NEE	n.a.	n.a.	n.a.	1,000	1,000		n.a.	n.a.	n.a.	**2,000**
5792732	Rock Crk Rsvr Upgr Fencing and Gates FSI	n.a.	December 2025	3,107	311						**3,419**
5792753	Pit 3 Lk Britton Dam Inst Video Monitor	n.a.	October 2026	13	-	543					**557**
5802886	Lake Almanor Spillway Install Fence FSI	n.a.	October 2026		150	595					**745**
5804599	Relief Dam Inst V. Surv/Sec Cams FSI	0.002	November 2027	1	50	236	837	34			**1,158**
5804600	Relief Dam Fencing & Barrier Upgrade FSI	n.a.	December 2025		284						**284**

[3] CBRs are only provided for LGUWR mitigation or control projects with operative dates and/or costs within the 2027-2030 GRC period and beyond. CBRs are not calculated for programs with pre 2027 operative dates.

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Planning Order	Description	CBR[3]	Operative Date	2024 CWIP	2025 Forecast	2026 Forecast	2027 Forecast	2028 Forecast	2029 Forecast	2030 Forecast	CWIP + 2025 - '30 Total
5804963	Tiger Crk Reg Dam Inst V.Surv/SecCamsFSI	n.a.	October 2026			542	35				**577**
5805018	Tiger Crk ABay Upgr Security Fencing FSI	n.a.	October 2026			772					**772**
5805019	Tiger Crk Abay Inst V. Surv/Sec Cams FSI	n.a.	October 2026			594					**594**
5805998	Belden Dam Install Cameras FSI	0.0003	October 2028	121	212	135	36	844	53		**1,401**
5805999	Bucks Lake Dam Inst Video Surv Upgr FSI	0.01	August 2028				289	807	39		**1,135**
5806000	Butt Valley Dam Inst Video Surv FSI	n.a.	November 2026		296	707	35				**1,038**
5806001	Cresta Dam Inst V. Surv/Sec Cameras FSI	n.a.	October 2026	227	349	152					**728**
5806002	Grizzly Dam Inst Video & Sec Upgr FSI	0.002	August 2028				289	807	39		**1,135**
5806003	Lake Almanor Dam Inst Video&Sec Upgr FSI	n.a.	December 2026		396	683	35				**1,115**
5806004	Lwr Bucks Dam Inst Video & Sec Upgr FSI	0.001	September 2028				289	807	39		**1,135**
5806005	Rock Creek Dam Inst Video & Sec Upgr FSI	n.a.	October 2026	212	1,177	169					**1,568**
5806063	Pit 1 Fbay Inst V. Surv/Sec Cameras FSI	0.001	December 2027	232	220	-	749	43			**1,243**
5806064	Pit 1 Forebay Install Fencing FSI	0.002	October 2027		50	125	1,088				**1,263**
5806066	Pit 3 Lk Britton Inst V.Surv/Sec Cam FSI	0.007	December 2027	63	593	68	924	29			**1,678**
5806068	Pit 4 Div Dam Inst Cameras and IDS FSI	0.002	May 2028				289	807	39		**1,135**
5806070	Pit 5 Open Conduit Install Fencing FSI	0.005	May 2028				36	126	269		**432**
5806071	Pit 5 Dam and OC Install Cameras FSI	0.0005	May 2028				36	278	915	35	**1,265**
5806120	Salt Spgs Dam Inst V. Surv/Sec Cams FSI	0.001	December 2028	54	296	-	289	807	39		**1,485**
5806621	Courtright Dam Video Surv Upgrade FSI	0.002	November 2027	13	-	307	1,092	45			**1,457**
5806622	Wishon Dam Inst Video Surv/Security FSI	0.003	November 2027	10	-	328	1,092	46			**1,475**
5806623	Courtright Comm Twr Inst V. Surv/Sec FSI	0.002	December 2028	14	-	-	377	1,053	51		**1,495**
5808254	CV Dam Fencing Upgrade FSI	0.002	November 2028				153	1,049			**1,202**
5808255	CV Dam Video Surveillance Upgrade FSI	0.001	November 2028				289	807	39		**1,135**
5808256	Drum Fbay Dam Install Cameras FSI	0.00002	October 2029				36	278	915	35	**1,265**
5808257	Lake Almanor Intake Inst Sec Upgr FSI	0.010	August 2028				109	317	40		**466**

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Planning Order	Description	CBR[3]	Operative Date	2024 CWIP	2025 Forecast	2026 Forecast	2027 Forecast	2028 Forecast	2029 Forecast	2030 Forecast	CWIP + 2025 - '30 Total
5808318	Lake Fordyce Install Cameras FSI	0.009	December 2032						40	284	**324**
5808319	Lake Valley Dam Install Cameras FSI	0.001	October 2028			34	289	807	39		**1,169**
5808320	Lower Bucks Lake Dam Install Fencing FSI	0.004	October 2028				153	1,049			**1,202**
5808321	Manzanita Dam Fencing Upgrade FSI	0.00003	December 2031						168	1,072	**1,239**
5808322	Manzanita Dam Video Surv Upgrade FSI	0.000008	December 2031						316	825	**1,140**
5808323	PV Scott Dam Install Cameras FSI	0.0002	December 2032						316	825	**1,140**
5808324	PV Scott Dam Install Fencing Upgrade FSI	0.0007	December 2032						168	1,072	**1,239**
5808325	Rock Creek Dam Desabla Inst Fencing FSI	0.004	December 2028	30	-	-	153	1,049			**1,233**
5808326	Rock Crk Inst Video & Security Upgr FSI	0.001	December 2028		51	267	837	34			**1,189**
5808327	Rucker Lake Dam Install Cameras FSI	0.000002	October 2031					35	316	825	**1,176**
5808328	Rucker Lake Inst Fencing and Gate FSI	0.000009	October 2031					35	168	1,072	**1,275**
5808329	Spaulding Dam 1 Install Cameras FSI	0.003	October 2028			34	289	807	39		**1,169**
5808330	Spaulding Dam 2 Install Access Gates FSI	0.001	October 2027		15	142	1,088				**1,245**
5808331	Spaulding Dam 2 Install Cameras FSI	0.0005	September 2028			34	289	807	39		**1,169**
5808332	Upper Peak Lake Dam Install Cameras FSI	0.00005	August 2029				36	278	915	35	**1,265**
5808333	Upper Peak Lake Upgrade Fencing FSI	0.002	August 2029				36	148	1,189		**1,374**
5808334	Wise Fbay Inst Video & Security Upgr FSI	0.00008	October 2030					35	316	825	**1,176**
5808335	Belden Dam Intake Bldg Fencing FSI	0.001	December 2030	24	-	-	-	11	168	928	**1,130**
5808338	Halsey Fbay Dam Install Cameras FSI	0.0009	December 2028				289	807	39		**1,135**
5808339	Lake Almanor LLO Fencing FSI	n.a.	October 2026	17	150	595					**763**
5808340	Lk Tabeaud Dam Inst V. Surv/Sec Cams FSI	0.0001	November 2029				36	278	915	35	**1,265**
5808341	Macumber Dam Inst Video & Sec Upg FSI	0.000008	August 2029				36	278	915	35	**1,265**
5808342	Macumber Install Fencing FSI	0.00003	August 2029				36	148	1,189		**1,374**
5808343	Cresta Dam Install Fencing FSI	0.002	December 2028	28	-	-	153	1,049			**1,232**
5808931	Butt Valley Spillway Fencing FSI	0.003	December 2030	18	-	-	-	14	218	1,398	**1,648**
5808932	Butt Valley Prattville Intk	0.008	December	18	-	-	-	14	186	317	**534**

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Planning Order	Description	CBR[3]	Operative Date	2024 CWIP	2025 Forecast	2026 Forecast	2027 Forecast	2028 Forecast	2029 Forecast	2030 Forecast	CWIP + 2025 - '30 Total
	Fencing FSI		2030								
5808945	Lwr Bear Dam Inst Video Surv/SecCams FSI	0.005	October 2029				36	278	915	35	**1,265**
5808948	Strawberry Dam Inst V. Surv/Sec Cams FSI	0.0002	October 2029				36	278	915	35	**1,265**
5806121	Salt Spgs PH Inst V. Surv/Sec Cams FSI	n.a.	December 2029	21	230	-	-	278	915	35	**1,480**
5808943	Electra PH inst Video Surv/Sec Cams FSI	n.a.	December 2027		150	60	1,169	24			**1,403**
5808944	Tiger Creek PH Inst V. Surv/Sec Cams FSI	n.a.	June 2029				36	235	1,279		**1,550**
5808990	Electra PH Upgrade Sec Fencing FSI	n.a.	December 2025	971	886						**1,857**
5809498	Strawberry Dam Fencing Upgrade FSI	0.0009	November 2029				36	148	1,189		**1,374**
5809922	Salt Springs Dam Upgrade Sec Fencing FSI	0.005	December 2028	36	210	-	153	1,049			**1,449**
5811780	Lake Tabeaud Dam Upgrade Sec Fencing FSI	0.0004	June 2029				36	148	1,189		**1,374**
5812255	Spaulding Dam 2 Upgrade Fencing FSI	0.001	October 2027		15	142	1,088				**1,245**
5812256	Spaulding Dam 1 Upgrade Fencing FSI	0.011	October 2027		30	142	1,088				**1,260**
5812264	Drum Fbay Dam Upgrade Fencing FSI	0.0001	October 2027		50	142	1,088				**1,280**
5812284	Lake Fordyce Dam Upgrade Fencing FSI	0.009	August 2029				36	148	1,189		**1,374**

Benefits

The projects provide an adequate level of security for PG&E assets in compliance with FERC's security recommendations.

Alternatives Considered

Status Quo: Do nothing - This alternative assumes that no action is taken to comply with the FERC security recommendations. This results in security vulnerabilities that could put PG&E's generation assets and water delivery obligations at risk.

Alternative 1: FERC Security Improvements Program– This is the recommended alternative and complies with the FERC security recommendations.

Alternative 2: Delay Program one year - This alternative has the same long-term benefits as the recommended alternative; however, in the short-term, this alternative is not recommended for the reasons stated in the Status Quo alternative.

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Project Summary

Project Title: Fordyce Dam Projects

Major Work Categories: 2L, 2N
Planning Order Numbers: 5745679, 5810107, 5810108, 5780885
Project Start Date: 2016
Project Completion Date: December 2031
Operative Date: Various

Project Description

Lake Fordyce Dam is a concrete-faced earth fill and rockfill dam that was constructed in stages between 1873 and 1926. The dam has a long history of seepage from the downstream toe. The level of observed seepage would not generally be concerning for a rockfill-only embankment; however, Lake Fordyce dam contains, as a remnant of its early construction phases, a zone of erodible soil in the upstream toe. Erosion of this material by seepage flowing through the dam could result in cracking and damage to the upstream concrete facing, resulting in an uncontrolled release of water.

Previous seepage mitigation efforts at the dam have concentrated on the upper, more accessible part of the dam's concrete liner and have generally had only limited and temporary success. In 2005 a maximum seepage threshold of 30 cubic feet per second (cfs) was established by the State of California Department of Water Resources - Division of Safety of Dams (DSOD) as a trigger to initiate further seepage mitigation measures. This level was exceeded in 2008. Repairs to the upper liner in 2009 and 2010 have stabilized the seepage level but have not brought it below 30 cfs. DSOD has indicated to PG&E that conducting repairs to the upper liner without also addressing seepage through the upstream toe and lower portion of the dam may no longer be considered sufficient.

In 2016, PG&E completed a seepage stability analysis and conducted a Probable Failure Mode Analysis (PFMA) workshop with DSOD. The workshop conclusion was that there was no immediate risk of dam failure, however, PG&E is required to design and construct seepage control measures to stabilize seepage through the toe. DSOD has authorized several extensions of their deadline for seepage mitigation so that PG&E could collect data and review the findings with technical experts. At 50% design, a consensus was reached between PG&E, the Federal Energy Regulatory Commission (FERC) and DSOD that the approach was appropriate and PG&E approved funding to being construction in 2021.

Construction did start in 2021, however due to Cofferdam design issues encountered, construction was paused in 2021, and the Cofferdam underwent significant redesign. After completion of the cofferdam redesign, construction commenced again in June 2024 with a new Prime Contractor, Walsh Construction (Walsh). Walsh successfully completed the construction of the Cofferdam in 2024.

Given the elevation of the dam at 6,342ft, construction can only occur on the project during the summer months, weather permitting. It is anticipated that it will take a minimum of three construction seasons and a maximum of six, to complete the construction on Fordyce Dam.

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This project will reduce the seepage amount and potential for embankment erosion by making improvements to the lower part of the dam (the dam's upstream "toe"), where it is estimated that most of the seepage originates, by installing a CARPI liner and grouting around the low-level outlet (LLO). The CARPI system is a patented system for waterproofing and draining the upstream face of all types of dams and providing protection from the deterioration phenomena caused by seepage of reservoir water into requirements.

The year following the completion of the leakage reduction project at Fordyce, PG&E will install new needles and guard valves to improve the LLO operation. A bypass line upstream of the guard valve can be installed during the Fordyce work planned for 2024-2029. This will allow replacement of the LLO needle valve while maintaining an instream flow release. Structural improvements include repairing wall cracks and wall spalling. Electrical improvements include installing an electrical panel so a portable generator can be plugged in and new wiring and conduits for the new valves.

The objective of the project is to improve the reliability of the LLO valve at Fordyce Dam so the reservoir can be drained during a dam emergency. This is a dam safety & public safety project.

Justification

DSOD has mandated that the long-term leakage rate below Fordyce Dam be reduced to less than 30 cfs. The Fordyce Dam leakage reduction project was forecast in previous GRCs. Work began in 2016, but the scope of the project has changed from the 2017 GRC based on the PFMA workshop with DSOD. The work was forecast for completion in 2025 in the 2023 GRC, but the work is now forecast for completion in 2029.

Based on a visual inspection performed in 2017, the LLO and guard valves at Fordyce Dam are worn and need replacement due to aging, deterioration, and wear and tear which has resulted in cohesion and sticking. The butterfly and needle valves are unreliable, and they have had difficulty operating over recent years. Additionally, the current condition does not allow the flexibility to cycle the valve as needed during the run-off season. If the valves were to fail, the area downstream of the dam could be impacted resulting in protected species habitat damage. Also, there are public campgrounds downstream of the dam, if the valves were to fail due to the malfunction of the LLO and guard valves, there is a significant risk to the public directly downstream. Moreover, if water restrictions are placed on the reservoir by a regulating agency, a reduction in generation may occur at downstream powerhouses.

Additionally, these projects are mitigations to the Large Uncontrolled Water Release Risk (LGUWR). More specifically, these projects are part of the Internal Erosion (LGUWR-M001 – Internal Erosion) and Low-level Outlet (LLO) (LGUWR-M004 – LLO Refurbishments) mitigation projects included in PG&Es 2024 Risk Assessment and Mitigation Phase (RAMP) filing.

The CBR for LGUWR-M001 is 0.3. The CBR for LGUWR-M004 is 3.3. PG&E's risk mitigation strategies are selected to ensure that safety remains PG&E's top priority even when the quantitative modelling indicates the costs are higher than the modeled value of risk reduction**.** Other factors are considered when selecting mitigations, including the following:

Compliance Requirements: PG&E dams are regulated by two governmental agencies: FERC per CFR Title 18 - Conservation of Power and Water Resources, Part 12 - Safety of Water Power Projects and Project Works, and DSOD per CCR Title 23 - Waters. PG&E is responsible for meeting compliance requirements and obligations to ensure its dams and associated components meet design requirements and can be operated in

a reliable and safe manner. For example, dams are required to safely pass the design storm flows and not fail catastrophically for earthquakes up to the design load. Critical components such as spillway gates and LLOs, along with their power supply and backups, need to be operational during dam safety emergencies and routine operations. PG&E is responsible for maintaining the LLOs as required by the PG&E Dam Safety Program. This program is mandated by Federal and State regulators and compliance requirements which aligns with the requirement to maintain operational capacity to operate the dam safely to prevent harm to public and environmental resources. This program is part of PG&E's Dam Safety Program, Safe Dam Operating Capacity Metric and follows the FERC engineering guidelines and DSOD requirements.

Operational and Executional Considerations: Power Generation follows industry best practices as identified in the ISO 55001 certification that it achieved in March 2022. These practices include a prudent risk-informed asset management approach to managing asset risk through the asset lifecycle. Absent appropriate funding to ensure continued risk reduction and prevention, a serious safety or reliability incident will likely occur in the future. The investments needed to retrofit the dams and components to meet design requirements or for upkeeping do not always have CBR scores greater than one. In general, mitigation projects that are large, complex, and require multiyear design and construction tend to have lower CBRs because of the higher implementation costs.

CBR/Bow Tie Modeling Limitations or Uncertainties: The risk reduction may be underestimated due to data and modeling limitations. An example of such a limitation is that significant deficiencies identified by our regulators that are not satisfactorily mitigated in a timely manner could result in revoking of license and a halt in operations. This is difficult to quantify and currently not captured in the risk modeling.

All projects within the LGUWR-M001 – Internal Erosion Mitigations and LGUWR-M004 – LLO Refurbishments are essential in ensuring the long term safe and reliable operations of PG&E dams and are directed at preventing a large uncontrolled water release incident.

Cost

The cost assumptions for this project are based on professional judgment and historic PG&E cost data for similar work.

The total project expected case forecast for the Fordyce Dam Leakage Reduction is currently $237.5 million, which is $143.7 million higher than the expected case estimate prepared during the 2023 GRC.

The following cost drivers are the reasons for the increase in cost between the 2023 and 2027 GRCs:

Construction Contract & Materials ($116.6M) – Main drivers include market changes due to rebidding the project five years after the original bid and contractor supply and demand, escalation and inflation for labor rates and material prices, better understanding of the scope and schedule constraints by bidders resulting in appropriate contractor staffing, resources, and risk contingencies.

Labor ($16.8M) – The engineering team spent a considerable amount of time reviewing the new cofferdam design and obtaining FERC, DSOD and Board of Consultants (BOC) approvals. The cost also includes a PG&E Land Planner leading the environmental permitting discussions with the agencies, a construction manager, site support, project management, and engineering.

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Increased Risk Allocation ($23.0M) – Results of a 2019 in-lake geotechnical investigation at the toe of the dam and along the proposed alignment of the cofferdam and cutoff indicate potential increased complexity and an increase in the quantity of material. These risks have impacted construction costs and have significantly increased the return to service milestone date. Additional lessons learned since previous construction are also added.

Engineering & Permitting Contracts ($26.1M) – Due to the original Cofferdam design issues, the project team elected to use a conventional, industry-proven rockfill Cofferdam design. Cofferdam design changes resulted in the need to amend several permits. A third-party cost and constructability consultant was retained to prepare cost and schedule estimates and assist with construction bid reviews. The cost also includes an additional year of construction support from an engineering consultant.

AFUDC Increase ($55.0M) – Original expected case assumed three seasons for construction with two contingency seasons with anticipated release to operations in November 2025. The proposed expected case assumes four seasons for construction with two contingency seasons with anticipated release to operations in November 2029.

Major Project Spending Estimates
(Thousands of Nominal Dollars)

CAPITAL

Planning Order	Description	CBR[4]	Operative Date	2024 CWIP	2025 Forecast	2026 Forecast	2027 Forecast	2028 Forecast	2029 Forecast	2030 Forecast	CWIP + 2025 - '30 Total
5810108	Fordyce Dam Install Carpi Liner	n.a.	October 2026	4,008		21,099					**25,107**
5810107	Fordyce Dam Install Plinth	n.a.	December 2025	8,279	40,552						48,801
5745679	Fordyce Dam Leakage Reduction DOE	0.6	October 2029	61,509	7,840	10,870	11,138	15,441	10,850		117,649
5780885	Fordyce Dam Replace LLO and Guard Valves	3.4	December 2029	1,874		333	773	6,619	1,080	300	10,980

Benefits

This project is required to comply with DSOD requirements and will reduce the risk of dam failure which would disrupt power production, water delivery and would likely have severe environmental impacts and potentially public safety impacts.

The Fordyce Dam Leak Reduction project is a mitigation to the large uncontrolled water release risk. More specifically, this project is an internal erosion mitigation (LGUWR-M001 – Internal Erosion Mitigations). PG&E implements internal erosion mitigations (LGUWR-M001) to minimize the potential for internal erosion failure modes to initiate and develop for earth fill and rockfill embankment dams. Implementing LGUWR-M001 mitigation projects will reduce the likelihood of the D3 (failure under normal operations) risk driver for this dam but does not change the safety and financial consequences in an event of dam failure.

[4] CBRs are only provided for LGUWR mitigation or control projects with operative dates and/or costs within the 2027-2030 GRC period and beyond. CBRs are not calculated for programs with pre 2027 operative dates.

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The Fordyce Dam Replace LLO and Guard Valves is a mitigation to the large uncontrolled water release risk. More specifically, this project is an internal erosion mitigation (LGUWR-M004 – LLO Refurbishments). PG&E implements LLO refurbishments (LGUWR-M004) to ensure the reservoir can be drained during an emergency or for dam maintenance. LLOs do not directly mitigate the three major drivers (flood, seismic, and normal) but maintaining reliable operation of the LLOs is critical to lower the reservoir after a seismic event or during the progression of internal erosion failure modes to prevent a more catastrophic failure.

Alternatives Considered

Status Quo – Continue to evaluate but make no repairs or investments. This alternative is not responsive to mandatory DSOD requirements and does not address potential risk of failure.

Alternative 1: Fordyce Dam projects – This entails installing a cofferdam, a carpi liner on the upstream surface of the dam, and a plinth on the abutment to prevent further erosion of the dam footing. As well as replacement of the LLO needle valve while maintaining an instream flow release This is the recommended alternative.

Alternative 2: Partial or full draining of Fordyce reservoir – This alternative reduces the risk of dam failure but results in lost generation, as well as environmental and water storage consequences.

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Project Title: Large Uncontrolled Water Release Foundational Activities

Major Work Categories: AX, 2L, 2N, IG, KJ
Planning Order Numbers: See table below
Project Start Date: Various
Project Completion Date: Various
Operative Date (only applies to Capital): Various

Project Description

PG&E's Power Generation Organization's foundational activities are essential in managing the LGUWR risk and enabling its controls and mitigations, as well as compliance with FERC and DSOD regulations. Emergent deficiencies that could impact dam safety found by these foundational activities will be acted upon accordingly, either through additional foundational studies to better understand the deficiency, implementation of IRRMs, and/or permanent risk reduction projects. If needed, PG&E may implement additional inspection, surveillance, and monitoring activities until the emergent deficiencies are mitigated, either through revised operational procedures, and/or risk reduction projects. PG&E's Dam Safety Program, along with Asset Management and O&M, manages and implements foundational activities to include the additional risk analysis for all 164 dams.

Justification

These projects are foundational in managing the large uncontrolled water release (LGUWR) risk. More specifically, these projects are part of the Dam Safety Program (LGUWR-F001– Dam Safety Program) foundational projects included in PG&Es 2024 Risk Assessment and Mitigation Phase (RAMP) filing.

All projects within the LGUWR-F001 – Dam Safety Program are essential in ensuring the long-term safe and reliable operations of PG&E dams and are directed at preventing a large uncontrolled water release incident.

Cost

The cost assumptions for these projects are based on professional judgment and historic PG&E cost data for similar work.

Major Project Spending Estimates
(Thousands of Nominal Dollars)

CAPITAL

Planning Order	Description	Operative Date	2024 CWIP	2025 Forecast	2026 Forecast	2027 Forecast	2028 Forecast	2029 Forecast	2030 Forecast	CWIP + 2025 - '30 Total
5778271	Lake Almanor Automate Instrumentation	December 2026	746		830	38				**1,614**
5778272	Butt Valley Dam Automate Instrumentation	October 2027	739		27	1,746				**2,512**
5782995	Philbrook Dam Install New Weir	December 2025	707	1,552						**2,258**
5792676	Rock Creek Dam Replace Stilling Wells	December 2027	392	105	80	1,425	28			**2,031**
5793584	Halsey Abay Dam Inflow Design Flood-Eval	December 2027	4			95				**100**
5802598	Pit 3 Britton Dam Install EAP PROC Alarm	December 2026	100		645					**745**

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Project Summary

Planning Order	Description	Operative Date	2024 CWIP	2025 Forecast	2026 Forecast	2027 Forecast	2028 Forecast	2029 Forecast	2030 Forecast	CWIP + 2025 - '30 Total
5802829	Wishon Dam Install Seismic Monitoring	September 2027				21				**21**
5802830	Courtright Dam Seismic Monitoring	October 2027				119				**119**
5811973	Iron Canyon Dam Inst Instru ADAS	December 2032							234	**234**
5811974	Pit 7 Dam Inst Instru ADAS	December 2032							234	**234**
5811975	Pit 1 Dam Inst Instru ADAS	December 2032							234	**234**
5811976	Pit 6 Dam Inst Instru ADAS	December 2032							234	**234**
5812319	Cresta Dam Inst Instru ADAS	December 2030							234	**234**
5812328	Philbrook Dam Inst Instru ADAS	December 2030							234	**234**
5812331	Rock Creek Dam Inst Instru ADAS	December 2030							234	**234**

EXPENSE

Planning Order	Description	2025 Forecast	2026 Forecast	2027 Forecast	2025-2027 Forecast
5001043	DSP: Required Facility Safety Program	725	575	2,722	**4,022**
5004009	DSP: FSP Instrumentation/Mntrng/Rprtng	400	300	200	**900**
5010029	DSP: Helms Req Facility Safety Program	1,050	1,044	1,045	**3,139**
5010030	DSP: KCV Req Facility Safety Program	1,150	1,087	1,090	**3,327**
5010031	DSP: MTL Req Facility Safety Program	1,125	1,668	5,112	**7,905**
5010032	DSP: Drum Req Facility Safety Program	1,325	1,458	4,601	**7,384**
5010033	DSP: Potter Valley Req Facility Safety	1,024	1,048	1,078	**3,151**
5010034	DSP: Shasta Req Facility Safety Program	2,400	4,000	5,296	**11,696**
5010035	DSP: DeSabla Req Facility Safety Program	2,900	1,718	1,224	**5,842**
5021709	AM: Dam Safety Program (IRIS Damwatch)	466	477	491	**1,435**
5054251	DSP: Surveillance Programs	408	417	429	**1,254**
5054252	DSP: Gates and Valves Program	518	531	545	**1,594**
5272077	DSP: Inundation Maps	500	500	3,000	**4,000**
5281832	DSP: Seismic Risk Studies (NEE)	450	461		**911**
5281833	DSP: Flood Risk Program (NEE)	150	150		**300**
5281834	DSP: Risk Consequence Program (NEE)	150	150		**300**
5285452	DSP: Seismic Risk Studies (EIE)				
5285453	DSP: Risk Consequence Program (EIE)				
5286997	AM: Dam Asset Risk Analysis			400	**400**
5287170	AM: Insp & Surv Program – Dam Face US&DS			950	**950**
5287172	AM: L1RA portfolio risk			500	**500**
5287534	DSP: Comprehensive Assessments		950		**950**

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Benefits

- Manage the LGUWR risk and enable its controls and mitigations, as well as compliance with FERC and DSOD regulations.
- Emergent deficiencies that could impact dam safety found by these foundational activities will be acted upon accordingly, either through additional foundational studies to better understand the deficiency, implementation of IRRMs, and/or permanent risk reduction projects.

Alternatives Considered

Status Quo: Do Nothing – This alternative is not recommended. This alternative is not responsive to mandatory DSOD and License requirements and does not address the potential risk of failure.

Alternative 1: Implement Large Uncontrolled Water Release Foundational Activities- This is the recommended alternative. This alternative enables PG&E to manage the LGUWR risk and enable its controls and mitigations, as well as compliance with FERC and DSOD regulations.

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Project Title: Helms Replace Courtright LLO Bypass Valve

Major Work Categories: 2N
Planning Order Numbers: 5779207
Project Start Date: 2021
Project Completion Date: 2026
Operative Date (only applies to Capital): December 2025

Project Description

Helms is located east of Fresno on the North Fork of the Kings River. The system includes two reservoirs, two intake/discharge structures, tunnels, penstocks and the powerhouse.

The low-level outlet (LLO) 24" emergency bypass upstream valve for the Courtright Dam has reached the end of its life expectancy and is currently frozen in the closed position and cannot be operated. Failure of the upstream and downstream valves in the open position will result in an uncontrolled release from Courtright Reservoir.

The project scope is to replace the frozen upstream bypass valve and the redundant downstream valve. While the downstream valve is still operational it is being replaced with a more reliable butterfly valve. Additionally, it is more economical to replace the downstream valve while the equipment and crews are onsite to avoid added mobilization cost. Replacement of these valves will require the use of divers to install a custom line plug to control the flow of water while the valves are out of service.

Justification

The LLO 24” emergency bypass upstream valve is stuck in the closed position and cannot be operated. In addition, water is starting to leak through the top of the valve bonnet. It is critical to complete this project to avoid an uncontrolled water release. Both Division of Safety of Dams (DSOD) and the Federal Energy Regulatory Commission (FERC) are supportive of this project.

Additionally, this project is a mitigation to the large uncontrolled water release (LGUWR) risk. More specifically, this project is a part of the LLO Refurbishment (LGUWR-M004 – LLO Refurbishments) mitigation projects included in PG&Es 2024 Risk Assessment and Mitigation Phase (RAMP) filing. PG&E implements LLO refurbishments (LGUWR-M004) to ensure the reservoir can be drained during an emergency or for dam operation and maintenance. LLOs do not directly mitigate the three major drivers (flood, seismic, and normal) but maintaining reliable operation of the LLOs is critical to lower the reservoir after a seismic event or during the progression of internal erosion failure modes to prevent a more catastrophic failure or to provide water movement during storm event and/or downstream water delivery obligations as a Instream Flow Release(IFR).

The CBR for LGUWR-M004 is 3.3. PG&E’s risk mitigation strategies are selected to ensure that safety remains PG&E’s top priority even when the quantitative modelling indicates the costs are higher than the modeled value of risk reduction**.** Other factors are considered when selecting mitigations, including the following:

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Compliance Requirements: PG&E dams are regulated by two governmental agencies: FERC per CFR Title 18 - Conservation of Power and Water Resources, Part 12 - Safety of Water Power Projects and Project Works, and DSOD per CCR Title 23 - Waters. PG&E is responsible for meeting compliance requirements and obligations to ensure its dams and associated components meet design requirements and can be operated in a reliable and safe manner. For example, dams are required to safely pass the design storm flows and not fail catastrophically for earthquakes up to the design load. Critical components such as spillway gates and LLOs, along with their power supply and backups, need to be operational during dam safety emergencies and routine operations. PG&E is responsible for maintaining the LLOs as required by the PG&E Dam Safety Program and to ensure continued asset ownership and appropriate level of risk management. This program is mandated by Federal and State regulators and compliance requirements which aligns with the requirement to maintain operational capacity to operate the dam safely to prevent harm to public and environmental resources. This program is part of PG&E's Dam Safety Program, Safe Dam Operating Capacity Metric and follows the FERC engineering guidelines and DSOD requirements.

Operational and Executional Considerations: Power Generation follows industry best practices as identified in the ISO 55001 certification that it achieved in March 2022. These practices include a prudent risk-informed asset management approach to managing asset risk through the asset lifecycle. Absent appropriate funding to ensure continued risk reduction and prevention of a serious safety or reliability incident will likely occur in the future. The investments needed to retrofit the dams and components to meet design requirements or for upkeeping do not always have CBR scores greater than one. In general, mitigation projects that are large, complex, and require multiyear design and construction tend to have lower CBRs because of the higher implementation costs.

Bowtie Modeling Limitations: The risk reduction may be underestimated due to data and modeling limitations. An example of such a limitation is that significant deficiencies identified by our regulators that are not satisfactorily mitigated in a timely manner could result in revoking of license and a halt in operations. This is difficult to quantify and currently not captured in the risk modeling.

All projects within the LGUWR-M004 – LLO Refurbishments are essential in ensuring the long-term safe and reliable operations of PG&E dams and are directed at preventing a large uncontrolled water release incident.

Cost

The cost assumptions for this project are based on the professional judgment of the engineers familiar with this type of work, historic PG&E cost data for similar work and secured proposal cost from vendors, constructors, and industry professionals along with estimated installation overheads.

Major Project Spending Estimates
(Thousands of Nominal Dollars)

CAPITAL

Planning Order	Description	CBR	Operative Date	2024 CWIP	2025 Forecast	2026 Forecast	2027 Forecast	2028 Forecast	2029 Forecast	2030 Forecast	CWIP + 2025 - '30 Total
5779207	Helms Repl Courtright LLO Bypass Valve	3.3	December 2025	2,137	511						2,648

Benefits

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Ensures safe operations at Helms by avoiding the possibility of an uncontrolled water release.
Ensures Helms delivers a higher level of power generation reliability resulting from a reduction in forced outages caused by this aging equipment. This results in a replacement power cost savings for customers and customer savings associated with Helms being able to take energy from the CAISO during low priced time periods to pump water allowing Helms to be available to generate during high energy priced time periods.

Alternatives Considered

Status Quo: Do nothing – This alternative is not recommended. This alternative may result in an uncontrolled water release. It also may result in a lower level of power generation reliability resulting from an increase in forced outages caused by this aging equipment. This results in a replacement power costs for customers and additional customer costs associated with Helms being unable to take energy from the CAISO during low priced time periods to pump water and being unable to be available to generate during high energy priced time periods.

Alternative 1: Repair – This alternative is not recommended. The valve is over 40 years old and has reached its end of life. Repairing the valve is not feasible due to the availability of parts.

Alternative 2: Refurbish – This alternative is not recommended as it is far more economical to simply install new valves. Access to the site is very limited so getting the proper tooling and materials to the site for a refurbishment is not feasible. Additionally, it is not common practice in the industry to refurbish these types of valves.

Alternative 3: Replace – This is the recommended alternative. Replacing the valves ensures safe operations at Helms by avoiding the possibility of an uncontrolled water release. This alternative also ensures Helms delivers a higher level of power generation reliability resulting from a reduction in forced outages caused by this aging equipment. This results in a replacement power cost savings for customers and customer saving associated with Helms being able to take energy from the CAISO during low priced time periods to pump water allowing Helms to be available to generate during high energy priced time periods.

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Project Title: Lower Bucks Dam Resurface DS Face

Major Work Categories: 2L
Planning Order Numbers: 5783541
Project Start Date: 1/15/19
Project Completion Date: 6/1/29
Operative Date (only applies to Capital): 10/31/28

Project Description

Lower Bucks Diversion Dam (also known as Bucks Diversion Dam or Lower Bucks Dam) is a 99-foot-tall slender concrete arch dam originally constructed circa 1928. The dam utilizes two ungated spillways; an emergency spillway consisting of five 20-foot overpour bays that spill over the crest of the dam, and a concrete service spillway with a 100-foot ogee crest that spills over the left abutment thrust block of the dam.

Lower Bucks Diversion Dam has severe spalling and surface delamination of concrete on the downstream abutments and downstream face of the dam. The Federal Energy Regulatory Commission (FERC) has asked PG&E to address several follow-up action items from the 2014 Dam Safety/Operation Inspections for the Bucks Creek Hydroelectric Project (FERC Project No. 619-CA). One of these action items is to evaluate the condition of the dam and prepare a repair plan. A structural evaluation of the dam was performed by using current loading criteria and material properties derived from the 2017 concrete test results. The Lower Bucks Dam Resurface Downstream Face project will remediate spalling and surface delamination of concrete which continues to occur on the downstream abutments and downstream face of the Lower Bucks Dam. This project will be constructed over two construction seasons and completed in 2028. There is no impact anticipated on generation to complete this work.

Justification

This project is a mitigation to the large uncontrolled water release (LGUWR) risk. More specifically, this project is part of the Internal Erosion (LGUWR-M001 – Internal Erosion) mitigation program included in PG&Es 2024 Risk Assessment and Mitigation Phase (RAMP) filing. PG&E implements internal erosion mitigations (LGUWR-M001) to minimize the potential for internal erosion failure modes to initiate and develop for earth-fill and rockfill embankment dams. Mitigation projects for LGUWR-M001 include installing a downstream seepage berm with filter and drains and installing or maintaining a seepage barrier on the upstream side of the dam.

The Lower Bucks Dam Resurface Downstream Face project will remediate spalling and surface delamination of concrete which continues to occur on the downstream abutments and downstream face of the Lower Bucks Dam. This project is required to comply with FERC License requirements and will reduce the risk of dam failure which would disrupt power production, water delivery and would likely have severe environmental impacts and potentially public safety impacts.

The CBR for LGUWR-M001 is 0.3. PG&E's risk mitigation strategies and projects within those strategies are selected to ensure that safety remains PG&E's top priority even when the quantitative modelling indicates the costs are higher than the modeled value of risk reduction. Other factors are considered when selecting mitigations, including the following:

Compliance Requirement: PG&E dams are regulated by two governmental agencies: FERC per Title 18 - Conservation of Power and Water Resources, Part 12 - Safety of Water Power Projects and Project Works,

and DSOD per CCR Title 23 - Waters. PG&E is responsible for meeting compliance requirements and obligations to ensure its dams and associated components meet design requirements and can be operated in a reliable and safe manner. For example, dams are required to safely pass the design storm flows and not fail catastrophically for earthquakes up to the design load. Critical components such as spillway gates and LLOs, along with their power supply and backups, need to be operational during dam safety emergencies and routine operations.

Operational and Executional Considerations: Power Generation follows industry best practices as identified in the ISO 55001 certification that it achieved in March 2022. These practices include a prudent risk-informed asset management approach to managing asset risk through the asset lifecycle. Absent appropriate funding to ensure continued risk reduction and prevention, a serious safety or reliability incident will likely occur in the future. The investments needed to retrofit the dams and components to meet design requirements or for upkeeping do not always have CBR scores greater than one. In general, mitigation projects that are large, complex, and require multiyear design and construction tend to have lower CBRs because of the higher implementation costs.

Bowtie Modeling Limitations or Uncertainties: The risk reduction may be underestimated due to data and modeling limitations. An example of such a limitation is that significant deficiencies identified by our regulators that are not satisfactorily mitigated in a timely manner could result in revoking of license and a halt in operations. This is difficult to quantify and currently not captured in the risk modeling.

All projects within the LGUWR-M001 – Internal Erosion Mitigations are essential in ensuring the long-term safe and reliable operations of PG&E dams and are directed at preventing a large uncontrolled water release incident.

Cost

The cost assumptions for this project are based on professional judgment and historic PG&E cost data for similar work.

Major Project Spending Estimates
(Thousands of Nominal Dollars)

CAPITAL

Planning Order	Description	CBR	Operative Date	2024 CWIP	2025 Forecast	2026 Forecast	2027 Forecast	2028 Forecast	2029 Forecast	2030 Forecast	CWIP + 2025 - '30 Total
5783541	Lower Bucks Dam Resurface DS Face	0.002	October 2028	695	773	373	12,002	10,711	260		24,813

Benefits

This project supports compliance with FERC & DSOD regulatory requirements. This project is also a mitigation to the large uncontrolled water release risk. More specifically, this project is an internal erosion mitigation (LGUWR-M001 – Internal Erosion Mitigations). PG&E implements internal erosion mitigations (LGUWR-M001) to minimize the potential for internal erosion failure modes to initiate and develop for earth fill and rockfill embankment dams. Implementing LGUWR-M001 mitigation projects will reduce the likelihood of the D3 (failure under normal operations) risk driver for this dam but does not change the safety and financial consequences in an event of dam failure.

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Alternatives Considered

Status Quo: Do Nothing – This alternative is not recommended. This alternative is not responsive to mandatory DSOD and License requirements and does not address the potential risk of failure.

Alternative 1: Resurface Downstream Face – This is the recommended alternative. This project supports compliance with FERC & DSOD regulatory requirements and mitigates the large uncontrolled water release risk.

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Project Summary

Project Title: McCloud Spillway Improvement

Major Work Categories: 3H
Planning Order Numbers: 5794032
Project Start Date: 2021
Project Completion Date: 2032
Operative Date (only applies to Capital): December 2030

Project Description

The McCloud Dam is located in the Southern Cascade Range in Shasta County, California, on the McCloud River approximately 15 miles south of the town of McCloud, California and was completed in 1965. The Dam is operated by PG&E as part of the McCloud-Pit Hydroelectric Project, Federal Energy Regulatory Commission (FERC) License No. 2106-CA. The Dam is also regulated by the California Department of Water Resources Division of Safety of Dams (DSOD), as State Dam No. 91-123. The Dam is also classified as "High Hazard Potential" under the FERC guidelines.

During the course of several onsite investigations, the existing dam was found to be deficient in size, condition, and design. The course of action to mitigate the deficiencies will involve constructing a new spillway in approximately the same location as the existing spillway, with a wider and deeper spillway crest and chute; providing sufficient capacity to pass the probable maximum flood (PMF) and is in compliance with the regulatory requirements.

Justification

The McCloud Spillway Assessment was performed in response to requests from FERC and DSOD for PG&E to review selected concrete chute-type and unlined spillways in its inventory following spillway-related incidents at Lake Oroville Dam in February 2017.

This project will improve the McCloud Dam Spillway making it capable of passing the PMF of 132,600 cubic feet per second (cfs) to comply with regulatory requirements and increase the safety and reliability of the existing spillway for all flood years.

Additionally, this project is a mitigation to the Large Uncontrolled Water Release (LGUWR) risk. More specifically, this project is part of the Spillway (LGUWR-M002 – Spillway Remediation) projects included in PG&Es 2024 Risk Assessment and Mitigation Phase (RAMP) filing. PG&E is responsible for maintaining the spillways as required by the PG&E Dam Safety Program. This program is mandated by Federal and State compliance requirements which alignments with the requirement to maintain operational capacity to operate the dam safely to keep the public safety and to prevent harm to public and environmental resources. This program follows the FERC engineering guidelines and DSOD requirements.

The CBR for LGUWR-M002 is 1.08. PG&E's risk mitigation strategies are selected to ensure that safety remains PG&E's top priority even when the quantitative modelling indicates the costs are higher than the modeled value of risk reduction. Other factors are considered when selecting mitigations, including the following:

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Compliance: PG&E dams are regulated by two governmental agencies: FERC per Title 18 - Conservation of Power and Water Resources, Part 12 - Safety of Water Power Projects and Project Works, and DSOD per CCR Title 23 - Waters. PG&E is responsible for meeting compliance requirements and obligations to ensure its dams and associated components meet design requirements and can be operated in a reliable and safe manner. For example, dams are required to safely pass the design storm flows and not fail catastrophically for earthquakes up to the design load. Critical components such as spillway gates and LLOs, along with their power supply and backups, need to be operational during dam safety emergencies and routine operations.

Operational and Execution Considerations: Power Generation follows industry best practices as identified in the ISO 55001 certification that it achieved in March 2022. These practices include a prudent risk-informed asset management approach to managing asset risk through the asset lifecycle. Absent appropriate funding to ensure continued risk reduction and prevention, a serious safety or reliability incident will likely occur in the future. The investments needed to retrofit the dams and components to meet design requirements or for upkeeping do not always have CBR scores greater than one. In general, mitigation projects that are large, complex, and require multiyear design and construction tend to have lower CBRs because of the higher implementation costs.

CBR/Bow Tie Modeling Limitations or Uncertainties: The risk reduction may be underestimated due to data and modeling limitations. An example of such a limitation is that significant deficiencies identified by our regulators that are not satisfactorily mitigated in a timely manner could result in revoking of license and a halt in operations. This is difficult to quantify and currently not captured in the risk modeling.

All projects within the LGUWR-M002 – Spillway Remediation mitigations are essential in ensuring the long-term safe and reliable operations of PG&E dams and are directed at preventing a large uncontrolled water release incident.

Cost

Costs were estimated with “like and kind” historical unit cost data from large scale civil construction projects in remote areas. Escalations, risks and contingencies were used to offset unforeseen and unplanned expenses. Cost estimate development was accumulated with input from professional expertise from multiple industry sectors including engineering, environmental, construction and utility industries to capture the full magnitude of expected final costs incurred at completion of the project

Major Project Spending Estimates

(Thousands of Nominal Dollars)

CAPITAL

Planning Order	Description	CBR	Operative Date	2024 CWIP	2025 Forecast	2026 Forecast	2027 Forecast	2028 Forecast	2029 Forecast	2030 Forecast	CWIP + 2025 - '30 Total
5794032	McCloud Spillway Improvements SAIP	0.06	December 2030	17,965	4,503	5,696	8,357	104,660	120,235	124,865	**386,280**

Benefits

FERC License Compliance and DSOD Compliance – This project supports compliance with FERC and DSOD regulatory requirements for flood flows up to the PMF to be safely passed through the spillway in a controlled manner. This is a current need; the spillway does not meet the regulatory requirements in its existing condition

or capacity.

Alternatives Considered

Status Quo: Do nothing – This alternative is not recommended. This alternative does not comply with FERC and DSOD regulatory requirements for flood flows up to the PMF to be safely passed through the spillway in a controlled manner.

Alternative 1: McCloud Spillway Improvements – This is the recommended alternative. This alternative complies with FERC and DSOD regulatory requirements for flood flows up to the PMF to be safely passed through the spillway in a controlled manner. Engineering alternatives were conducted prior to arriving at the proposed alternative. The proposed alternative is to expand and widen the spillway. This hybrid control structure addresses the PMF deficiency while simultaneously expanding the entire spillway to pass the PMF and reduce risks, lower maintenance costs, and regulatory burdens associated with a gated spillway.

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Project Title: Mitigate Internal Erosion

Major Work Categories: 2N
Planning Order Numbers: 5803993, 5806395, 5806781, 5806782, 5809663, 5809987, 5812098, 5812099
Project Start Date: 5803993, 5806395, 5806781, 5806782, 5809663, 5809987, 5812098, 5812099
Project Completion Date: 5803993, 5806395, 5806781, 5806782, 5809663, 5809987, 5812098, 5812099
Operative Date (only applies to Capital): 5806782 - 2029, 5809663 - 2028, 5803993 - 2032, 5812099 - 2027, 5798438 - 2031, 5809987 - 2028, 5806395 - 2030

Project Description

PG&E implements internal erosion measures to minimize the potential for internal erosion failure modes to initiate and develop for earth-fill and rockfill embankment dams. Projects include installing a downstream seepage berm with filter and drains and installing or maintaining a seepage barrier on the upstream side of the dam. PG&E also implements spillway remediation projects to ensure its dams can safely pass the design flood events.
Mitigation projects include improvements to or rehabilitation of spillway control structures, spillway chutes, gates, log booms, and operators. These projects minimize the dam failure under normal operations.

Justification

These projects are mitigations to the large uncontrolled water release (LGUWR) risk. More specifically, these projects are part of the Internal Erosion (LGUWR-M001 – Internal Erosion) or Spillway Remediation (LGUWR-M002) mitigation projects included in PG&Es 2024 Risk Assessment and Mitigation Phase (RAMP) filing. These projects mitigate the risk of dam failure under normal operating conditions.

The CBR for LGUWR-M001 is 0.3. The CBR for LGUWR-M002 is 1.08. PG&E's risk mitigation strategies and projects within those strategies are selected to ensure that safety remains PG&E's top priority even when the quantitative modelling indicates the costs are higher than the modeled value of risk reduction.
Other factors are considered when selecting mitigations, including the following:

Compliance: PG&E dams are regulated by two governmental agencies: FERC per Title 18 - Conservation of Power and Water Resources, Part 12 - Safety of Water Power Projects and Project Works, and DSOD per CCR Title 23 - Waters. PG&E is responsible for meeting compliance requirements and obligations to ensure its dams and associated components meet design requirements and can be operated in a reliable and safe manner. For example, dams are required to safely pass the design storm flows and not fail catastrophically for earthquakes up to the design load. Critical components such as spillway gates and LLOs, along with their power supply and backups, need to be operational during dam safety emergencies and routine operations.

Operational and Execution Considerations: Power Generation follows industry best practices as identified in the ISO 55001 certification that it achieved in March 2022. These practices include a prudent risk-informed asset management approach to managing asset risk through the asset lifecycle. Absent appropriate funding to ensure continued risk reduction and prevention, a serious safety or reliability incident will likely occur in the future. The investments needed to retrofit the dams and components to meet design requirements or for upkeeping do not always have CBR scores greater than one. In general, mitigation projects that are large, complex, and require multiyear design and construction tend to have lower CBRs because of the higher implementation costs.

CBR/Bow Tie Modeling Limitations or Uncertainties: The risk reduction may be underestimated due to data

and modeling limitations. An example of such a limitation is that significant deficiencies identified by our regulators that are not satisfactorily mitigated in a timely manner could result in revoking of license and a halt in operations. This is difficult to quantify and currently not captured in the risk modeling.

All projects within the LGUWR-M001 – Internal Erosion Mitigations and LGUWR-M002 – Spillway Remediation mitigations are essential in ensuring the long-term safe and reliable operations of PG&E dams and are directed at preventing a large uncontrolled water release incident.

Cost

The cost assumptions for these projects are based on professional judgment and historic PG&E cost data for similar work.

Major Project Spending Estimates
(Thousands of Nominal Dollars)

CAPITAL

Planning Order	Description	CBR[5]	Operative Date	2024 CWIP	2025 Forecast	2026 Forecast	2027 Forecast	2028 Forecast	2029 Forecast	2030 Forecast	CWIP + 2025 - '30 Total
5806782	Lower Bear Dam 1 Erosion Protection	0.7	June 2029	8				183	676		**868**
5809663	Lyons Dam Restore Toe Voids	0.003	November 2027	227		72	710	18			**1,028**
5803993	Pit 1 Forebay Dam Restore Upstream Slope	0.04	December 2029	19					681	136	**836**
5806781	Liner Patching 2024	n.a.	December 2025	0	58						**58**
5812098	Relief Dam U/S Liner Patching 2026	n.a.	January 2027			621					**621**
5812099	Relief Dam U/S Liner Patching 2027	0.4	July 2027				761				**761**
5809987	Strawberry Dam Replace Rockfall Netting	0.1	June 2028				143	183			**326**
5806395	Wise FB Install Rip Rap	0.02	December 2029	16				183	1,560	23	**1,783**

Benefits

Mitigates the risk of dam failure due to failure of dam components or internal erosion under normal operating conditions.

Alternatives Considered

Status Quo: Do Nothing – This alternative is not recommended. This alternative is not responsive to mandatory DSOD and License requirements and does not address the potential risk of failure.

Alternative 1: Mitigate Internal Erosion – This is the recommended alternative.

[5] CBRs are only provided for LGUWR mitigation or control projects with operative dates and/or costs within the 2027-2030 GRC period and beyond. CBRs are not calculated for programs with pre 2027 operative dates.

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Project Title: Pit 3 Dam Rest Plunge Pool & Wing Wall

Major Work Categories: 2N **Planning Order Numbers:** 5800748 **Project Start Date:** 2023
Project Completion Date: 2029
Operative Date (only applies to Capital): October 2028

Project Description

The reservoir formed by Pit 3 Dam, has a surface area of 1,265 acres and serves as the forebay for the Pit 3 Powerhouse. Pit 3 Dam is part of PG&E's Pit 3, 4, 5 Hydroelectric Project (FERC Project No. 233) on the Pit River in Northern California. The dam is 494 ft long and 130 ft tall and was constructed between 1923 and 1925. This dam forms Lake Britton which is accessible to the public for fishing, boating, and recreation.

The project will require dewatering of the plunge pool and bypassing the in-flow release (IFR) to address the deficiencies of the plunge pool, wingwalls, and energy-dissipating baffle blocks that were found in the dam inspection. The construction means and methods to address the necessary repairs will be determined during the alternatives analysis and scoping process.

Justification

A third-party firm conducted an inspection of the Pit 3 Dam Spillway Plunge Pool. The inspection found various deficiencies of the spillway, wingwalls, and the energy-dissipating baffle blocks that should be addressed. This project has been established to perform these repairs to address recommendations from the FERC Part 12D safety inspection.

Additionally, this project is a mitigation to the large uncontrolled water release (LGUWR) risk. More specifically, this project is part of the Spillway Remediation (LGUWR-M002 – Spillway Remediation) mitigations included in PG&Es 2024 Risk Assessment and Mitigation Phase (RAMP) filing. PG&E implements Spillway Remediation mitigations (LGUWR-M002) to ensure its dams can safely pass the design flood events. Mitigation projects for LGUWR-M002 include improvements to or rehabilitation of spillway control structures, spillway chutes, gates, log booms, and operators.

The Cost Benefit Ratio (CBR) for LGUWR-M002 is 1.1. The CBR for the Pit 3 Dam Rest Plunge Pool & Wing Wall is 0.002. PG&E's risk mitigation strategies and projects included within those strategies are selected to ensure that safety remains PG&E's top priority even when the quantitative modelling indicates the costs are higher than the modeled value of risk reduction**.** Other factors are considered when selecting mitigations, including the following:

Compliance Requirements: PG&E dams are regulated by two governmental agencies: FERC per Title 18 - Conservation of Power and Water Resources, Part 12 - Safety of Water Power Projects and Project Works, and DSOD per CCR Title 23 - Waters. PG&E is responsible for meeting compliance requirements and obligations to ensure its dams and associated components meet design requirements and can be operated in a reliable and safe manner. For example, dams are required to safely pass the design storm flows and not fail catastrophically for earthquakes up to the design load. Critical components such as spillway gates and LLOs, along with their power supply and backups, need to be operational during dam safety emergencies and routine operations.

Operational and Execution Considerations: Power Generation follows industry best practices as identified

in the ISO 55001 certification that it achieved in March 2022. These practices include is prudent risk-informed asset management approach to managing asset risk through the asset lifecycle. Absent appropriate funding to ensure continued risk reduction and prevention, a serious safety or reliability incident will likely occur in the future. The investments needed to retrofit the dams and components to meet design requirements or for upkeeping do not always have CBR scores greater than one. In general, mitigation projects that are large, complex, and require multiyear design and construction tend to have lower CBRs because of the higher implementation costs.

CBR/Bow Tie Modeling Limitations or Uncertainties: The risk reduction may be underestimated due to data and modeling limitations. An example of such a limitation is that significant deficiencies identified by our regulators that are not satisfactorily mitigated in a timely manner could result in revoking of license and a halt in operations. This is difficult to quantify and currently not captured in the risk modeling.

All projects within the LGUWR-M002 – Spillway Remediations are essential in ensuring the long-term safe and reliable operations of PG&E dams and are directed at preventing a large uncontrolled water release incident.

Cost

Historical data and professional knowledge were used to establish the cost assumptions below.

Major Project Spending Estimates
(Thousands of Nominal Dollars)

CAPITAL

Planning Order	Description	CBR	Operative Date	2024 CWIP	2025 Forecast	2026 Forecast	2027 Forecast	2028 Forecast	2029 Forecast	2030 Forecast	CWIP + 2025 - '30 Total
5800748	Pit 3 Dam Rest Plunge Pool & Wing Wall	0.002	October 2028	214	0	279	407	7,106	26		**8,032**

Benefits

This project is required to comply with DSOD requirements and will reduce the risk of dam failure which would disrupt power production, water delivery and would likely have severe environmental impacts and potentially public safety impacts.

Alternatives Considered

Status Quo: Do Nothing, Run to Failure - This alternative is not recommended. This alternative assumes that no action is taken other than minimal maintenance until an unplanned failure. Deferring work until failure would result in higher costs for emergency repairs and an uncontrolled water release. In an emergency event, there would need to be a way to bypass water, for instance a cofferdam would most likely need to be built. In addition, the lake elevation would need to be lowered, increasing the flow through the IFR valve, possibly creating the need for an emergency license amendment.
Alternative 1: Refurbish/Repair – This is the recommended alternative – Doing this work on a planned basis rather than an emergency basis, results in lower costs to customers.
Alternative 2: Reschedule One Year – This alternative is not recommended. The alternative assumes the project is rescheduled for one year. This alternative will result in further damage and will increase the ultimate repair costs.

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Project Title: Pit 3 LLO Replace No. 1, 2, 3 Actuator
Major Work Categories: 2N **Planning Order Numbers:** 5785096 **Project Start Date:** August 2021
Project Completion Date: Month TBD 2030
Operative Date (only applies to Capital): 12/2029

Project Description

Pit 3 Dam is a hydroelectric dam on the Pit River in Northern California that serves as the primary storage reservoir for the Pit River Hydroelectric system. It was constructed in the mid 1920's and is a concrete gravity structure creating Lake Britton. The low-level outlet (LLO) actuators consist of three separate slide gates each having an invert elevation of 2645.5 ft. The spillway crest is 2732.5 ft. and the normal water elevation for the reservoir is 2738.5 ft, resulting in approximately 93 ft of head on the LLO. The actuators are original equipment, installed in the 1920s. There are currently two issues related to the LLO actuators. First, the slide gate vibrates significantly when operating at mid-range, and second, the gate leaf experiences hydraulic draft forces, which cause the actuator to drift closed when in the fully open position. In addition, the current actuators are hydraulic oil filled and pose an environmental risk of hydraulic fluid entering the Pit River.

Justification

The hydraulic actuators and related control system are original equipment and are over 100 years old. They have reached the end of their useful life. Replacing the actuation system will address the spilling and closing issues. Replacement of the three hydraulic actuators with electric motor operated (EMO) actuators will fix the gate drift issues and eliminate the risk of discharging hydraulic fluid into the water. Data shows the cylinders seals have slowly degraded over time. In the late 1990s operating pressure was 760 PSI with a travel time of seven minutes. Current operating pressure is as low as 480 PSI with an operating time of 22 minutes. Samplings show high levels of lead in the coating in both the inside and outside of the cylinders.

Additionally, this project is a mitigation to the large uncontrolled water release (LGUWR) risk. More specifically, this project is a part of the LLO Refurbishment (LGUWR-M004 – LLO Refurbishments) mitigation projects included in PG&Es 2024 Risk Assessment and Mitigation Phase (RAMP) filing. PG&E implements LLO refurbishments (LGUWR-M004) to ensure the reservoir can be drained during an emergency or for dam operation and maintenance. LLOs do not directly mitigate the three major drivers (flood, seismic, and normal) but maintaining reliable operation of the LLOs is critical to lower the reservoir after a seismic event or during the progression of internal erosion failure modes to prevent a more catastrophic failure or to provide water movement during storm event and/or downstream water delivery obligations as a Instream Flow Release(IFR).

The CBR for LGUWR-M004 is 3.3. PG&E's risk mitigation strategies are selected to ensure that safety remains PG&E's top priority even when the quantitative modelling indicates the costs are higher than the modeled value of risk reduction**.** Other factors are considered when selecting mitigations, including the following:

Compliance Requirements: PG&E dams are regulated by two governmental agencies: FERC per CFR Title 18 - Conservation of Power and Water Resources, Part 12 - Safety of Water Power Projects and Project Works, and DSOD per CCR Title 23 - Waters. PG&E is responsible for meeting compliance requirements and obligations to ensure its dams and associated components meet design requirements and can be operated in a reliable and safe manner. For example, dams are required to safely pass the design storm flows and not fail catastrophically for earthquakes up to the design load. Critical components such as spillway gates and LLOs,

along with their power supply and backups, need to be operational during dam safety emergencies and routine operations. PG&E is responsible for maintaining the LLOs as required by the PG&E Dam Safety Program and to ensure continued asset ownership and appropriate level of risk management. This program is mandated by Federal and State regulators and compliance requirements which aligns with the requirement to maintain operational capacity to operate the dam safely to prevent harm to public and environmental resources. This program is part of PG&E's Dam Safety Program, Safe Dam Operating Capacity Metric and follows the FERC engineering guidelines and DSOD requirements.

Operational and Executional Considerations: Power Generation follows industry best practices as identified in the ISO 55001 certification that it achieved in March 2022. These practices include a prudent risk-informed asset management approach to managing asset risk through the asset lifecycle. Absent appropriate funding to ensure continued risk reduction and prevention of a serious safety or reliability incident will likely occur in the future. The investments needed to retrofit the dams and components to meet design requirements or for upkeeping do not always have CBR scores greater than one. In general, mitigation projects that are large, complex, and require multiyear design and construction tend to have lower CBRs because of the higher implementation costs.

Bowtie Modeling Limitations: The risk reduction may be underestimated due to data and modeling limitations. An example of such a limitation is that significant deficiencies identified by our regulators that are not satisfactorily mitigated in a timely manner could result in revoking of license and a halt in operations. This is difficult to quantify and currently not captured in the risk modeling.

All projects within the LGUWR-M004 – LLO Refurbishments are essential in ensuring the long-term safe and reliable operations of PG&E dams and are directed at preventing a large uncontrolled water release incident.

Cost

Estimates were developed using historical data from similar projects. This project includes extensive environmental remediation and site access is extremely limited. These issues will likely result in a higher cost forecast than what is currently included in this project summary.

Major Project Spending Estimates
(Thousands of Nominal Dollars)

CAPITAL

Planning Order	Description	CBR	Operative Date	2024 CWIP	2025 Forecast	2026 Forecast	2027 Forecast	2028 Forecast	2029 Forecast	2030 Forecast	CWIP + 2025 - '30 Total
5785096	Pit 3 LLO Replace No. 1,2,3 Actuator	22.4	December 2029	734		23	29	3,119	3,121	94	**7,119**

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Benefits

- The existing system is antiquated and well beyond its useful service life.
- Ensures safe operations at Pit 3 by avoiding the possibility of an uncontrolled water release.
- Ensures Pit 3 delivers a higher level of power generation reliability resulting from a reduction in forced outages caused by this aging equipment. This results in a replacement power cost savings for customers.
- Eliminates the environmental risk of the release of hydraulic fluid in the water.

Alternatives Considered

Status Quo: Do nothing - This alternative is not recommended. This alternative may result in an uncontrolled water release. It also may result in a lower level of power generation reliability resulting from an increase in forced outages caused by this aging equipment. This results in a replacement power costs for customers. In addition, this alternative does not eliminate the environmental risk of the release of hydraulic fluid in the water.

Alternative 1: Replace actuators – This is the recommended alternative. Replacing the actuators ensures safe operations at Pit 3 by avoiding the possibility of an uncontrolled water release. This alternative also ensures Pit 3 delivers a higher level of power generation reliability resulting from a reduction in forced outages caused by this aging equipment. This results in a replacement power cost savings for customers. This alternative also eliminates the environmental risk of the release of hydraulic fluid in the water.

Alternative 2: Reschedule One Year – This alternative is not recommended. This alternative assumes the project is rescheduled by one year. This alternative ultimately has the same long-term benefits as the recommended alternative; however, in the short-term, this alternative is not recommended for the same reasons discussed in status quo.

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Project Summary

Project Title: Pit 6 Radial Gates Arms and Trunnions

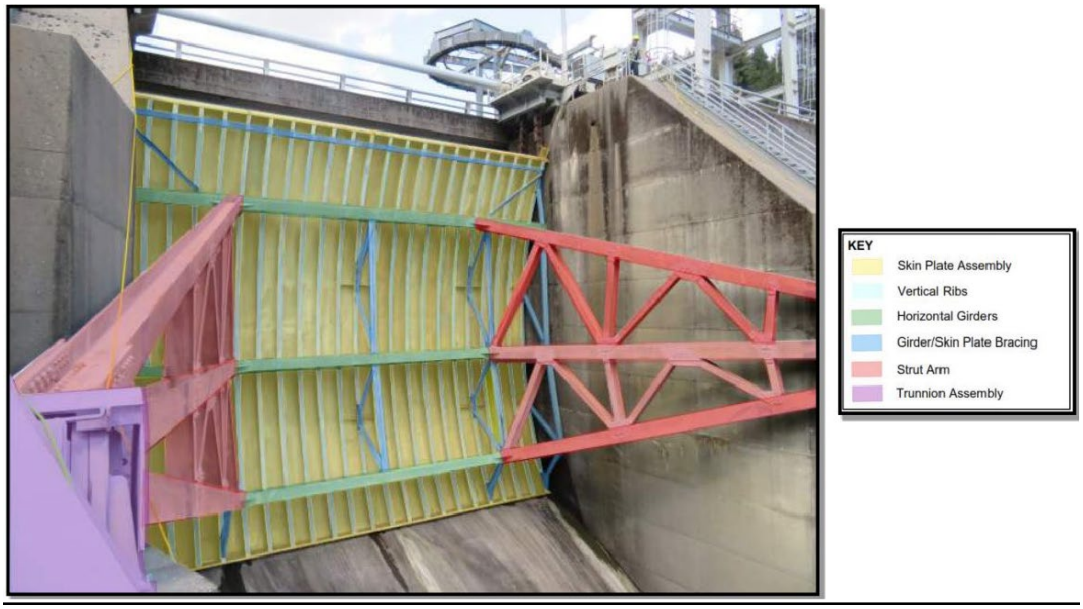
Major Work Categories: 2L
Planning Order Numbers: 5771200 (Gate 1) / 5776722 (Gate 2)
Project Start Date: 2026 (Gate 1) / 2028 (Gate 2)
Project Completion Date: 2030 (Gate 1) / 2032 (Gate 2)
Operative Date (only applies to Capital): December 2029 (Gate 1) / November 2032 (Gate 2)

Project Description

The Pit 6 Project includes 2-units located in the upper reaches of the Pit River. The Pit 6 powerhouse produces an average of about 374 GWh of electricity per year and provides 80 MW of dependable capacity to help meet our customers' summertime demand for electricity.

The scope of this work is to engineer, permit, procure and construct replacement of the entire trunnion bearings and gate arms with high yield strength steel. The gates will be recoated, and the gate seals will be replaced as needed.

Pit 6 Radial Gate Details



Justification

In 2005, the State of California, Department of Safety of Dams (DSOD) requested radial gate tests be performed to evaluate long-term friction and steel yield stress in the radial gate and gate arms. High stresses were noted in the radial gate arms required PG&E to take actions on the findings. Resulting in improving the strength of the Radial Gate Arms and Trunnions/Bearings to achieve DSOD long-term friction and strength standards making PG&E compliant.

Additionally, this project is a mitigation to the Large Uncontrolled Water Release (LGUWR) risk. More specifically, these projects are part of the Spillway (LGUWR-M002 – Spillway Remediation) projects included in PG&Es 2024 Risk Assessment and Mitigation Phase (RAMP) filing. PG&E is responsible for maintaining the spillways as required by the PG&E Dam Safety Program. This program is mandated by Federal and State

compliance requirements which alignments with the requirement to maintain operational capacity to operate the dam safely to keep the public safety and to prevent harm to public and environmental resources. This program follows the FERC engineering guidelines and DSOD requirements.

The CBR for LGUWR-M002 is 1.1. PG&E's risk mitigation strategies are selected to ensure that safety remains PG&E's top priority even when the quantitative modelling indicates the costs are higher than the modeled value of risk reduction**.** Other factors are considered when selecting mitigations, including the following:

Compliance: PG&E dams are regulated by two governmental agencies: FERC per Title 18 - Conservation of Power and Water Resources, Part 12 - Safety of Water Power Projects and Project Works, and DSOD per CCR Title 23 - Waters. PG&E is responsible for meeting compliance requirements and obligations to ensure its dams and associated components meet design requirements and can be operated in a reliable and safe manner. For example, dams are required to safely pass the design storm flows and not fail catastrophically for earthquakes up to the design load. Critical components such as spillway gates and LLOs, along with their power supply and backups, need to be operational during dam safety emergencies and routine operations.

Operational and Execution Considerations: Power Generation follows industry best practices as identified in the ISO 55001 certification that it achieved in March 2022. These practices include a prudent risk-informed asset management approach to managing asset risk through the asset lifecycle. Absent appropriate funding to ensure continued risk reduction and prevention, a serious safety or reliability incident will likely occur in the future. The investments needed to retrofit the dams and components to meet design requirements or for upkeeping do not always have CBR scores greater than one. In general, mitigation projects that are large, complex, and require multiyear design and construction tend to have lower CBRs because of the higher implementation costs.

CBR/Bow Tie Modeling Limitations or Uncertainties: The risk reduction may be underestimated due to data and modeling limitations. An example of such a limitation is that significant deficiencies identified by our regulators that are not satisfactorily mitigated in a timely manner could result in revoking of license and a halt in operations. This is difficult to quantify and currently not captured in the risk modeling.

All projects within the LGUWR-M002 – Spillway Remediation mitigations are essential in ensuring the long-term safe and reliable operations of PG&E dams and are directed at preventing a large uncontrolled water release incident.

Cost

Historical data and professional knowledge were used to establish the cost assumptions below.

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CAPITAL

Planning Order	Description	CBR	Operative Date	2024 CWIP	2025 Forecast	2026 Forecast	2027 Forecast	2028 Forecast	2029 Forecast	2030 Forecast	CWIP + 2025 - '30 Total
5771200	Pit 6 Radial Gate1 Repl Arms & Trunnions	1.2	December 2029	274	0	215	1,148	2,305	12,962	92	**16,996**
5776722	Pit 6 Radial Gate2 Repl Arms & Trunnions	4.1	November 2032					317	1,608	2,811	**4,736**

Benefits

- Completion of this work will allow for reliable and safe operation of the dam that is in compliance with DSOD requirements by improving the strength that follows the friction and strength standards set by DSOD.
- Potential avoidance of future O&M expense cost increases associated with maintaining this aging equipment.
- Potential avoidance of higher capital costs for equipment/system replacement on an expedited basis if any of the major equipment or systems fails.
- A higher level of power generation reliability resulting from a reduction in forced outages caused by this aging equipment. This results in replacement power cost savings for customers.

Alternatives Considered

Status Quo: Do nothing – This alternative is not recommended. The project is required by DSOD and is therefore not optional.

Alternative 1: Replace radial gate arms and trunnions – This is the recommended alternative. The project is required by DSOD and is therefore not optional. Replacement of the dam radial gates arms and trunnions is the solution to adequately strengthen the gate elements to meet DSOD requirements.

Alternative 2: Reschedule Replacement of Gate Trunnion – This alternative is not recommended. This alternative results in a risk of a notice of violation from DSOD.

Alternative 3: Strengthen Radial Gate Arms – This alternative is not recommended. This alternative was evaluated and determined to be insufficient to address the problem to comply with DSOD.

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Project Title: Pit 7 Radial Gates Arms and Trunnions

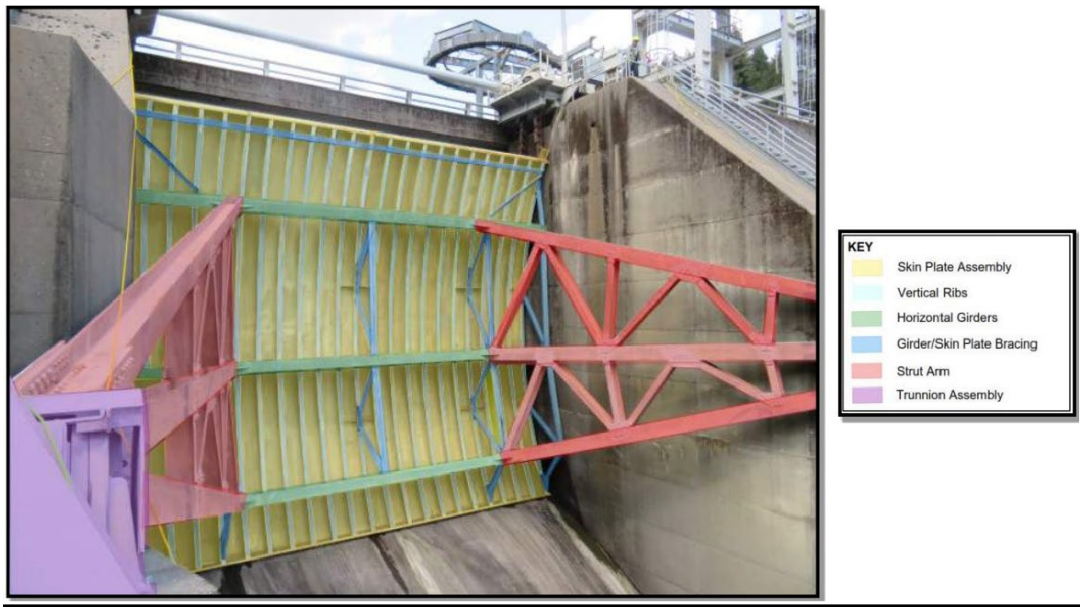
Major Work Categories: 2L
Planning Order Numbers: 5771199 (Gate 1) / 5776723 (Gate 2)
Project Start Date: January 2025 (Gate 1) / January 2027 (Gate 2)
Project Completion Date: October 2028 (Gate 1) / November 2030 (Gate 2)
Operative Date (only applies to Capital): 10/2028 (Gate 1) / 11/2030 (Gate 2)

Project Description

The Pit 7 Project includes 2-units located in the lower reaches of the Pit River. The Pit 7 powerhouse produces an average of about 512 GWh of electricity annually and provides 112 MW of dependable capacity to help meet our customers' summertime demand for electricity.

The scope of this work is to engineer, permit, procure and construct replacement of the entire trunnion bearings and gate arms with high yield strength steel. The gates will be recoated, and the gate seals will be replaced as needed.

Pit 7 Radial Gate Details



Justification

In 2005, the State of California, Department of Safety of Dams (DSOD) requested radial gate tests be performed to evaluate long-term friction and steel yield stress in the radial gate and gate arms. High stresses were noted in the radial gate arms required PG&E to take actions on the findings. Resulting in improving the strength of the Radial Gate Arms and Trunnions/Bearings to achieve DSOD long-term friction and strength standards making PG&E compliant.

Additionally, these projects are a mitigation to the Large Uncontrolled Water Release (LGUWR) risk. More specifically, these projects are part of the Spillway (LGUWR-M002 – Spillway Remediation) projects included in PG&Es 2024 Risk Assessment and Mitigation Phase (RAMP) filing. PG&E is responsible for maintaining the spillways as required by the PG&E Dam Safety Program. This program is mandated by Federal and State

compliance requirements which alignments with the requirement to maintain operational capacity to operate the dam safely to keep the public safety and to prevent harm to public and environmental resources. This program follows the FERC engineering guidelines and DSOD requirements.

The CBR for LGUWR-M002 is 1.1 PG&E's risk mitigation strategies are selected to ensure that safety remains PG&E's top priority even when the quantitative modelling indicates the costs are higher than the modeled value of risk reduction. Other factors are considered when selecting mitigations, including the following:

Compliance: PG&E dams are regulated by two governmental agencies: FERC per Title 18 - Conservation of Power and Water Resources, Part 12 - Safety of Water Power Projects and Project Works, and DSOD per CCR Title 23 - Waters. PG&E is responsible for meeting compliance requirements and obligations to ensure its dams and associated components meet design requirements and can be operated in a reliable and safe manner. For example, dams are required to safely pass the design storm flows and not fail catastrophically for earthquakes up to the design load. Critical components such as spillway gates and LLOs, along with their power supply and backups, need to be operational during dam safety emergencies and routine operations.

Operational and Execution Considerations: Power Generation follows industry best practices as identified in the ISO 55001 certification that it achieved in March 2022. These practices include a prudent risk-informed asset management approach to managing asset risk through the asset lifecycle. Absent appropriate funding to ensure continued risk reduction and prevention, a serious safety or reliability incident will likely occur in the future. The investments needed to retrofit the dams and components to meet design requirements or for upkeeping do not always have CBR scores greater than one. In general, mitigation projects that are large, complex, and require multiyear design and construction tend to have lower CBRs because of the higher implementation costs.

CBR/Bow Tie Modeling Limitations or Uncertainties: The risk reduction may be underestimated due to data and modeling limitations. An example of such a limitation is that significant deficiencies identified by our regulators that are not satisfactorily mitigated in a timely manner could result in revoking of license and a halt in operations. This is difficult to quantify and currently not captured in the risk modeling.

All projects within the LGUWR-M002 – Spillway Remediation mitigations are essential in ensuring the long-term safe and reliable operations of PG&E dams and are directed at preventing a large uncontrolled water release incident.

Cost

Historical data and professional knowledge were used to establish the cost assumptions below.

Major Project Spending Estimates
(Thousands of Nominal Dollars)

CAPITAL

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Planning Order	Description	CBR	Operative Date	2024 CWIP	2025 Forecast	2026 Forecast	2027 Forecast	2028 Forecast	2029 Forecast	2030 Forecast	CWIP + 2025 - '30 Total
5771199	Pit 7 Radial Gate1 Repl Arms & Trunnions	2.1	October 2028	131	321	966	2,829	12,320	102		**16,669**
5776723	Pit 7 Radial Gate2 Repl Arms & Trunnions	2.1	November 2030				274	1,182	2,600	11,917	**15,973**

Benefits

- Completion of this work will allow for reliable and safe operation of the dam that is in compliance with DSOD requirements by improving the strength that follows the friction and strength standards set by DSOD.
- Potential avoidance of future O&M expense cost increases associated with maintaining this aging equipment.
- Potential avoidance of higher capital costs for equipment/system replacement on an expedited basis if any of the major equipment or systems fails.
- A higher level of power generation reliability resulting from a reduction in forced outages caused by this aging equipment. This results in replacement power cost savings for customers.

Alternatives Considered

Status Quo: Do nothing – This alternative is not recommended. The project is required by DSOD and is therefore not optional.

Alternative 1: Replace radial gate arms and trunnions – This is the recommended alternative. The project is required by DSOD and is therefore not optional. Replacement of the dam radial gates arms and trunnions is the solution to adequately strengthen the gate elements to meet DSOD requirements.

Alternative 2: Reschedule Replacement of Gate Trunnion – This alternative is not recommended. This alternative results in a risk of a notice of violation from DSOD.

Alternative 3: Strengthen Radial Gate Arms – This alternative is not recommended. This alternative was evaluated and determined to be insufficient to address the problem to comply with DSOD.

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Project Title: Seismic Retrofits

Major Work Categories: 2M, 2N, 2P
Planning Order Numbers: 5802878, 5812254, 5812262, 5812326
Project Start Date: ,5802878 - 2024, 5812254 -2028, 5812262 -2029, 5812326 -2030
Project Completion Date: 5802878 -2031, 5812254 -2030, 5812262 -2030 , 5812326 -2030
Operative Date (only applies to Capital): 5802878 -2031, 5812254 -2030, 5812262 -2030, 5812326 -2030

Project Description

PG&E implements seismic retrofit projects to ensure dams, intakes assets and other components will not fail under the seismic event. Seismic retrofit projects include strengthening structural capability of the dams and components such as spillway gates, intake structures, and LLOs. The scope of projects includes seismic retrofit of dams and their critical components to meet the seismic design criteria.

Justification

These projects are mitigations to the Large Uncontrolled Water Release (LGUWR) risk. More specifically, these projects are part of the Seismic Retrofit (LGUWR-M003 – Seismic Retrofit) mitigation projects included in PG&Es 2024 Risk Assessment and Mitigation Phase (RAMP) filing. PG&E's dams are located near known faults and these mitigation projects are needed to ensure the dams will not catastrophically fail for earthquakes with magnitudes up to their design level.

The CBR for LGUWR-M003 is 0.4. PG&E's risk mitigation strategies and projects within those strategies are selected to ensure that safety remains PG&E's top priority even when the quantitative modelling indicates the costs are higher than the modeled value of risk reduction**.** Other factors are considered when selecting mitigations, including the following:

Compliance: PG&E dams are regulated by two governmental agencies: FERC per Title 18 - Conservation of Power and Water Resources, Part 12 - Safety of Water Power Projects and Project Works, and DSOD per CCR Title 23 - Waters. PG&E is responsible for meeting compliance requirements and obligations to ensure its dams and associated components meet design requirements and can be operated in a reliable and safe manner. For example, dams are required to safely pass the design storm flows and not fail catastrophically for earthquakes up to the design load. Critical components such as spillway gates and LLOs, along with their power supply and backups, need to be operational during dam safety emergencies and routine operations.

Operational and Execution Considerations: Power Generation follows industry best practices as identified in the ISO 55001 certification that it achieved in March 2022. These practices include a prudent risk-informed asset management approach to managing asset risk through the asset lifecycle. Absent appropriate funding to ensure continued risk reduction and prevention, a serious safety or reliability incident will likely occur in the future. The investments needed to retrofit the dams and components to meet design requirements or for upkeeping do not always have CBR scores greater than one. In general, mitigation projects that are large, complex, and require multiyear design and construction tend to have lower CBRs because of the higher implementation costs.

CBR/Bow Tie Modeling Limitations or Uncertainties: The risk reduction may be underestimated due to data and modeling limitations. An example of such a limitation is that significant deficiencies identified by our regulators that are not satisfactorily mitigated in a timely manner could result in revoking of license and a halt in

operations. This is difficult to quantify and currently not captured in the risk modeling.

All projects within the LGUWR-M003 – Seismic Retrofit are essential in ensuring the long-term safe and reliable operations of PG&E dams and are directed at preventing a large uncontrolled water release incident.

Cost

The cost assumptions for these projects are based on professional judgment and historic PG&E cost data for similar work.

Major Project Spending Estimates
(Thousands of Nominal Dollars)

CAPITAL

Planning Order	Description	CBR	Operative Date	2024 CWIP	2025 Forecast	2026 Forecast	2027 Forecast	2028 Forecast	2029 Forecast	2030 Forecast	CWIP + 2025 - '30 Total
5802878	Belden Intake Structure Seismic Improve	0.07	December 2031	38		82	238	275	312	4,686	**5,631**
5812254	Bucks Storage Dam Intake Tower Retrofit	0.05	December 2030					459	780	1,406	**2,645**
5812262	Butt Valley Pratville Intk Seismic Imprv	0.8	December 2030						104	234	**338**
5812326	Lower Bucks Dam Abandon Intake Tower	0.03	December 2030							469	**469**

Benefits

Reduces the risk of a dam from catastrophically failing as a result of earthquakes with magnitudes up to their design level.

Alternatives Considered

Status Quo: Do Nothing – This alternative is not recommended. This alternative is not responsive to mandatory DSOD and License requirements and does not address the potential risk of failure.

Alternative 1: Seismic Retrofits – This is the recommended alternative. This alternative reduces the risk of a dam from catastrophically failing as a result of earthquakes with magnitudes up to their design level.

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Project Title: Spillway Gate Program

Major Work Categories: AX, 2L, 2M, 2N, 3H
Planning Order Numbers: See table below
Project Start Date: Various
Project Completion Date: Various
Operative Date (only applies to Capital): Various

Project Description

The Spillway Gate Program is a program developed to inform and execute a collection of improvements to the spillway gates at PG&E Hydro Dam facilities. These improvements to the spillway gates include but are not limited to upgrades and/or replacement of power systems, operator systems, hoists, motors, chains/cable systems, structural supports, concrete piers and ogee, gate structure members including gate arms, gate trunnions, gate skin plates, and secondary structural support members. These projects improve PG&E Hydro Dam facilities spillway pathway and operational capacity during normal operational and flood operational conditions.

Justification

These projects are mitigations to the large uncontrolled water release (LGUWR) risk. More specifically, these projects are part of the Spillway Remediation (LGUWR-M002) mitigation projects included in PG&Es 2024 Risk Assessment and Mitigation Phase (RAMP) filing. PG&E is responsible for maintaining the spillway gates as required by the PG&E Dam Safety Program. This program is mandated by Federal and State compliance requirements which alignments with the requirement to maintain operational capacity to operate the dam safely to keep the public safety and to prevent harm to public and environmental resources. This program is monitored by PG&E Safe Dam Operating Capacity Metric and follows the FERC engineering guidelines and DSOD requirements.

The CBR for LGUWR-M002 is 1.1. PG&E's risk mitigation strategies and projects within those strategies are selected to ensure that safety remains PG&E's top priority even when the quantitative modelling indicates the costs are higher than the modeled value of risk reduction. Other factors are considered when selecting mitigations, including the following:

Compliance: PG&E dams are regulated by two governmental agencies: FERC per Title 18 - Conservation of Power and Water Resources, Part 12 - Safety of Water Power Projects and Project Works, and DSOD per CCR Title 23 - Waters. PG&E is responsible for meeting compliance requirements and obligations to ensure its dams and associated components meet design requirements and can be operated in a reliable and safe manner. For example, dams are required to safely pass the design storm flows and not fail catastrophically for earthquakes up to the design load. Critical components such as spillway gates and LLOs, along with their power supply and backups, need to be operational during dam safety emergencies and routine operations.

Operational and Execution Considerations: Power Generation follows industry best practices as identified in the ISO 55001 certification that it achieved in March 2022. These practices include a prudent risk-informed asset management approach to managing asset risk through the asset lifecycle. Absent appropriate funding to ensure continued risk reduction and prevention, a serious safety or reliability incident will likely occur in the future. The investments needed to retrofit the dams and components to meet design requirements or for upkeeping do not always have CBR scores greater than one. In general, mitigation projects that are large,

complex, and require multiyear design and construction tend to have lower CBRs because of the higher implementation costs.

CBR/Bow Tie Modeling Limitations or Uncertainties: The risk reduction may be underestimated due to data and modeling limitations. An example of such a limitation is that significant deficiencies identified by our regulators that are not satisfactorily mitigated in a timely manner could result in revoking of license and a halt in operations. This is difficult to quantify and currently not captured in the risk modeling.

All projects within the LGUWR-M002 – Spillway Remediation mitigations are essential in ensuring the long-term safe and reliable operations of PG&E dams and are directed at preventing a large uncontrolled water release incident.

Cost

The cost assumptions for this project are based on professional judgment of the local engineering and hydro team familiar with this type of work.

Major Project Spending Estimates
(Thousands of Nominal Dollars)

CAPITAL

Planning Order	Description	CBR	Operative Date	2024 CWIP	2025 Forecast	2026 Forecast	2027 Forecast	2028 Forecast	2029 Forecast	2030 Forecast	CWIP + 2025 - '30 Total
5776899	Rock Cr Dam Drum Gate Repl Hose	n.a	December 2025		400						**400**
5792673	Rock Cr Dam Rpl Radial BP Gate Hoist & C	1.4	October 2029	17			105	252	1,716		**2,091**
5792674	Cresta Dam Rpl Radial BP Gate Hoist & Ct	n.a.	October 2026	541	953	1,264					**2,758**
5802602	Pit 7 Dam Radial Gate Chain Replacement	n.a	December 2026		65	547	42	4	3		**661**
5802603	Pit 6 Dam Radial Gate Chain Replacement	n.a	December 2026	7	131	544	38				**727**
5802899	Fordyce Dam Replace Radial Gate Actuator	0.5	October 2028	184		123	162	1,579	76		**2,124**
5804217	McCloud Dam Replace Debris Boom	35.4	December 2027	108	250	366	951	92			**1,768**
5805443	Rock Creek Dam Upgr Drum Gate Indicators	n.a.	December 2025	513	1,642	57					**2,750**
5805970	Pit 6 Dam Replace Debris Boom	6646	October 2027	50		1,585	48				**1,682**
5805971	Pit 4 Dam Debris Boom Replacement	1.8	November 2027			388	1,888	46			**2,322**
5806779	Relief Dam Install Log Boom	4.9	October 2028			116	48	321			**485**
5806819	Rock Creek Dam Replace Gate Control RTUs	1.6	October 2027	17		43	547				**607**
5806841	Cresta Dam Replace Gate Control RTUs	0.6	June 2027	3		249	552				**804**
5806844	PV Scott Dam Inst New Log Boom Anchors	n.a	October 2026	17		46					**63**
5808116	Rock Creek Dam Recoat Radial BP Gate GIR	0.2	October 2031						104	843	**947**
5808117	Lower Bear Dam Recoat Radial Gate GIR	0.1	August 2029						520		**520**
5808199	Cresta Dam Recoat Radial BP Gate GIR	n.a	December 2026	17		699					**716**

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Planning Order	Description	CBR	Operative Date	2024 CWIP	2025 Forecast	2026 Forecast	2027 Forecast	2028 Forecast	2029 Forecast	2030 Forecast	CWIP + 2025 - '30 Total
5808200	Belden Dam Recoat Radial Gates GIR	35.7	December 2032							187	**187**
5808202	Rock Creek Dam Recoat Drum Gate 2	n.a	December 2025		1,062						**1,062**
5808204	Pit 1 Dam Paint Radial Gate 5 GIR	0.01	August 2029				190	275	1,664	19	**2,149**
5808205	Pit 6 Dam Paint Radial Gate GIR	6.7	October 2030					138	988	890	**2,016**
5808207	Cresta Dam Recoat Drum Gate 1	n.a	August 2026			776	24				**800**
5808620	Blue Lake Dam Replace Log Boom	0.2	August 2028			116	238	229	10		**594**
5808621	Kidd Lake Dam Install Log Boom	0.01	November 2027	25		196	622	5			**849**
5808703	Pit 1 Fbay Dam Rep Gates 4 & 5 Chains	0.4	August 2029				76	138	624		**838**
5808805	Wishon Dam Recoat Radial Gates GIR	12.1	December 2027				71				**71**
5812074	Spaulding Dam 2 Rplc Gate Hoist 8 -10	0.01	July 2030						780	1,406	**2,186**
5812076	Upper Peak Dam Install Log Boom	0.9	August 2032							47	**47**
5812077	Rucker Lake Dam Install Log Boom	0.3	March 2032							70	**70**
5812082	Spaulding 3 Aux Spillway Inst Log Boom	8.4	December 2027			116	143	23			**282**
5812113	Salt Springs Dam Replc 12 Gate Hoist	0.02	November 2029			582	713	2,752	4,681		**8,729**
5812248	Belden Dam Repl Radial Gates Hoist	24.4	December 2030						780	2,811	**3,592**
5812668	Kerckhoff Dam Rplc Spillway Gates 10-14	n.a.	December 2030				143	413	3,121	6,560	**10,236**

Benefits

- Reduces the risk of a large uncontrolled water release and the possible environmental/public safety concerns that come as a result.
- Increases reliability of PG&E Hydro Dam Facilities operational capacity during normal operating conditions and high flow/flood conditions.
- Reduction in future expense cost increases where structures are replaced with newer construction.

Alternatives Considered

Status Quo: Do nothing – This alternative is not recommended. This alternative assumes that no action is taken other than minimal maintenance until unplanned failure. A very long forced outage would occur until new components could be fabricated and installed resulting in additional costs for expedited work and excessive customer replacement power costs. In addition, the above benefits would not be realized.

Alternative 1: Implement Spillway Gate Program – This is the recommended alternative. It reduces the risk of a large uncontrolled water release and the possible environmental/public safety concerns that come as a result. It increases the reliability of PG&E Hydro Dam Facilities operational capacity during normal operating conditions and high flow/flood conditions. It also reduces future expense cost increases where structures are replaced with newer construction.

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Alternative 2: Reschedule One Year – This alternative is not recommended. This alternative assumes the projects are rescheduled by one year. This alternative ultimately has the same long-term benefits as the recommended alternative; however, in the short-term, this alternative is not recommended for the same reasons discussed in status quo.

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Project Title: Rock Creek/Cresta Cofferdam

Major Work Categories: 2N
Planning Order Numbers: 5784683
Project Start Date: 2019
Project Completion Date: 2025
Operative Date (only applies to Capital): November 2026

Project Description

Rock Creek Dam and Cresta Dam were both constructed approximately 70 years ago and are located on the North Fork Feather River in Plumas County. Both dams are located upstream of their respective powerhouse and are nearly identical in construction, being comprised of two identical drum spill gates and a radial bypass gate. Each drum gate is 28 feet high and 124 feet in length. The radial bypass gate is 15 feet high and 22.5 feet in length.

The intent of this project is to maintain reservoir levels such that power generation is possible during the period when the required work to the drum gates and dam is performed. A modular cofferdam has been designed and is currently being fabricated. The cofferdam will be reusable for each of the drum spill gates at both locations when drum gate work is required. The cofferdam is composed of 14 modules, each approx. 40’ tall and 9’ wide, which will mount to a series of base plates permanently installed on base of the dam. The cofferdam will be stored by PG&E at Rodgers Flat in a storage facility that will be designed and constructed as a part of this project.

Justification

Each of the drum gates at both sites require coating, sediment dredging, replacing the drum gate seals, other regular or emergent work be performed. When the gates are serviced, current practice is to draw down the reservoir and install flashboards on the upstream side of the gate. The design elevation of the flashboards is lower than that of the minimum reservoir elevation necessary to supply water flows to the powerhouse to generate power. Therefore, routine work on the drum gates results in either reduced or no power generation at the associated powerhouse. Due to the anticipated duration of the drum gate recoating and other work activities, PG&E is building a reusable modular cofferdam to enable normal reservoir levels to be maintained and thus not impact power generation. A single cofferdam will be reused for each of the four drum gates (two at Rock Creek and two at Cresta). The cofferdam will be stored on nearby PG&E property with the intent to be reused as needed for work on a drum gate.

Additionally, this project is a mitigation to the Large Uncontrolled Water Release (LGUWR) risk. More specifically, this project is part of the Spillway (M002 – Spillway Remediation) projects included in PG&Es 2024 Risk Assessment and Mitigation Phase (RAMP) filing. PG&E is responsible for maintaining the spillways as required by the PG&E Dam Safety Program. This program is mandated by Federal and State compliance requirements which alignments with the requirement to maintain operational capacity to operate the dam safely to keep the public safety and to prevent harm to public and environmental resources. This program follows the FERC engineering guidelines and DSOD requirements.

PG&E’s risk mitigation strategies are selected to ensure that safety remains PG&E’s top priority even when the quantitative modelling indicates the costs are higher than the modeled value of risk reduction**.** Other factors are considered when selecting mitigations, including the following:

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Compliance: PG&E dams are regulated by two governmental agencies: FERC per Title 18 - Conservation of Power and Water Resources, Part 12 - Safety of Water Power Projects and Project Works, and DSOD per CCR Title 23 - Waters. PG&E is responsible for meeting compliance requirements and obligations to ensure its dams and associated components meet design requirements and can be operated in a reliable and safe manner. For example, dams are required to safely pass the design storm flows and not fail catastrophically for earthquakes up to the design load. Critical components such as spillway gates and LLOs, along with their power supply and backups, need to be operational during dam safety emergencies and routine operations.

Operational and Execution Considerations: Power Generation follows industry best practices as identified in the ISO 55001 certification that it achieved in March 2022. These practices include a prudent risk-informed asset management approach to managing asset risk through the asset lifecycle. Absent appropriate funding to ensure continued risk reduction and prevention, a serious safety or reliability incident will likely occur in the future. The investments needed to retrofit the dams and components to meet design requirements or for upkeeping do not always have CBR scores greater than one. In general, mitigation projects that are large, complex, and require multiyear design and construction tend to have lower CBRs because of the higher implementation costs.

CBR/Bow Tie Modeling Limitations or Uncertainties: The risk reduction may be underestimated due to data and modeling limitations. An example of such a limitation is that significant deficiencies identified by our regulators that are not satisfactorily mitigated in a timely manner could result in revoking of license and a halt in operations. This is difficult to quantify and currently not captured in the risk modeling.

All projects within the LGUWR-M002 – Spillway Remediation mitigations are essential in ensuring the long-term safe and reliable operations of PG&E dams and are directed at preventing a large uncontrolled water release incident.

Cost

The cost assumptions for this project are based on professional judgment of the local engineering and hydro team familiar with this type of work. Current cost estimates are based on past similar projects and AACE class 3 estimates.

Major Project Spending Estimates
(Thousands of Nominal Dollars)

CAPITAL

Planning Order	Description	Operative Date	2024 CWIP	2025 Forecast	2026 Forecast	2027 Forecast	2028 Forecast	2029 Forecast	2030 Forecast	CWIP + 2025 - '30 Total
5784683	Rock Creek/Cresta Cofferdam	November 2026	8,483	7,273	12,853	75				**38,684**

Benefits

A higher level of power generation reliability resulting from a reduction in outages and/or curtailments because of no longer needing to lower the water levels to do work on the drum gates and dam. This results in replacement power cost savings for customers.

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Alternatives Considered

Status Quo: Do nothing – This alternative is not recommended due to the risk of an environmental incident related to draining the reservoir to perform the required maintenance work to the drum gates and dam. In addition, this alternative results in replacement power costs for customers due to the need to lower the water level behind the dam.

Alternative 1: Modular Cofferdam – This is the recommended alternative. This alternative will decrease the likelihood of an environmental incident related to draining the reservoir by installing this equipment. In addition, a higher level of power generation reliability will be realized resulting from a reduction in outages and/or curtailments because of no longer needing to lower the water levels to do work on the drum gates and dam. This results in a replacement power cost savings for customers.

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Project Title: Salt Springs Dam Upgrade Log Boom DOE
Major Work Categories: 2N **Planning Order Numbers:** 5787970
Project Start Date: 2020
Project Completion Date: 2025
Operative Date (only applies to Capital): December 2025

Project Description

The Salt Springs Dam is located on the North Fork of the Mokelumne River about 33 miles northeast of Jackson, California. The dam is a concrete facing dumped rockfill embankment, about 330 feet high and 1,257 feet long, with a crest width of 5 feet. The dam and powerhouse were constructed between 1928 and 1931. Between 1946 and 1947, the spillway was modified by installation of 13 radial gates, and the dam was raised with a parapet wall to increase reservoir storage capacity. From the Salt Springs powerhouse, water is diverted by a feeder canal and tunnel system to the Tiger Creek reservoir and the Tiger Creek powerhouse.

The original debris boom was installed in 1987 and was made up of several steel drum buoys secured together end-to-end with shackles. The downstream end of the boom was attached to an anchorage point at the right dam abutment. The upstream end was attached to a sliding land anchor. In 1997, the original anchorage point at the right dam abutment was abandoned and the steel drum boom was replaced with an orange roto-molded plastic boom that was realigned to a new downstream anchorage point on the left side of the dam face. The upstream sliding anchor, located on the shore, was unchanged and is still in use today.

The current boom is a Tuff Boom product (no debris screens) that spans across the spillway structure. The safety boom floats on the surface of the reservoir primarily providing a public safety barrier for the spillway gates. The site is subject to high winds resulting in significant wind-driven wave runup and debris loading on the boom. The boom may gather debris; however, much of the debris bypasses the boom and is handled by PG&E operators with controlled sluicing of logs through the spillway radial gates. Seasonal water surface fluctuations beach the existing boom on shore for several months during the year.

The Salt Springs Reservoir Debris Boom Replacement project will install a new High-Density Polyethylene (HDPE) boom that will block large debris from entering the spillway gates preventing potential blockage. The new boom will continue to provide a visual and physical safety barrier to prevent the public from encountering the spillway gates while they are spilling.

Justification

The need for a log boom reliability assessment was identified by the 11th Part 12D Independent Consultant (ICs) as Recommendation No. R1-b in their 2017 Safety Inspection Report. Based on a potential failure mode Analysis (PFMA) and the actual performance of the log boom over the past 31 years of service, it was determined that a potential failure (PFM) of the log boom, due to debris blockage of the spillway during a probable maximum flood (PMF) event, could restrict the spillway radial gates operations resulting in potential dam overtopping. This would have a significant safety and environmental impact.

Additionally, this project is a mitigation to the Large Uncontrolled Water Release (LGUWR) risk. More specifically, this project is part of the Spillway (M002 – Spillway Remediation) projects that affect the Test Year Baseline risk value used to calculate the risk reduction for other programs with operative years after the 2027 GRC Test Year. PG&E is responsible for maintaining the spillways as required by the PG&E Dam Safety Program.

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This program is mandated by Federal and State compliance requirements which alignments with the requirement to maintain operational capacity to operate the dam safely to keep the public safety and to prevent harm to public and environmental resources. This program follows the FERC engineering guidelines and DSOD requirements.

PG&E's risk mitigation strategies are selected to ensure that safety remains PG&E's top priority even when the quantitative modelling indicates the costs are higher than the modeled value of risk reduction**.** Other factors are considered when selecting mitigations, including the following:

Compliance: PG&E dams are regulated by two governmental agencies: FERC per Title 18 - Conservation of Power and Water Resources, Part 12 - Safety of Water Power Projects and Project Works, and DSOD per CCR Title 23 - Waters. PG&E is responsible for meeting compliance requirements and obligations to ensure its dams and associated components meet design requirements and can be operated in a reliable and safe manner. For example, dams are required to safely pass the design storm flows and not fail catastrophically for earthquakes up to the design load. Critical components such as spillway gates and LLOs, along with their power supply and backups, need to be operational during dam safety emergencies and routine operations.

Operational and Execution Considerations: Power Generation follows industry best practices as identified in the ISO 55001 certification that it achieved in March 2022. These practices include a prudent risk-informed asset management approach to managing asset risk through the asset lifecycle. Absent appropriate funding to ensure continued risk reduction and prevention, a serious safety or reliability incident will likely occur in the future. The investments needed to retrofit the dams and components to meet design requirements or for upkeeping do not always have CBR scores greater than one. In general, mitigation projects that are large, complex, and require multiyear design and construction tend to have lower CBRs because of the higher implementation costs.

CBR/Bow Tie Modeling Limitations or Uncertainties: The risk reduction may be underestimated due to data and modeling limitations. An example of such a limitation is that significant deficiencies identified by our regulators that are not satisfactorily mitigated in a timely manner could result in revoking of license and a halt in operations. This is difficult to quantify and currently not captured in the risk modeling.

All projects within the LGUWR-M002 – Spillway Remediation mitigations are essential in ensuring the long-term safe and reliable operations of PG&E dams and are directed at preventing a large uncontrolled water release incident.

Cost

The cost assumptions for this project are based on professional judgment and historic PG&E cost data for similar work.

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Major Project Spending Estimates
(Thousands of Nominal Dollars)

CAPITAL

Planning Order	Description	Operative Date	2024 CWIP	2025 Forecast	2026 Forecast	2027 Forecast	2028 Forecast	2029 Forecast	2030 Forecast	CWIP + 2025 - '30 Total
5787970	Salt Springs Dam Upgrade Log Boom DOE	December 2025	5,044	708						**5,752**

Benefits

The new log boom will restrict debris from blocking the spillway and radial gates. This will allow water to pass safely and keep the dam from overtopping resulting in significant safety and environmental improvement.

Alternatives Considered

Status Quo: (Do Nothing) - This alternative is not recommended. It would result in an over topping of the dam resulting in a risk to public safety and damage to local infrastructure like campgrounds and roads as well as environmental impacts to the wildlife downstream.

Alternate 1: Replace the current log boom – This is the recommended alternative. The new log boom will block large debris from entering the spillway gates preventing a potential blockage. The new boom will continue to provide a visual and physical safety barrier to prevent the public from encountering the spillway gates while they are spilling.

Alternate 2: In-kind replacement of log boom – This alternative is not recommended. The existing log boom design is not of sufficient size to keep debris away from the dam gates and spillway. This design was rejected by regulators.

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Project Title: Spaulding Dam 1 Install Log Booms

Major Work Categories: 2N **Planning Order Numbers:** 5779023
Project Start Date: February 2024 **Project Completion Date:** June 2028
Operative Date (only applies to Capital): October 2027

Project Description

Lake Spaulding Dam #1 is located on the headwaters of the South Yuba River in Placer County, California. The dam is part of Drum-Spaulding Hydroelectric Project, Federal Energy Regulatory Commission (FERC) No. 2310. It consists of a 275-ft tall concrete arch structure with crest elevation of 4,875 ft, including a primary Low-Level Outlet (LLO) 30-inch pipe and sluice structure. Water enters Lake Spaulding through Fordyce Creek and South Yuba River. The outgoing water from Lake Spaulding enters two power tunnel intakes and feeds water for generation to Spaulding 1 and 2 powerhouses, subsequently feeding the downstream powerhouses at Upper Drum Watershed. The intake structures are located near the left abutment and adjacent to the dam and include upper and lower intake tunnel portals with a gate valve and vertical grizzly on each tunnel.

Spaulding Dam 1 does not currently have a log boom system. Logs and debris can travel down Fordyce Creek and the South Yuba River and float over to the dam. The logs and debris have been found to impact both the Lower power tunnel intake and LLO. The project proposes implementing a debris management program that includes installing a log boom to reduce or prevent the migration of floating timber materials to the upstream face of Spaulding Dam No.1 to avoid the need for timber dredging at the face of the dam.

Justification

Spaulding Dam No.1 does not currently have a log boom system. Debris from the incoming Fordyce Creek and South Yuba River water courses upstream of Lake Spaulding reaches to the Spaulding Dam No.1 pool because of an easterly wind-driven surface migration of floating timber. The timber accumulates along the upstream face of the dam and eventually over time settles from saturation and loss of buoyancy and ultimately impacts the critical infrastructure at
the dam.

The data of multiple bathymetric surveys and remote operating vehicle inspection that were conducted in the last few years found that the timber debris accumulation at the upstream face of dam is contributing to the partial blockage of the inlet of the LLO and it is also impacting the two power tunnel intakes.

The project proposes to install a new log boom system to reduce or prevent the migration of floating timber materials to the upstream face of dam and avoid the need for timber dredging at the face of the dam.

Additionally, this project is a mitigation to the large uncontrolled water release (LGUWR) risk. More specifically, this project is part of the Spillway Remediation (LGUWR-M002 – Spillway Remediation) mitigations included in PG&Es 2024 Risk Assessment and Mitigation Phase (RAMP) filing. PG&E implements Spillway Remediation mitigations (LGUWR-M002) to ensure its dams can safely pass the design flood events. Mitigation projects for LGUWR-M002 include improvements to or rehabilitation of spillway control structures, spillway chutes, gates, log booms, and operators.

The Cost Benefit Ratio (CBR) for LGUWR-M002 is 1.1. PG&E's risk mitigation strategies and projects included within those strategies are selected to ensure that safety remains PG&E's top priority even when the

quantitative modelling indicates the costs are higher than the modeled value of risk reduction**.** Other factors are considered when selecting mitigations, including the following:

Compliance Requirements: PG&E dams are regulated by two governmental agencies: FERC per Title 18 - Conservation of Power and Water Resources, Part 12 - Safety of Water Power Projects and Project Works, and DSOD per CCR Title 23 - Waters. PG&E is responsible for meeting compliance requirements and obligations to ensure its dams and associated components meet design requirements and can be operated in a reliable and safe manner. For example, dams are required to safely pass the design storm flows and not fail catastrophically for earthquakes up to the design load. Critical components such as spillway gates and LLOs, along with their power supply and backups, need to be operational during dam safety emergencies and routine operations.

Operational and Execution Considerations: Power Generation follows industry best practices as identified in the ISO 55001 certification that it achieved in March 2022. These practices include a prudent risk-informed asset management approach to managing asset risk through the asset lifecycle. Absent appropriate funding to ensure continued risk reduction and prevention, a serious safety or reliability incident will likely occur in the future. The investments needed to retrofit the dams and components to meet design requirements or for upkeeping do not always have CBR scores greater than one. In general, mitigation projects that are large, complex, and require multiyear design and construction tend to have lower CBRs because of the higher implementation costs.

CBR/Bow Tie Modeling Limitations or Uncertainties: The risk reduction may be underestimated due to data and modeling limitations. An example of such a limitation is that significant deficiencies identified by our regulators that are not satisfactorily mitigated in a timely manner could result in revoking of license and a halt in operations. This is difficult to quantify and currently not captured in the risk modeling.

All projects within the LGUWR-M002 – Spillway Remediations are essential in ensuring the long-term safe and reliable operations of PG&E dams and are directed at preventing a large uncontrolled water release incident.

Cost

The cost assumptions for this project are based on professional judgment of the local engineering and hydro team familiar with this type of work.

Major Project Spending Estimates
(Thousands of Nominal Dollars)

CAPITAL

Planning Order	Description	CBR	Operative Date	2024 CWIP	2025 Forecast	2026 Forecast	2027 Forecast	2028 Forecast	2029 Forecast	2030 Forecast	CWIP + 2025 - '30 Total
5779023	Spaulding Dam 1 Install Log Booms	0.1	October 2027	29	1,276	1,628	1,441				**4,373**

Benefits

Installation of the log boom will prevent debris build-up at the Spaulding 1 Dam LLO and power tunnel intakes reducing the future O&M expense cost increases to dredge for timber at the face of the dam to eliminate blockage of the inlet of the LLO and the two power tunnel intakes.

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Alternatives Considered

Status Quo - Do nothing: This alternative is not recommended. No installation of log boom. This alternative results in future O&M expense cost increases to dredge for timber at the face of the dam to eliminate blockage of the inlet of the LLO and the two power tunnel intakes.

Alternative 1 – Install Log Boom: This is the recommended alternative as this provides the most effective method to protect Spaulding 1 Dam and power tunnel intakes.

Alternative 2 - Reschedule in One Year – This alternative is not recommended. This alternative assumes the project is rescheduled in one year. This alternative has the same long-term benefits as the recommended alternative; however, in the short term, this alternative is not recommended for the reasons stated in the status quo.

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Project Title: Spaulding Dam 1 Replace LLO and Intake Rack

Major Work Categories: 2N
Planning Order Numbers: 5807220 **Project Start Date:** August 2023 **Project Completion Date:** June 2031
Operative Date (only applies to Capital): December 2029

Project Description

This project proposes to dredge and remove the sediments and debris, to provide access to the Low-Level Outlet (LLO) and power intake racks. The scope also includes replacement of both power tunnel intake trash racks and replacement of LLO system which includes a butterfly valve, guard valve, Instream Flow Release (IFR) valve as well the LLO piping and LLO intake trash rack.

The strategic objective of the project is to maintain safe and reliable operations of the dam. The LLO operation is currently restricted; however, the reservoir can be dewatered using the existing power intake tunnels in case of a dam emergency. Implementation of this project will improve the overall safety performance of this high hazard dam. The Spaulding system is required to provide reliable downstream powerhouse operations and Third-party water delivery commitments.

Justification

The existing LLO system and the power tunnel intake racks at Spaulding Dam 1 have reached the end of the useful service life. In addition, debris has accumulated around each system which adversely affects operations.

Debris on the upstream side of the LLO butterfly valve, LLO guard valve and power intake racks prohibit any potential repairs/replacement of these systems. The LLO system has approximately 15 ft of debris deposited on the upstream side and approximately 80% of the intake racks on the power tunnels is covered in debris. The total quantity of debris is estimated at 10,000 cubic yards. These quantities are based on surveys and remotely operated vehicle (ROV) inspections from 2016 to 2019.

During a dive inspection of the power tunnel intake racks in 2016, damaged and deteriorated rack panels were noted. With debris covering most of the lower power intake rack, the current conditions are expected tobe less than favorable and assumed to have debris damage. The power intake tunnels are a critical piece of the Lake Spaulding operating plan.

The current condition of the LLO is not acceptable due to the excessive leakage through the guard valve and the breached pipe. On July 3, 2023, operations staff at PG&E's Drum Switching Center detected a high flow condition at gauging station YB-116 which is downstream of Spaulding Dam 1. Investigation of the LLO pipe located the source of the leak to be a pipe breach near the exit of the LLO, approximately 7’ upstream of the butterfly valve. The breach is approximately 1ft long by 8 inches wide at the widest point. A near term expense project is to be implemented to repair the LLO pipe while this larger LLO capital replacement project including dredging is being planned and authorized.

This capital project will address further work on the LLO pipe which has reached its useful life. In addition, the guard valve currently leaks ~3-4 CFS. The LLO and powerhouse intake racks are recommended for replacement/refurbishment.

Additionally, this project is a mitigation to the large uncontrolled water release (LGUWR) risk. More specifically, this project is a part of the LLO Refurbishment (LGUWR-M004 – LLO Refurbishments) mitigation projects

included in PG&Es 2024 Risk Assessment and Mitigation Phase (RAMP) filing. PG&E implements LLO refurbishments (LGUWR-M004) to ensure the reservoir can be drained during an emergency or for dam operation and maintenance. LLOs do not directly mitigate the three major drivers (flood, seismic, and normal) but maintaining reliable operation of the LLOs is critical to lower the reservoir after a seismic event or during the progression of internal erosion failure modes to prevent a more catastrophic failure or to provide water movement during storm event and/or downstream water delivery obligations as a Instream Flow Release(IFR).

The CBR for LGUWR-M004 is 3.3. PG&E's risk mitigation strategies are selected to ensure that safety remains PG&E's top priority even when the quantitative modelling indicates the costs are higher than the modeled value of risk reduction**.** Other factors are considered when selecting mitigations, including the following:

Compliance Requirements: PG&E dams are regulated by two governmental agencies: FERC per CFR Title 18 - Conservation of Power and Water Resources, Part 12 - Safety of Water Power Projects and Project Works, and DSOD per CCR Title 23 - Waters. PG&E is responsible for meeting compliance requirements and obligations to ensure its dams and associated components meet design requirements and can be operated in a reliable and safe manner. For example, dams are required to safely pass the design storm flows and not fail catastrophically for earthquakes up to the design load. Critical components such as spillway gates and LLOs, along with their power supply and backups, need to be operational during dam safety emergencies and routine operations. PG&E is responsible for maintaining the LLOs as required by the PG&E Dam Safety Program and to ensure continued asset ownership and appropriate level of risk management. This program is mandated by Federal and State regulators and compliance requirements which aligns with the requirement to maintain operational capacity to operate the dam safely to prevent harm to public and environmental resources. This program is part of PG&E's Dam Safety Program, Safe Dam Operating Capacity Metric and follows the FERC engineering guidelines and DSOD requirements.

Operational and Executional Considerations: Power Generation follows industry best practices as identified in the ISO 55001 certification that it achieved in March 2022. These practices include a prudent risk-informed asset management approach to managing asset risk through the asset lifecycle. Absent appropriate funding to ensure continued risk reduction and prevention of a serious safety or reliability incident will likely occur in the future. The investments needed to retrofit the dams and components to meet design requirements or for upkeeping do not always have CBR scores greater than one. In general, mitigation projects that are large, complex, and require multiyear design and construction tend to have lower CBRs because of the higher implementation costs.

Bowtie Modeling Limitations: The risk reduction may be underestimated due to data and modeling limitations. An example of such a limitation is that significant deficiencies identified by our regulators that are not satisfactorily mitigated in a timely manner could result in revoking of license and a halt in operations. This is difficult to quantify and currently not captured in the risk modeling.

All projects within the LGUWR-M004 – LLO Refurbishments are essential in ensuring the long-term safe and reliable operations of PG&E dams and are directed at preventing a large uncontrolled water release incident.

Cost

The cost assumptions for this project are based on professional judgment and historic PG&E cost data for similar work.

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Major Project Spending Estimates
(Thousands of Nominal Dollars)

CAPITAL

Planning Order	Description	CBR	Operative Date	2024 CWIP	2025 Forecast	2026 Forecast	2027 Forecast	2028 Forecast	2029 Forecast	2030 Forecast	CWIP + 2025 - '30 Total
5807220	Spaulding Dam 1 Replace LLO and Intake Rack	0.8	December 2029	625	16,031	14,595	20,251	14,476	11,747	539	**78,265**

Benefits

This project will restore the low-level outlet to its original functionality and ensure a clear path for water flow. The restoration of the power tunnel intake racks will ensure clear path of water flow through the power tunnels and add upstream controls to ensure safe operation of the water delivery to power houses and canals. This project is a mitigation (LGUWR-M004 – LLO Refurbishments) to the large uncontrolled water release (LGUWR) risk. PG&E implements LLO refurbishments to ensure the reservoir can be drained during an emergency or for dam maintenance. In addition, PG&E is required by regulations to ensure the LLOs are maintained and in good operating condition. The CBR for LGUWR M004 is 3.3.

Alternatives Considered

Status Quo – This is not an acceptable alternative as restoration of water delivery methods is required for safe dam operations in case of a high flow event as well as license conditions for meeting environmental water releases. PG&E is required by regulations to ensure the LLOs are maintained and in good operating condition.

Alternative 1: Spaulding Dam 1 Replace LLO and Intake Rack – This is the recommended alternative. Full replacement of the low-level outlet and restoration of power tunnel intake racks and addition of upstream isolation ensures that the LLOs are maintained and in good operating condition as required by regulations.

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Project Title: Spaulding 2 Dam Apron Extension

Major Work Categories: 2N
Planning Order Numbers: 5793568 Project Start Date: 2024
Project Completion Date: 2027
Operative Date (only applies to Capital): October 2026

Project Description

This project proposes to extend the existing concrete apron approximately 75 ft downstream, install rock anchors through non-overflow structures, armor and rock anchor the rock downstream of the non-overflow and flashboard areas, and address shear zones identified particularly at the left abutment.

Justification

In June 2017, PG&E received letters from the Federal Energy Regulatory Commission (FERC) about potential failure modes associated with concrete chute spillways and unlined spillways at dams. A detailed spillway assessment was performed with an independent consultant. Findings detailed that the existing condition of the Spaulding Dam 2 spillway apron is not robust enough to halt head cutting erosion in a major discharge event. PG&E conducted an erodibility study in 2019 which concluded that the undermining of the concrete apron along the shear zone forming the slot canyon is likely to continue and can progress substantially for flows greater than 15,000 cfs, which could result in localized damage to the end of the apron. Additionally, continued erosion along the shear zone in the upper portion of the slot canyon also facilitates the plucking of intact rock adjacent to the shear zone, especially at lower discharges (< 30,000 cfs) when turbulence levels are higher.

Additionally, this project is a mitigation to the Large Uncontrolled Water Release (LGUWR) risk. More specifically, this project is part of the Spillway (LGUWR-M002 – Spillway Remediation) projects included in PG&Es 2024 Risk Assessment and Mitigation Phase (RAMP) filing. PG&E is responsible for maintaining the spillways as required by the PG&E Dam Safety Program. This program is mandated by Federal and State compliance requirements which alignments with the requirement to maintain operational capacity to operate the dam safely to keep the public safety and to prevent harm to public and environmental resources. This program follows the FERC engineering guidelines and DSOD requirements.

PG&E's risk mitigation strategies are selected to ensure that safety remains PG&E's top priority even when the quantitative modelling indicates the costs are higher than the modeled value of risk reduction**.** Other factors are considered when selecting mitigations, including the following:

Compliance: PG&E dams are regulated by two governmental agencies: FERC per Title 18 - Conservation of Power and Water Resources, Part 12 - Safety of Water Power Projects and Project Works, and DSOD per CCR Title 23 - Waters. PG&E is responsible for meeting compliance requirements and obligations to ensure its dams and associated components meet design requirements and can be operated in a reliable and safe manner. For example, dams are required to safely pass the design storm flows and not fail catastrophically for earthquakes up to the design load. Critical components such as spillway gates and LLOs, along with their power supply and backups, need to be operational during dam safety emergencies and routine operations.

Operational and Execution Considerations: Power Generation follows industry best practices as identified in the ISO 55001 certification that it achieved in March 2022. These practices include a prudent risk-informed asset management approach to managing asset risk through the asset lifecycle. Absent appropriate funding to

ensure continued risk reduction and prevention, a serious safety or reliability incident will likely occur in the future. The investments needed to retrofit the dams and components to meet design requirements or for upkeeping do not always have CBR scores greater than one. In general, mitigation projects that are large, complex, and require multiyear design and construction tend to have lower CBRs because of the higher implementation costs.

CBR/Bow Tie Modeling Limitations or Uncertainties: The risk reduction may be underestimated due to data and modeling limitations. An example of such a limitation is that significant deficiencies identified by our regulators that are not satisfactorily mitigated in a timely manner could result in revoking of license and a halt in operations. This is difficult to quantify and currently not captured in the risk modeling.

All projects within the LGUWR-M002 – Spillway Remediation mitigations are essential in ensuring the long-term safe and reliable operations of PG&E dams and are directed at preventing a large uncontrolled water release incident.

Cost

The cost assumptions for this project are based on professional judgment and historic PG&E cost data for similar work.

Major Project Spending Estimates
(Thousands of Nominal Dollars)

CAPITAL

Planning Order	Description	Operative Date	2024 CWIP	2025 Forecast	2026 Forecast	2027 Forecast	2028 Forecast	2029 Forecast	2030 Forecast	CWIP + 2025 - '30 Total
5793568	Spaulding 2 Dam Apron Extension	October 2026	131		2,207					**2,337**

Benefits

This project addresses Recommendation No.13 (R-13) from the Tenth Code of Federal Regulations (CFR) Part 12D Safety Inspection Report for Lake Spaulding Dam No. 2 as required by FERC. The existing concrete apron at Spaulding Dam 2 mitigates erosion immediately downstream of the spillway gates and provides critical protection of upstream scour migration that could undermine the control section. Additionally, maintaining the apron to continue functioning as designed is key. Stabilization of localized blocks below the apron will greatly reduce the potential for further erosion and prolong the life and functionality of the existing apron and spillway at Spaulding Dam 2.

This project is a mitigation to the large uncontrolled water release risk. More specifically, this project is a spillway remediation mitigation (LGUWR-M002 – Spillway Remediations). PG&E implements spillway remediation mitigations (LGUWR-M002) to ensure its dams can safely pass the design flood events.

Implementing LGUWR-M002 mitigation projects will reduce the likelihood of the D1 (flood) risk driver for the specific dam but does not change the safety and financial consequences in an event of dam failure.

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Alternatives Considered

Status Quo: Do nothing – This alternative fails to address Recommendation No.13 (R-13) from the Tenth CFR Part 12D Safety Inspection Report for Lake Spaulding Dam No. 2 as required by FERC. In addition, this alternative would allow spillway flows to continue undercutting and plucking eventually resulting in compromises to dam integrity.

Alternative 1: Spaulding 2 Dam Apron Extension- This is the recommended alternative. This project addresses Recommendation No.13 (R-13) from the Tenth CFR Part 12D Safety Inspection Report for Lake Spaulding Dam No. 2 as required by FERC and provides a reasonable spillway remediation mitigation to the LGUWR risk.

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Project Title: Tiger Creek Abay Dam Replace Gates Hoist

Major Work Categories: 2N **Planning Order Numbers:** 5793557 **Project Start Date: 2022**
Project Completion Date: 2026
Operative Date (only applies to Capital): December 2025

Project Description

Tiger Creek Afterbay Dam is owned and operated by PG&E as part of FERC Project No.137-CA and it's located approximately 16 miles northeast of Jackson, CA. The dam regulates the water discharges from the Tiger Creek Powerhouse (62 MW) and the upstream reservoirs as well as a natural runoff from the 150 square-mile drainage area and diverts water for the West Point Powerhouse (15 MW). The dam is a radius concrete arch structure with gated overpour spillway and consists of an ogee lip divided into ten (10) bays.

Each bay has a 29.5-foot-wide by 12-foot-high radial gate. These 10 radial gates are operated by two spillway hoist cars located on the spillway operating deck. These hoist cars are designated as A and B. Hoist car A was installed in 1931 with an auxiliary hoist was provided in 1941, while Hoist car B was installed in 1999. The travelling/mobile electric motor chain hoists called “Mules”, are each installed inside a car that traverses on the top of the dam on a rail system. The hoist cars are normally connected to two gates and are remotely operated from the Tiger Creek Switching Center via SCADA system. The mules are then moved to the remaining gates which are opened locally to pass flood flows. Any hoist can operate any radial gate, but the cars must be manually positioned over the selected gate. Several safety and operational reliability issues associated with the two existing radial gate hoists at Tiger Creek Afterbay Dam were identified by the area Operations & Maintenance Crew, Dam Safety team, and recent FERC Part 12 Inspection. These issues pose high safety hazards that are jeopardizing the safety of PG&E personnel and the safety of the dam. An Analysis of Alternatives (AoA) was completed in 2022 by MESA Associates, Inc. which has further investigated the issues to allow for a prudent decision on best value going forward and final solution PG&E will select as a preferred alternative to mitigate the issues. The AoA recommends replacing the two existing hoists with 10 individual 15-Ton capacity skid mounted wire rope hoists that will include a variable frequency drive (VFD) to control the motor speed and allow more precise control of the gates; Rittmeyer inclinometer and Rittmeyer rotary position switches to allow for precise control of the gate position; overtravel limit switches to open a mainline contactor or shunt trip the supply breaker to prevent damage to the gate or hoist in the event of a control limit failure, and slack rope limit switches to stop the hoist if the wire rope is slack. In addition, it recommends replacing the existing SCADA system with a new modern automated system that meets the current standard requirements and allows PG&E to remotely operate and control all the 10 hoists from the Tiger Creek Switching Center to increase the visibility of the radial gates operations through better remote equipment monitoring.

Justification

There are only two hoists currently available to operate the 10 radial gates, and to open more than 2 gates, operators must be dispatched on site to move the hoist carts to the other gates. The two hoist cars are old, difficult to move, cumbersome and present ergonomic stresses and safety hazards for PG&E employees. During heavy flow events there is a risk that personnel may be moving hoist cars during a large flood. Working on top of the dam during hazardous weather creates an unsafe condition while operating the spillway hoist cars. Lightning is also a hazard on top of the dam during storms. In the past, severe weather has caused access road landslide failures resulting in delays accessing the dam which present a dam safety concern due to slow response time to operate the gates. Approximately 10 hours are required to open all 10 gates after personnel arrives at the dam. Reliable operation of the spillway gates is critical to the safety of the dam and the

safety of individuals downstream from the dam due to a potential uncontrolled release of the water. This dam has a small storage capacity. This makes timely and reliable operation of the spillway gates critical to the safety of the dam. A recent FERC Part 12 inspection recommended adding monitoring capability to the spillway gate hoists.

Additionally, this project is a mitigation to the Large Uncontrolled Water Release (LGUWR) risk. More specifically, this project is part of the Spillway (M002 – Spillway Remediation) projects included in PG&Es 2024 Risk Assessment and Mitigation Phase (RAMP) filing. PG&E is responsible for maintaining the spillways as required by the PG&E Dam Safety Program. This program is mandated by Federal and State compliance requirements which alignments with the requirement to maintain operational capacity to operate the dam safely to keep the public safety and to prevent harm to public and environmental resources. This program follows the FERC engineering guidelines and DSOD requirements.

PG&E's risk mitigation strategies are selected to ensure that safety remains PG&E's top priority even when the quantitative modelling indicates the costs are higher than the modeled value of risk reduction**.** Other factors are considered when selecting mitigations, including the following:

Compliance: PG&E dams are regulated by two governmental agencies: FERC per Title 18 - Conservation of Power and Water Resources, Part 12 - Safety of Water Power Projects and Project Works, and DSOD per CCR Title 23 - Waters. PG&E is responsible for meeting compliance requirements and obligations to ensure its dams and associated components meet design requirements and can be operated in a reliable and safe manner. For example, dams are required to safely pass the design storm flows and not fail catastrophically for earthquakes up to the design load. Critical components such as spillway gates and LLOs, along with their power supply and backups, need to be operational during dam safety emergencies and routine operations.

Operational and Execution Considerations: Power Generation follows industry best practices as identified in the ISO 55001 certification that it achieved in March 2022. These practices include a prudent risk-informed asset management approach to managing asset risk through the asset lifecycle. Absent appropriate funding to ensure continued risk reduction and prevention, a serious safety or reliability incident will likely occur in the future. The investments needed to retrofit the dams and components to meet design requirements or for upkeeping do not always have CBR scores greater than one. In general, mitigation projects that are large, complex, and require multiyear design and construction tend to have lower CBRs because of the higher implementation costs.

CBR/Bow Tie Modeling Limitations or Uncertainties: The risk reduction may be underestimated due to data and modeling limitations. An example of such a limitation is that significant deficiencies identified by our regulators that are not satisfactorily mitigated in a timely manner could result in revoking of license and a halt in operations. This is difficult to quantify and currently not captured in the risk modeling.

All projects within the LGUWR-M002 – Spillway Remediation mitigations are essential in ensuring the long-term safe and reliable operations of PG&E dams and are directed at preventing a large uncontrolled water release incident.

Cost

The cost assumptions for this project are based on professional judgment and historic PG&E cost data for similar work.

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Major Project Spending Estimates
(Thousands of Nominal Dollars)

CAPITAL

Planning Order	Description	Operative Date	2024 CWIP	2025 Forecast	2026 Forecast	2027 Forecast	2028 Forecast	2029 Forecast	2030 Forecast	CWIP + 2025 - '30 Total
5793557	Tiger Creek Abay Dam Replace Hoist	December 2025	5,588	5,257						**10,845**

Benefits

- Potential avoidance of future O&M expense cost increases associated with maintaining this aging equipment.
- Reduction in the risk of a LGUWR.
- Personnel safety as gates can be opened and closed remotely during storm events rather than personnel needing to operate each gate on the dam.

Alternatives Considered

Status Quo: (Do Nothing) - This alternative is not recommended given that the age and difficulty of procuring replacement parts for the existing gates. This alternative results in an increase in future O&M expense cost associated with maintaining this aging equipment. It also does not address the current safety risks of operating this aging equipment. It also does not reduce the risk of a LGUWR.

Alternative 1: Replace Gate Hoists – This is the recommended alternative. This alternative avoids future O&M expense cost increases associated with maintaining this aging equipment. This alternative also addresses personnel safety as gates can be opened and closed remotely during storm events rather than personnel needing to operate each gate on the dam. It also reduces the risk of a LGUWR.

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Project Summary

Project Title: Upper Peak Mitigate Seismic Deformation

Major Work Categories: 2N **Planning Order Numbers:** 5802821 **Project Start Date:** September 2023
Project Completion Date: May 2028
Operative Date (only applies to Capital): December 2027

Project Description

Pacific Gas and Electric Company (PG&E) performed preliminary liquefaction triggering and seismic deformation analysis of the Upper Peak Lake Dam embankment based on existing data from a geotechnical investigation. Results of the analyses indicate that upstream portions of the embankment are likely to experience liquefaction and significant deformation under the postulated seismic event. As a safety precaution, pursuant to the California Department of Water Resources, Division of Safety of Dams (DSOD) and the Federal Energy Regulatory Commission (FERC) guidance, PG&E has temporarily lowered the maximum water storage capacity of the reservoir. PG&E's water rights may be forfeited if the storage restriction is maintained for longer than 5 years without demonstrable progress towards restoring the operational capacity of the reservoir. The analysis also informed an analysis of alternatives to identify feasible long-term mitigation measures. PG&E has identified viable options and initiated this project to mitigate seismic deformation of the upstream embankment of Upper Peak Lake Dam.

The project scope will consist of design and construction of a two-bench rockfill buttress system to the upstream embankment slope. The rockfill footprint would extend into the reservoir, which would require relocating the Low-Level Outlet (LLO) intake structure roughly 25 feet upstream of its current location and extending the LLO pipe accordingly. The valve controls would also be reconfigured to accommodate the intake relocation and change in slope. The foundation for the rockfill would require removal of accumulated silts/sands and overburden soils to competent bedrock.

Justification

The project is needed to reduce the potential for liquefaction because of seismic activity, to resume normal operation of normal minimum water surface elevation at 6607.4 feet to reclaim storage/capacity for power generation. Also included are improvements to the access road to the left abutment along the upper bench of the new buttress resulting in more reliable access to the site during inclement weather. PG&E's commitment to the DSOD and FERC is to complete construction by the end of 2027.

Additionally, this project is a mitigation to the Large Uncontrolled Water Release (LGUWR) risk. More specifically, this project is part of the Seismic Retrofit (LGUWR-M003 – Seismic Retrofit) mitigation projects included in PG&Es 2024 Risk Assessment and Mitigation Phase (RAMP) filing. PG&E's dams are located near known faults and these mitigation projects are needed to ensure the dams will not catastrophically fail for earthquakes with magnitudes up to their design level.

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The CBR for LGUWR-M003 is 0.4 PG&E's risk mitigation strategies and projects within those strategies are selected to ensure that safety remains PG&E's top priority even when the quantitative modelling indicates the costs are higher than the modeled value of risk reduction**.** Other factors are considered when selecting mitigations, including the following:

Compliance: PG&E dams are regulated by two governmental agencies: FERC per Title 18 - Conservation of Power and Water Resources, Part 12 - Safety of Water Power Projects and Project Works, and DSOD per CCR Title 23 - Waters. PG&E is responsible for meeting compliance requirements and obligations to ensure its dams and associated components meet design requirements and can be operated in a reliable and safe manner. For example, dams are required to safely pass the design storm flows and not fail catastrophically for earthquakes up to the design load. Critical components such as spillway gates and LLOs, along with their power supply and backups, need to be operational during dam safety emergencies and routine operations.

Operational and Execution Considerations: Power Generation follows industry best practices as identified in the ISO 55001 certification that it achieved in March 2022. These practices include a prudent risk-informed asset management approach to managing asset risk through the asset lifecycle. Absent appropriate funding to ensure continued risk reduction and prevention, a serious safety or reliability incident will likely occur in the future. The investments needed to retrofit the dams and components to meet design requirements or for upkeeping do not always have CBR scores greater than one. In general, mitigation projects that are large, complex, and require multiyear design and construction tend to have lower CBRs because of the higher implementation costs.

CBR/Bow Tie Modeling Limitations or Uncertainties: The risk reduction may be underestimated due to data and modeling limitations. An example of such a limitation is that significant deficiencies identified by our regulators that are not satisfactorily mitigated in a timely manner could result in revoking of license and a halt in operations. This is difficult to quantify and currently not captured in the risk modeling.

All projects within the LGUWR-M003 – Seismic Retrofit mitigations are essential in ensuring the long-term safe and reliable operations of PG&E dams and are directed at preventing a large uncontrolled water release incident.

Cost

The cost assumptions for this project are based on professional judgment and historic PG&E cost data for similar work.

Major Project Spending Estimates
(Thousands of Nominal Dollars)

CAPITAL

Planning Order	Description	CBR	Operative Date	2024 CWIP	2025 Forecast	2026 Forecast	2027 Forecast	2028 Forecast	2029 Forecast	2030 Forecast	CWIP + 2025 - '30 Total
5802821	Upper Peak Mitigate Seismic Deformation	2.2	December 2027	307		-102	3,749	101			**4,259**

Benefits

Currently, there is a reservoir restriction to not exceed 4 feet below the crest of the dam. This restriction

impacts downstream powerhouse energy production due to the lack of water being conveyed from the reservoir to the powerhouses. This results in power replacement costs for customers. These restrictions also do not allow third party water agencies to purchase water for consumption or irrigation.

This project is a mitigation to the large uncontrolled water release risk. More specifically, this project is a seismic mitigation (LGUWR-M003 – Seismic Retrofits). PG&E implements seismic retrofit mitigations (LGUWR M003) to ensure dams and components will not fail under the seismic design loads. Implementing LGUWR-M003 mitigation projects will reduce the likelihood of the D2 (seismic) risk driver for the specific dam but does not change the safety and financial consequences in an event of dam failure. The CBR for LGUWR-M003 is 0.4.

Alternatives Considered

Status Quo: Do Nothing - This is not an acceptable alternative as it impacts downstream powerhouse energy production. This results in power replacement costs for customers. This alternative also does not allow third party water agencies to purchase water for consumption or irrigation. This alternative does not reduce the risk of a LGUWR.

Alternative 1: Upper Peak Mitigate Seismic Deformation- This is the recommended alternative. The current reservoir limits the amount of water conveyed from the reservoir to powerhouses downstream, which in turn, adversely affects downstream power generation. In other words, eliminating the current water level restrictions reduces the power replacement costs borne by customers. Removing the reservoir restrictions also allows third party water agencies to purchase water for consumption or irrigation. This alternative also reduces the LGUWR risk.

Alternative 2: Remove the dam- This alternative is not recommended as it eliminates downstream powerhouse energy production. This results in power replacement costs for customers.

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Project Title: Enhanced Asset Management Programs

Major Work Categories: AX, AB, KJ
Planning Order Numbers: 5280074, 5282972, 5284352, 5286173, 5286174, 5286176, 5286984, 5286985, 5286986, 5280128, 5286572
Project Start Date: 2024
Project Completion Date: Various
Operative Date (only applies to Capital): n.a. - expense

Project Description

This program is an expansion of PG&E Hydro Asset Management activities to conduct additional investigations and inspections to enhance condition assessments of dam and civil structures and powerhouse buildings; develop improved risk models for water release from canals and penstocks including environmental impacts; implement new detection technologies in the early identification of failure conditions in hydro structures; and expand the types and locations of previously inaccessible features inspected.

The piloting of new technological programs including remote operated vehicles and aerial drones to increase accessibility at remote locations will improve detection capability while reducing the exposure of field staff to challenging or dangerous locations. This program also funds maintenance focused engineering inspections and repairs of critical structures using standard construction techniques beyond the typical capabilities of the maintenance staff. Additionally, PG&E plans to pilot drone inspections for concrete dam faces to provide detail mapping and continue condition assessment of hard to access locations.

Vegetation Management Program –

PG&E manages and controls vegetation for all hydro assets including maintenance control over the trees that impact dams and water conveyance systems. The Program includes inspections, vegetation removal and cleanup, data collection, and SAP tracking. The removal and maintenance of this vegetation is necessary based on FERC licensing requirements, and Public Resource Code (PRC), Forest Service Use Agreements, and County Codes. Some of these requirements are documented in PG-2716P-02, PG-2716P-03 and PRC 4291. This work is performed at all dams and many canals, roads, penstocks, buildings etc. depending on availability of funds. The work includes many facets of vegetation control: 1) removal of low-lying vegetation, brush, and trees that inhibit access to facilities creating increased risk due to the inability for inspections and lack of license compliance, removal of downed shoreline vegetation to reduce the risk of impacts to dams, log booms and spillways, and 2) creation and maintenance of defensible space adjacent buildings, roads, service drops, etc. to reduce the risk of catastrophic wildfire and comply with PRC and county codes.

Integrated Rodent Management –

Hydro facilities face significant operational and maintenance challenges caused by small mammal activity, which undermines critical infrastructure such as earth embankment dams, canals, and other water conveyance systems. These rodents, including burrowing species, create extensive tunnels and mounds that compromise structural integrity, increased maintenance demands, and pose risks to the safe and efficient operation of hydro systems. Left unchecked, these activities can lead to costly repairs, reduced system efficiency, and shorter infrastructure lifespans.

This project focuses on the implementation of an Integrated Rodent Management Program (IRMP) to mitigate the impacts of rodent activity on hydro facilities. The program integrates multiple control strategies, combining habitat modification, rodenticides, and non-chemical treatments to address active infestations and prevent

future damage. Key components of the program include the following: timing and targeting control measures, integrated pest management approach, non-chemical treatment solutions, rodent applications, continue monitoring and assessments.

The IRMP will protect critical hydro infrastructure from damage caused by rodent activity, prevent future increases in maintenance costs and extend the longevity of facilities, ensure compliance with the Federal Energy Regulatory Commission (FERC) by maintaining the structural integrity of regulated assets and adhering to best management practices, ensure compliance with environmental regulations to minimize risks to non-target species, promote safe and reliable operations of hydro systems through proactive and sustainable pest management practices.

This comprehensive approach ensures that rodent related risks are effectively managed, safeguarding the integrity and performance of hydro facilities while maintaining ecological balance.

Justification

This program addresses risk areas not otherwise identified in the 2023 GRC. It addresses new risk areas such as Water Conveyance System Failure and Water Delivery Failure in addition to expanding the services of programs like Hydro Vegetation Management to directly address watershed vegetation concerns like spillway obstruction and water conveyance damage. The piloting of new technological program elements will improve detection capability.

Vegetation Management Program –

The work is required under the FERC Licenses PG&E owns, PRC, County Codes and various agreements with agencies such as the Forest Service. To meet these requirements, PG&E requires further expansion of this program and oversight to manage the risk programmatically. This program wasn't formally developed in previous GRC filings.

In addition to compliance and safe, reliable operations of PG&E facilities, much of this scope of work can be directly tied to one of the Company Stand, "Catastrophic Wildfires Shall Stop". The creation of defensible space around buildings and roads reduces the risk of a fire ignition event within those areas by removing the vegetative fuel load. The Power Generation vegetation management program intends to ensure public safety and adheres to the California Public Resource Code Section 4291 (under the CA Department of Forestry and Fire Protection).

CA PRC 4291 is a section of the California Public Resources Code that outlines requirements for individuals who own, lease, control, operate, or maintain buildings or structures in fire-prone areas, including mountainous, forest-covered, brush-covered, and grass-covered lands. These individuals must take specific actions to prevent fire hazards.

Rodent Abatement Program –

Investing in an Integrated Rodent Management Program is essential for mitigating infrastructure risks and ensuring cost effective facility maintenance. Rodent burrowing compromises the integrity of earth embankment dams, canals, and levees, leading to seepage, slope instability, and potential dam failure. These structural weaknesses increase the risk of overtopping, internal erosion, and catastrophic breaches, posing threats to public safety and regulatory compliance. Failure to manage rodent activity could result in operational shutdowns, liability costs, and non-compliance with FERC requirements. Proactive rodent control significantly reduces long-term infrastructure costs. Routine habitat modification, rodenticides, and monitoring are far more cost effective than emergency embankment repairs or large-scale erosion control. Preventative measures

extend asset lifespan, maintain operational reliability, and avoid regulatory fines. Rodent management is a critical risk mitigation strategy that safeguards hydro infrastructure, ensures regulatory compliance, and prevents costly emergency interventions. Neglecting rodent control increases the likelihood of structural failure, financial losses, and operational disruptions.

Additionally, planning orders 5287174, 5284352, 5280074, and 5286985 are projects that help to manage the Large Uncontrolled Water Release (LGUWR) risk. More specifically, these projects are part of the Maintenance (LGWUR-C001 – Maintenance) control projects or foundational Dam Safey (LGUWR-F001- Dam Safety Program) projects included in PG&Es 2024 Risk Assessment and Mitigation Phase (RAMP) filing.

The CBR for LGUWR-C001 is 0.4. PG&E's management of risk ensures that safety remains PG&E's top priority even when the quantitative modelling indicates that projects costs are higher than the modeled value of risk reduction**.** Other factors are considered when selecting projects and include the following:

Operational and Execution Considerations: Most identified concrete repair locations, drain inspections, vegetation management activities and rodent abatement activities are proactive operations and maintenance risk mitigations to ensure continued safe operation of the dam. O&M proactive risk mitigation actions are dam asset owners' function to ensure continued safe and operating dams as identified in the ISO 55001 certification, achieved in March 2022. These practices include prudent risk- informed asset management approach to managing asset risk.

Compliance Requirement: FERC Licenses require adequate operations & maintenance (Hydro). CFR Title 18 - Conservation of Power and Water Resources, Part 12 - Safety of Water Power Projects and Project Works, requires a FERC licensee to use sound and prudent engineering practices in any action relating to the design, construction, operation, maintenance, use, repair, or modification of a water power project or project works (Hydro). Since FERC and DSOD conduct annual inspections of the dams, some of the identified patching efforts are formal recommendations from the inspection reports. Some of the recommendations from the FERC/DSOD inspection reports require a formal regulatory Plan and Schedule communication to be submitted for action and in response to the annual inspection reports, hence a regulatory commitment.

CBR/Bow Tie Modeling Limitations or Uncertainties: The risk reduction may be underestimated due to data and modeling limitations. An example of such a limitation is that significant deficiencies identified by our regulators that are not satisfactorily mitigated in a timely manner could result in revoking of license and a halt in operations. This is difficult to quantify and currently not captured in the risk modeling.

All LGUWR-C001 – Maintenance and LGUWR-F001 – Dam Safety projects are essential in ensuring the long-term safe and reliable operations of PG&E dams.

Cost

The cost assumptions for these projects are based on the professional judgment of the engineers with this type of work and historic PG&E cost data for similar work.

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Major Project Spending Estimates
(Thousands of Nominal Dollars)

EXPENSE

Planning Order	Description	CBR	Operative Date	2024 CWIP	2025 Forecast	2026 Forecast	2027 Forecast	2028 Forecast	2029 Forecast	2030 Forecast	CWIP + 2025 - '30 Total
5280074	PG Spillway Vegetation Management	0.07	n.a.	n.a.			3,231	n.a.	n.a.	n.a.	**3,231**
5280128	PGEN Training Crafting Proficiency	n.a.	n.a.	n.a.	1,140	1,185	2,500	n.a.	n.a.	n.a.	**4,825**
5282972	AM: Canal Blitz	n.a.	n.a.	n.a.	3,000			n.a.	n.a.	n.a.	**3,000**
5284352	PG Dam Rodent Abatement	1.5	n.a.	n.a.			1,571	n.a.	n.a.	n.a.	**1,571**
5286173	Penstock Inspection Program	n.a.	n.a.	n.a.	1,100			n.a.	n.a.	n.a.	**1,100**
5286174	LLO & Radial Gate Inspections	Foundational	n.a.	n.a.	1,100			n.a.	n.a.	n.a.	**1,100**
5286176	Water Conveyance Inspections	n.a.	n.a.	n.a.	900			n.a.	n.a.	n.a.	**900**
5286984	AM: PH Civil AF Prog Dvlpmt-Cnd Assess	n.a.	n.a.	n.a.	100	102	500	n.a.	n.a.	n.a.	**702**
5286985	DSP: Specialized Inspections: Concr	Foundational	n.a.	n.a.	100	102	300	n.a.	n.a.	n.a.	**502**
5286986	Hydro Veg Prgrm Development - GIS	n.a.	n.a.	n.a.			1,100	n.a.	n.a.	n.a.	**1,100**

Benefits

Program activities provide a reduction in risk due to system condition failures that cannot be observed through regular inspection or instrumentation. Technological innovation has the opportunity for reducing future maintenance cost increases as access to remote locations is reduced from current levels.

The additional benefit is implementing a formal vegetation management program to ensure Power Generation stays in compliance, reducing the risk of impacts to our facilities, providing safe and reliable operation of our facilities, and reducing the risk of catastrophic wildfire.

Alternatives Considered

Status Quo: Do not fund this work – This alternative is not recommended. This alternative does not reduce risk due to system condition failures that cannot be observed through regular inspection or instrumentation. It also does not provide the opportunity to reduce future increases in maintenance costs. This alternative also risks Power Generation from staying in compliance and reducing the risk of catastrophic wildfire.

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Alternative 1: Fund this AM program work – This is the recommended alternative. This alternative reduces the risk of system condition failures that cannot be observed through regular inspection or instrumentation; provides the opportunity to reduce future increases in maintenance costs; helps Power Generation stay in compliance and reduces the risk of catastrophic wildfire.

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Project Title: Relief Dam-Resurface Upstream Liner
Major Work Categories: 2N
Planning Order Numbers: 5798438
Project Start Date: August 2021
Project Completion Date: December 2031
Operative Date (only applies to Capital): December 2031

Project Description

The project aims to provide vehicle access to Relief Reservoir by improving and extending the existing FS 5N01 road from Hwy 108 to the Reservoir and restore the function of the dam's upstream gunite liner by adding a geomembrane liner to reduce seepage levels. Currently, the dam is only accessible by foot or helicopter. Providing vehicle access to Relief Reservoir will allow for routine maintenance access and ensure that the site is accessible under hazardous and emergent conditions. The restoration of the upstream gunite liner and seepage mitigations will ensure regulatory compliance and extend the service life of the dam for another 50 years. Installation of the liner on the upstream dam face will require transport of significant materials, equipment, and personnel to and from the dam.

Relief Dam Upstream Liner and Debris Buildup on Upstream Toe of Dam



Justification

The gunite facing over the concrete face was constructed between 1972 and 1976 and exhibits severe signs of degradation including spalling, exposed wire mesh, delamination, and voids. The overall conditions of the concrete liner, facing and subvertical joint have been identified as contributing factors related to elevated levels of seepage in recent years based on data from monitoring weirs at the dam. Leakage is being monitored through two weirs, S1-A and S1-B, that were constructed near the downstream toe of the dam in 1983. In 2019, the Threshold and Action Levels were exceeded for both S1-A and S1-B. These thresholds are set by DSOD for high hazard dams. To restore the serviceability of this high-hazard dam, a new geomembrane liner

will be installed on the upstream face.

Additionally, this project is a mitigation to the large uncontrolled water release (LGUWR) risk. More specifically, this project is a part of the Internal Erosion (LGUWR-M001 – Internal Erosion mitigation projects included in PG&Es 2024 Risk Assessment and Mitigation Phase (RAMP) filing. This project mitigates the risk of dam failure under normal operating conditions.

The CBR for LGUWR-M001 is 0.3. PG&E's risk mitigation strategies and projects within those strategies are selected to ensure that safety remains PG&E's top priority even when the quantitative modelling indicates the costs are higher than the modeled value of risk reduction**.** Other factors are considered when selecting mitigations, including the following:

Compliance: PG&E dams are regulated by two governmental agencies: FERC per Title 18 - Conservation of Power and Water Resources, Part 12 - Safety of Water Power Projects and Project Works, and DSOD per CCR Title 23 - Waters. PG&E is responsible for meeting compliance requirements and obligations to ensure its dams and associated components meet design requirements and can be operated in a reliable and safe manner. For example, dams are required to safely pass the design storm flows and not fail catastrophically for earthquakes up to the design load. Critical components such as spillway gates and LLOs, along with their power supply and backups, need to be operational during dam safety emergencies and routine operations.

Operational and Execution Considerations: Power Generation follows industry best practices as identified in the ISO 55001 certification that it achieved in March 2022. These practices include a prudent risk-informed asset management approach to managing asset risk through the asset lifecycle. Absent appropriate funding to ensure continued risk reduction and prevention, a serious safety or reliability incident will likely occur in the future. The investments needed to retrofit the dams and components to meet design requirements or for upkeeping do not always have CBR scores greater than one. In general, mitigation projects that are large, complex, and require multiyear design and construction tend to have lower CBRs because of the higher implementation costs.

CBR/Bow Tie Modeling Limitations or Uncertainties: The risk reduction may be underestimated due to data and modeling limitations. An example of such a limitation is that significant deficiencies identified by our regulators that are not satisfactorily mitigated in a timely manner could result in revoking of license and a halt in operations. This is difficult to quantify and currently not captured in the risk modeling.

All projects within the LGUWR-M001 – Internal Erosion mitigations are essential in ensuring the long-term safe and reliable operations of PG&E dams and are directed at preventing a large uncontrolled water release incident.

Cost

The cost assumptions for this project are based on professional judgment of the local engineering and hydro team familiar with this type of work.

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Major Project Spending Estimates
(Thousands of Nominal Dollars)

CAPITAL

Planning Order	Description	CBR	Operative Date	2024 CWIP	2025 Forecast	2026 Forecast	2027 Forecast	2028 Forecast	2029 Forecast	2030 Forecast	CWIP + 2025 - '30 Total
5798438	Relief Dam-Resurface Upstream Liner	0.2	Dec 2031	5,360	3,094	3,080	3,780	18,071	18,098	19,211	70,695

Benefits

This project is a mitigation to the large uncontrolled water release risk. More specifically, this project is an internal erosion mitigation (LGUWR-M001 – Internal Erosion Mitigations). PG&E implements internal erosion mitigations (LGUWR-M001) to minimize the potential for internal erosion failure modes to initiate and develop for earth fill and rockfill embankment dams. Implementing LGUWR-M001 mitigation projects will reduce the likelihood of the D3 (failure under normal operations) risk driver for this dam but does not change the safety and financial consequences in an event of dam failure. The CBR for LGUWR M001 is 0.3.

Alternatives Considered

Status Quo: Do Nothing – This alternative is not recommended. Under this alternative, PG&E would continue local dam patching at an assumed rate of 400 square feet (sf) per year to meet minimum DSOD commitments. This effort is expected to take 23 years. This effort assumes a total of 6,480 sf of repairs and assumes a large capital project would still need to occur after the patches reach their useful life of 20 years.

Alternative 1: Install a geomembrane liner on the upstream face of the dam – This is the recommended alternative. This alternative will successfully mitigate the large uncontrolled water release risk associated with this dam. Construction is slated for two seasons (May-October). This alternative provides a highly impermeable liner, flexible with dam deformations, effective seepage mitigation, and minimal liner demolition and disposal. Road improvements would allow the passage of construction equipment to access the dam.

Alternative 2: Local patching – This alternative is not recommended. This alternative would involve making discrete repairs to approximately 5,000 sq ft of the dam face. The patching effort would take place over two seasons (May-October). The alternative provides the lowest up-front costs with good durability against abrasions and impacts. This alternative was not selected because it leaves most of the aging gunite liner in place, diminishing the protection of the dam face. It also involves significant long-term repair/maintenance costs and is subject to further cracking due to dam deformations. In this alternative it is assumed that a large capital project (with a similar Geomembrane Liner assumed) would need to be completed after 20 years.

Alternative 3: Full shotcrete overlay – This alternative is not recommended. This alternative involves selective removal of deteriorated gunite and applying a reinforced shotcrete liner over the entire upstream face of the dam over two seasons (May-October). This alternative provides durable facing, good seepage mitigation and a long service life. The alternative was not selected due to its excessive cost, congested construction schedule, material subject to cracking due to dam deformations and freeze thaw, and the inability to mitigate seepage at the subvertical joint in the dam.

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Project Title: Lower Bucks Spillway Restoration SAIP
Major Work Categories: 3H
Planning Order Number: 5794031
Project Start Date:
Project Completion Date:
Operative Date (only applies to Capital): 10/15/2025

Project Description

Bucks Diversion Dam is a 99-foot-tall slender concrete arch dam originally constructed circa 1928. The dam utilizes two ungated spillways; an emergency spillway consisting of five 20-foot overpour bays that spill over the crest of the dam, and a concrete service spillway with a 100-foot ogee crest that spills over the left abutment thrust block of the dam.

The Lower Bucks Spillway Rehabilitation SAIP project includes rehabilitation and reconstruction of the service spillway to accommodate the published design flow and repair the known deficiencies as outlined in the 2017 detailed spillway assessment report. Construction is planned to be completed in two phases, over the 2024 and 2025 construction seasons. The spillway rehabilitation includes the following activities:

- Development of an access road and crane pad at the crest of the spillway.
- Vegetation clearing on the slopes above the spillway, and installation of rockfall netting.
- Installation of a temporary LLO diversion and a check dam to dewater the plunge pool during work activities.
- Demolition of the existing spillway chute and walls.
- Construction of the new spillway chute and wall.
- Installation of the left wall deflector panels.
- Repairs to the remaining portions of the right-side wall.
- Installation of the water collection and drainage systems.
- Demobilization and clean up.

Justification

In response to a FERC request, PG&E prepared a Focused Spillway Assessment report, dated December 29, 2017. The assessment reports the service spillway chute is severely damaged and in need of restoration. Most of the shotcrete overlay that was constructed over the original concrete surface has become delaminated, severely cracked and eroded, and is missing in many areas, particularly along the downstream toe. This project will rehabilitate the service spillway to restore water tightness, prevent risk of further delamination, and protect the underlying rock from erosion.

Additionally, this project is a mitigation to the large uncontrolled water release (LGUWR) risk. More specifically, this project is a part of the Spillway Remediation LGUWR-M002 – Spillway Remediation mitigation projects included in PG&Es 2024 Risk Assessment and Mitigation Phase (RAMP) filing. PG&E implements Spillway Remediation mitigations (LGUWR-M002) to ensure its dams can safely pass the design flood events. Mitigation projects for LGUWR-M002 include improvements to or rehabilitation of spillway control structures, spillway chutes, gates, log booms, and operators.

PG&E's risk mitigation strategies and projects within those strategies are selected to ensure that safety remains PG&E's top priority even when the quantitative modelling indicates the costs are higher than the modeled value of risk reduction. Other factors are considered when selecting mitigations, including the following:

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Compliance: PG&E dams are regulated by two governmental agencies: FERC per Title 18 - Conservation of Power and Water Resources, Part 12 - Safety of Water Power Projects and Project Works, and DSOD per CCR Title 23 - Waters. PG&E is responsible for meeting compliance requirements and obligations to ensure its dams and associated components meet design requirements and can be operated in a reliable and safe manner. For example, dams are required to safely pass the design storm flows and not fail catastrophically for earthquakes up to the design load. Critical components such as spillway gates and LLOs, along with their power supply and backups, need to be operational during dam safety emergencies and routine operations.

Operational and Execution Considerations: Power Generation follows industry best practices as identified in the ISO 55001 certification that it achieved in March 2022. These practices include a prudent risk-informed asset management approach to managing asset risk through the asset lifecycle. Absent appropriate funding to ensure continued risk reduction and prevention, a serious safety or reliability incident will likely occur in the future. The investments needed to retrofit the dams and components to meet design requirements or for upkeeping do not always have CBR scores greater than one. In general, mitigation projects that are large, complex, and require multiyear design and construction tend to have lower CBRs because of the higher implementation costs.

CBR/Bow Tie Modeling Limitations or Uncertainties: The risk reduction may be underestimated due to data and modeling limitations. An example of such a limitation is that significant deficiencies identified by our regulators that are not satisfactorily mitigated in a timely manner could result in revoking of license and a halt in operations. This is difficult to quantify and currently not captured in the risk modeling.

All projects within the LGUWR-M002 – Spillway Remediation mitigations are essential in ensuring the long-term safe and reliable operations of PG&E dams and are directed at preventing a large uncontrolled water release incident.

Cost

Major Project Spending Estimates
(Thousands of Nominal Dollars)

CAPITAL

Planning Order	Description	Operative Date	CWIP 2024 Recorded	2025 Fore-cast	2026 Fore-cast	2027 Fore-cast	2028 Fore-cast	2029 Fore-cast	2030 Fore-cast	CWIP + 2025-2030 Forecast
5794031	Lower Bucks Spillway Restoration	October 2025	12,687	10,421	194					**23,302**

Benefits

- New spillway designed to achieve its originally stated capacity.
- Increased safety and reliability, especially during high flow events.
- Reduces future cost increases for maintenance and repairs to keep the spillway serviceable.

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Alternatives Considered

Status Quo – Do nothing- This alternative is not recommended since FERC has requested that PG&E put together a repair plan to address the issues/damage with the spillway.

Alternative 1: Repair – This alternative is not recommended due to the extent of the damage to the existing spillway.

Alternative 2: Replace – This is the recommended alternative. Spillway Restoration will extend the useful life of the spillway. The new spillway will be designed to achieve its originally stated capacity. This alternative results in increased safety and reliability, especially during high flow events. It also reduces future cost increases for maintenance and repairs to keep the spillway serviceable.

Alternative 3: Retire – This alternative is not recommended as it results in the removal of the dam.