

Company: San Diego Gas & Electric Company (U 902 M)  
Proceeding: 2024 General Rate Case – Track 3  
Application No.: A.22-05-016  
Exhibit: SDG&E-T3-WMPMA-06-E

**ERRATA SUPPLEMENTAL TESTIMONY OF  
JENNIFER KAMINSKY  
ON BEHALF OF SAN DIEGO GAS & ELECTRIC COMPANY  
(TRACK 3 – ASSET MANAGEMENT AND INSPECTIONS)**

**BEFORE THE PUBLIC UTILITIES COMMISSION  
OF THE STATE OF CALIFORNIA**



**MarchApril 2026**

## TABLE OF CONTENTS

I.	INTRODUCTION AND QUALIFICATIONS .....	1
II.	SDG&E’S ASSET MANAGEMENT AND REPAIR PROGRAMS .....	4
III.	SPECIFIC ASSET MANAGEMENT AND INSPECTION PROGRAM DETAILS .....	16
1.	DISTRIBUTION OVERHEAD DETAILED INSPECTIONS .....	16
2.	DETAILED INSPECTIONS OF TRANSMISSION EQUIPMENT (DISTRIBUTION UNDERBUILD).....	20
3.	INFRARED INSPECTIONS OF DISTRIBUTION INFRASTRUCTURE .....	22
4.	INTRUSIVE POLE INSPECTIONS .....	26
5.	HFTD TIER 3 INSPECTIONS.....	31
6.	PATROL INSPECTIONS OF DISTRIBUTION EQUIPMENT .....	34
7.	DRONE INVESTIGATION ASSESSMENT AND REPAIR PROGRAMS (DIAR AND RIDI) .....	38

Appendix A – Distribution Inspection Analysis Report

1 **ERRATA SUPPLEMENTAL TESTIMONY OF JENNIFER KAMINSKY**  
2 **ON BEHALF OF SAN DIEGO GAS & ELECTRIC COMPANY**

3 **I. INTRODUCTION AND QUALIFICATIONS**

4 **Q. Ms. Kaminsky, please state your name and explain your involvement in SDG&E's**  
5 **Track 3 cost recovery proceeding.**

6 A. My name is Jennifer Kaminsky. I am the Senior Manager of Electric Assets and  
7 Compliance at San Diego Gas & Electric Company (SDG&E). In that role, I oversee SDG&E's  
8 asset management and inspection programs for distribution electric facilities, joint use  
9 management, California Public Utilities Commission (Commission or CPUC) incident reporting  
10 and investigations, and select electric distribution inspection execution. From 2019-2022, I was  
11 the Project Manager of the Drone Investigation Assessment and Repair (DIAR) program. I  
12 continue to oversee the management of SDG&E's DIAR program and the Risk-Informed Drone  
13 Inspection (RIDI) program that began in 2023 as further discussed below. I have prepared  
14 narrative related to electric infrastructure drone inspections and asset management and inspection  
15 program for SDG&E Wildfire Mitigation Plans (WMP) since 2019, and I supported the Wildfire  
16 Mitigation department in WMP compliance and implementation.

17 **Q. Ms. Kaminsky, please summarize your professional experience.**

18 A. I have a Juris Doctorate with a focus in Environmental & Energy Law from Chicago-  
19 Kent College of Law, a Bachelor of Science in Environmental Policy and Behavior from the  
20 University of Michigan and am a Licensed Attorney. I have close to two decades of experience  
21 in the energy sector, overseeing complex electric utility programs, large capital construction  
22 projects, and multi-agency regulatory processes. Prior to starting work at SDG&E, I worked for  
23 an engineering and consulting firm from 2007-2016 and built a strong foundation in  
24 environmental compliance and permitting for complex energy, transmission, and industrial

1 projects and programs. I joined SDG&E in 2016 as a Principal Land Planner / Environmental  
2 Project Manager where I managed environmental compliance for major capital projects,  
3 coordinating across engineering, construction, regulatory agencies, and municipal partners. In  
4 2018, I became a Project Manager for SDG&E where I led high-profile and complex  
5 transmission and substation projects and in 2019, started the DIAR program. In 2021, I took on  
6 the role of Senior Manager of Electric Assets and Compliance, which expanded my management  
7 of electric infrastructure drone inspections into overseeing the implementation of SDG&E's  
8 electric distribution corrective maintenance program. In addition, my department manages the  
9 joint use of our electric assets by third party attachers (including, but not limited to,  
10 communications providers) and provides support in CPUC electric safety incident investigations,  
11 complaints and audits. I am recognized as a trusted subject-matter expert in CPUC investigations  
12 and "Person Most Knowledgeable" in legal matters related to our distribution asset inspections  
13 and maintenance programs, with strong capability to bridge technical, operational, legal, and  
14 regulatory domains.

15 **Q. What is the purpose of your testimony?**

16 A. The purpose of my testimony is to provide clarification and additional details for  
17 SDG&E's Asset Management and Inspections (AM&I) budget categories from 2019 through  
18 2022, as described in Track 2 of SDG&E's General Rate Case, A.22-05-016 ("Track 2"), as well  
19 as provide similar details for costs incurred to implement SDG&E's 2023 Wildfire Mitigation  
20 Plan, as requested in Track 3 of SDG&E's General Rate Case (GRC) ("Track 3"). The  
21 Commission's Final Decision (D.) 26-01-021, addressing SDG&E's Track 2 request, approved  
22 the majority of costs associated with seven initiatives under the AM&I budget category, but

1 reserved the question of the reasonableness of SDG&E’s costs associated with the DIAR  
2 program subject to additional testimony, and required SDG&E to:

- 3 • Submit specific and detailed supplemental testimony addressing both the  
4 inspection and repair costs associated with the DIAR program.
- 5 • Serve supplemental testimony providing a breakdown of all AM&I costs except  
6 circuit ownership on any annual basis for the 2019-2022 period in the following  
7 categories: (1) repair costs, (2) inspection costs, (3) capital expenditures, and (4)  
8 operations and maintenance (O&M) expenses.<sup>1</sup>
- 9 • Provide supplemental testimony providing a breakdown of all AM&I costs for  
10 2023 in the following categories: (1) repair costs, (2) inspection costs, (3) capital  
11 expenditures, and (4) O&M expenses.<sup>2</sup>

12 In accordance with the Commission’s requirements, my testimony and the supporting  
13 workpapers found in SDG&&&E-T3-WMPMA-07-E provide a detailed cost breakdown of  
14 SDG&E’s drone inspection and repair programs in effect from 2019-2022 (DIAR) and 2023  
15 (RIDI), including asset inspections, repairs, and technology to support ongoing cost efficiencies  
16 such as Intelligent Image Processing (IIP) and machine learning. Additionally, my testimony and  
17 workpapers provide the required information and cost breakdown for six additional AM&I  
18 initiatives:

- 19 • Detailed Inspections of Distribution Equipment
- 20 • Detailed Inspections of Transmission Equipment (Distribution Underbuild)
- 21 • Infrared Inspections of Distribution Infrastructure
- 22 • Intrusive Pole Inspections

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<sup>1</sup> D.26-01-021 at 110.

<sup>2</sup> *Id.* at 111 (“In future applications for recovery of asset management and inspection costs and GRCs, SDG&E shall provide additional evidence regarding how inspection programs are coordinated to avoid or account for overlapping activity and associated O&M and capital costs. SDG&E shall also detail the staffing employed, their cost, and the justification for the additional cost in coordination with other inspection programs, including their risk benefit cost ratios.”).

- 1 • HFTD Tier 3 Inspections
- 2 • Patrol Inspections of Distribution Equipment
- 3 • Drone Assessments of Distribution Infrastructure (DIAR) for 2019-2022, and
- 4 Risk Informed Drone Investigations for 2023 (RIDI)

5 For each of these programs, I provide a cost breakdown between the inspections performed for  
6 each of these initiatives and the combined costs associated with repairs resulting from  
7 inspections from 2019-2023. I also provide additional information regarding the justification and  
8 scope of these inspection programs and repairs performed on SDG&E's overhead electric  
9 distribution facilities in the High Fire Threat District (HFTD) and higher risk Wildland Urban  
10 Interface (WUI) areas. In addition, I provide a breakdown and explanation of work performed  
11 related to technology and artificial intelligence/machine learning model development to support  
12 SDG&E's inspection and repair programs, and a breakdown of the costs in this area.

13 My testimony establishes that SDG&E's drone inspection and repair programs were an  
14 invaluable component of SDG&E's wildfire mitigation strategy from 2019-2023, and all costs  
15 associated with these programs, including the associated repairs, are just and reasonable for  
16 recovery.

## 17 **II. SDG&E'S ASSET MANAGEMENT AND REPAIR PROGRAMS**

18 **Q. Generally, can you please describe the intent and governance of SDG&E's Asset**  
19 **Management and Inspection (AM&I) Programs?**

20 A. SDG&E's AM&I Programs are governed by the corporate Asset Management Policy,  
21 which establishes the guiding principles for how SDG&E manages its assets across people,  
22 processes, and technology. The policy explicitly aligns asset management activities with  
23 corporate strategy, regulatory compliance, safety, service quality, and risk-informed  
24 decision-making. Specifically, the purpose of the policy is to:

- 1 • Maintain compliance with regulatory directives and internal standards;
- 2 • Reinforce SDG&E’s commitment to safety and service quality;
- 3 • Enable risk-informed operating decisions and investment allocations; and
- 4 • Optimize asset safety, performance, risk, and cost over the asset lifecycle.

5 Inspection programs function as an integral input to SDG&E’s broader asset management  
6 system rather than as stand-alone activities. My team operates within a structured governance  
7 model with core responsibilities including, but not limited to the following:

- 8 • Oversight of inspection execution;
- 9 • Regulatory reporting and audit support;
- 10 • Governance and oversight of corrective maintenance (*i.e.*, repairs) resulting from  
11 inspection findings; and
- 12 • Quality assurance and quality control (QA/QC) processes.

13 Further details regarding each of SDG&E’s AM&I programs is provided in the sections  
14 below.

15 **Q. How do SDG&E’s AM&I programs operate in the context of SDG&E’s Wildfire**  
16 **Mitigation Plan?**

17 A. SDG&E’s Asset Management Policy expressly requires SDG&E people, process and  
18 technology to incorporate regulatory directives as outlined in Senate Bill (SB) 901 and Assembly  
19 Bill (AB) 1054, and approved regulatory strategies, including inspection enhancements and  
20 expanded inspection programs to address wildfire risk and described in SDG&E’s Wildfire  
21 Mitigation Plans. SDG&E’s suite of inspection programs are used to support wildfire risk  
22 reduction by identifying asset conditions that could contribute to ignition risk, while remaining  
23 grounded in the broader asset management and compliance framework. The Asset Management  
24 Policy is periodically reviewed and updated to account for new requirements and programs.

25 SDG&E’s AM&I programs operate inside the WMP as both: (1) the “baseline”  
26 compliance inspection and repair engine that follows traditional inspection requirements

1 mandated by General Order (GO) 165; and (2) the platform SDG&E uses to add  
2 “enhanced/discretionary” assessments and new technologies focused on wildfire risk reduction—  
3 all organized around identifying conditions, prioritizing work based on risk, completing  
4 corrective actions, and meeting WMP reporting and compliance requirements, and continuous  
5 improvement.

6 SDG&E’s AM&I programs are tracked and reported upon in SDG&E’s WMPs, which  
7 list annual targets related to inspections in the HFTD and other high-risk areas such as the WUI.  
8 Upon the Office of Energy Infrastructure Safety’s (Energy Safety) approval of its WMPs,  
9 SDG&E is required to comply with approved WMP targets pursuant to Public Utilities Code  
10 Section 8386.3 and safety certificate requirements pursuant to Public Utilities Code Section  
11 8389. Consistent with the Commission’s approval of SDG&E’s 2019 WMP, as well as  
12 SDG&E’s Wildfire Mitigation Plan Memorandum Accounts (WMPMA), authorized and actual  
13 costs related to SDG&E’s AM&I programs are tracked in SDG&E’s WMPMA.

14 **Q. Are there specific SDG&E standards governing SDG&E’s AM&I programs?**

15 A. Yes. SDG&E’s Electric Distribution Corrective Maintenance Program (CMP) Manual  
16 and associated Electric Safety Practices and Business Process documents (collectively referred to  
17 SDG&E’s CMP), as well as SDG&E’s approved WMPs outline SDG&E’s internal requirements  
18 related to electric distribution inspections and repairs.

19 **Q. What AM&I programs were included in SDG&E’s CMP from 2019-2023?**

20 A. SDG&E’s CMP was updated in 2018 and 2023 and covers inspection and repair  
21 requirements for distribution electric facilities and streetlights in SDG&E’s entire service  
22 territory. As the CMP applied to facilities covered by the WMP (generally defined as electrical  
23 infrastructure within the HFTD or other high risk areas of the service territory), from 2018-2023,

1 SDG&E's CMP included inspection and repair requirements related to Detailed Overhead  
2 Inspections of Distribution Equipment, Patrol Inspections of Distribution Equipment, Intrusive  
3 Pole Inspections, and HFTD Tier 3 Inspections, as well as repairs resulting from these inspection  
4 programs. The CMP also includes repairs to electric distribution equipment resulting from  
5 transmission inspection findings (referred to as Transmission Inspections of Distribution  
6 Underbuild).

7 In 2023, SDG&E's CMP was updated to transition HFTD Tier 3 Inspections to Risk-  
8 Informed Drone Inspections, as discussed in more detail later in my testimony. All other  
9 inspection and repair requirements for the other inspection programs including Detailed  
10 Overhead Inspections of Distribution Equipment, Patrol Inspections of Distribution Equipment,  
11 Intrusive Pole Inspections, and repairs resulting from these inspection programs continued to be  
12 included in SDG&E CMP.

13 **Q. Which AM&I programs are not included in SDG&E's CMP from 2019-2023?**

14 A. Infrared Inspections of Distribution Equipment and Drone Inspections of Distribution  
15 Equipment performed through DIAR and RIDI were not included in SDG&E's CMP Manual  
16 and internal standards. These inspection programs were developed to address the growing threat  
17 of wildfire risk recognized by SB 901 and AB 1054, and supplemented SDG&E's existing  
18 inspection programs.

19 **Q. Do SDG&E's AM&I programs Reduce Wildfire Risk?**

20 A. Yes. SDG&E's AM&I Programs reduce wildfire risk by identifying and correcting  
21 hazardous asset conditions that could lead to ignition, and by doing so within a structured,  
22 risk-informed, and compliance-driven framework described in SDG&E's WMP.

1 **Q. How do these programs reduce wildfire risk?**

2 A. Inspections alone do not reduce risk; the risk reduction occurs when inspection findings  
3 initiate corrective repairs or are used to provide situational awareness and inform other  
4 mitigation decisions, such as Public Safety Power Shutoffs during extreme fire weather  
5 conditions. Accordingly, AM&I is one component of a layered wildfire mitigation strategy,  
6 operating alongside vegetation management, system hardening, situational awareness, and  
7 operational mitigations.

8 Historically, SDG&E has incorporated the cost of inspections as well as repairs into its  
9 GRC forecasts,<sup>3</sup> to reflect the overall risk reduction benefits of inspections and repairs as a  
10 comprehensive effort.<sup>4</sup> Thus, SDG&E's original presentation of authorized costs in Track 2 and  
11 Track 3 for any AM&I programs included the authorized costs of both inspections and repairs.  
12 The workpapers found in SDG&&&E-T3-WMPMA-07-E prepared in support of my testimony  
13 provide additional detail regarding the breakdown of costs within these programs.

14 **Q. Please provide an overall breakdown of the inspection costs for each of SDG&E's**  
15 **AM&I programs from 2019-2023.**

16 A. The total costs of inspections performed under each respective AM&I program are  
17 included in the table below in direct dollars (\$000s). These costs are O&M expenses associated  
18 with performing inspections. Additional details regarding these costs are provided in my  
19 workpapers found in SDG&&&E-T3-WMPMA-07-E.

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<sup>3</sup> A.17-10-007, Exhibit SDG&E-15-2R, Second Revised Direct Testimony of William Speer on Behalf of SDG&E (Electric Distribution O&M) (May 7, 2018) at WHS-40 through WHS-48.

<sup>4</sup> Per D.26-01-011, SDG&E will present AM&I costs broken down by inspections and repairs in future GRC requests.

**Table JK- ~~14~~ 11:: 2019-2023 Total Inspection Costs Breakdown by Program (Direct \$000s)**

<b>Inspection Type</b>	<b>2019</b>	<b>2020</b>	<b>2021</b>	<b>2022</b>	<b>2023</b>	<b>Total</b>
<b>Drone</b>	\$13,479	\$17,452	\$15,658	\$13,242	\$7,399	<b>\$67,230</b>
<b>Detailed</b>	\$0	\$179	\$362	\$344	\$374	<b>\$1,259</b>
<b>HFTD Tier 3</b>	\$568	\$401	\$352	\$409	\$0	<b>\$1,730</b>
<b>Intrusive</b>	\$1,256	\$886	\$806	\$39	\$108	<b>\$3,095</b>
<b>Infrared</b>	\$98	\$175	\$146	\$159	\$330	<b>\$908</b>
<b>Patrol</b>	\$0	\$295	\$287	\$287	\$331	<b>\$1,200</b>
<b>Total</b>	<b>\$15,401</b>	<b>\$19,388</b>	<b>\$17,611</b>	<b>\$14,480</b>	<b>\$8,542</b>	<b>\$75,422</b>

**Q. Please provide the unit cost per inspection for each program.**

A. The average per pole inspection cost in direct dollars (\$000s) for each inspection type is presented in the table below. Additional details regarding these costs are provided in my workpapers found in SDG&E-T3-WMPMA-07-E.

As seen within the table, as SDG&E’s drone inspection programs matured, SDG&E was able to and continues to realize reduced inspection costs by finding efficiencies and implementing informed program adjustments to reduce costs while maintaining program intent and effectiveness. Changes made based on program learnings that contributed to these cost reductions are discussed throughout my testimony.

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**Table JK- 2:: 2019-2023 Per Pole Inspection Costs Breakdown by Program**

<b>Inspection Type</b>	<b>2019</b>	<b>2020</b>	<b>2021</b>	<b>2022</b>	<b>2023</b>	<b>Average (Based on 2019- 2023 totals)</b>
<b>Drone</b>	\$1,281	\$652	\$678	\$510	\$486	<b>\$662</b>
<b>Detailed</b>	N/A	\$10	\$16	\$19	\$32	<b>\$18</b>
<b>HFTD Tier 3</b>	\$37	\$34	\$30	\$33	\$0	<b>\$34</b>
<b>Intrusive</b>	\$64	\$61	\$92	\$41	\$104	<b>\$69</b>
<b>Infrared</b>	N/A	\$13	\$9	\$13	\$28	<b>\$17</b>
<b>Patrol</b>	N/A	\$3	\$3	\$3	\$4	<b>\$3</b>

Taking the total direct dollar inspection costs across all AM&I programs, including drones, and dividing by the total number of poles within the HFTD and higher risk WUI areas (~90,000 poles), the table below shows the dollars spent to perform inspections on a per pole basis for each of the subject years.

**Table JK- 3: 2019-2023 Total SDG&E Inspection Spend Per HFTD/WUI Pole**

	<b>2019</b>	<b>2020</b>	<b>2021</b>	<b>2022</b>	<b>2023</b>	<b>Average 2019-2023</b>
Cost/Pole	\$171	\$215	\$196	\$161	\$95	<b>\$167</b>

**Q. What factors impact the costs of AM&I inspections?**

A. Factors that drive the cost of inspections include, but are not limited to the following:

- Labor rates, including increases in labor costs over time,
- Vehicle and fuel costs associated with field inspections,
- Costs for equipment, tools and materials needed,
- Vendor costs for inspections performed by contractors, such as wood pole intrusive inspections and drone inspections,
- Support services for public safety, worker safety, and compliance. This support includes, but is not necessarily limited to:
  - Traffic control and flagging support in roadways or populated areas

- 1           -       Helicopter support for limited inspections where ground access is not
- 2                   feasible
- 3           -       Safety or security personnel to support field work when there are hazards,
- 4                   especially employee safety concerns related to hostile customers
- 5           -       Environmental and land support, including biological, Tribal or cultural
- 6                   monitors, for inspections in sensitive areas
- 7           -       Customer coordination resources to manage notifications, access, and
- 8                   impacts
- 9           -       Permitting for both traffic control and where permits or authorization are
- 10                  required (*e.g.*, Department of Defense or United States Forest Service)
- 11       •       In addition, support and coordination is needed for scheduling and dispatch of
- 12                  inspection crews, tracking inspection completion and compliance intervals, and
- 13                  reporting.

14           Many of these costs were subject to significant inflationary pressures due to the economic  
15 conditions present during the COVID-19 pandemic and a period of record inflation from 2020-  
16 2023.

17 **Q.     Please provide any additional details related to the inspection support and cost**  
18 **drivers that were unique for SDG&E’s Drone Inspection Programs, DIAR and RIDI.**

19 A.     Besides the technology needs related to the performance of these inspections that I will  
20 discuss later in this testimony, because DIAR was a new program in 2019, SDG&E had to  
21 develop new technical qualifications, training, and process documents that required additional  
22 support from various groups at SDG&E. All of this work contributed to the costs to start up the  
23 DIAR program.

24           In July 2014, SDG&E became the first utility to receive a Special Airworthiness  
25 Certificate for small Unmanned Aircraft System (UAS), allowing the utility to research, test, and  
26 train flight crews on the UAS in a sparsely populated airspace in Eastern San Diego County.

1 Since that time, SDG&E's UAS program continues to mature and evolve. In 2019 prior to the  
2 start of DIAR, and to ensure external drone pilots had the requisite skills and certifications  
3 required, we developed and implemented a training and pilot vetting program. We also obtained  
4 required Federal Aviation Administration (FAA) authorizations and operational waivers to  
5 perform flights in controlled airspace and/or where operations would occur over people or  
6 moving vehicles. Drone operations also required continuous FAA coordination so that drone  
7 flights did not interfere with other airspace restrictions.

8 To ensure that pilot teams followed the required federal, state, local and SDG&E's  
9 Aviation Safety Operations Procedures requirements for drone operations, we deployed Field  
10 Safety Observers through an external vendor to perform daily crew checks. Field Safety  
11 Observers were licensed pilots under FAA Section 107 and familiar with SDG&E operations.  
12 During early program development from 2019-2020, the ratio of Field Safety Observers to drone  
13 crew was 1:3. The ratio was initially conservative due to the number of drone crews deployed  
14 (over 60 crews were operating across SDG&E's service territory in a diverse geographic area),  
15 limited communication in remote areas with difficult access and uncertainty regarding customer-  
16 interaction, and the pilots' limited experience working around distribution electric facilities.  
17 Prior drone programs at other utilities were limited to transmission inspections and  
18 benchmarking discussions with other utilities highlighted safety issues such as, drone caused line  
19 strikes and crashes. SDG&E was one of the first utilities to perform drone inspections around  
20 distribution electric equipment and there were few drone pilots available with the expertise to  
21 address the particular challenges associated with distribution infrastructure locations, which have  
22 a greater number of attachments than transmission, are typically closer to residential properties  
23 and are in areas with more vegetation density.

1 Starting in 2021-2022, the ratio of field support for drone inspections was reduced to 1:5  
2 due to the maturity of the program, increased pilot experience and pairing of the drone pilot with  
3 a Qualified Electrical Worker (QEW) during field inspections. This change was a deliberate  
4 program design modification to drive cost reductions with no loss of safety and compliance  
5 benefits.

6 In addition, there were numerous requirements in place from 2019-2023 for drone  
7 inspections performed within federal, Tribal, state, or local agency jurisdictions. This  
8 coordination was mandatory, jurisdiction-specific, and often resource-intensive, directly  
9 affecting scheduling, labor needs, and program cost. Below is a summary of some of the  
10 requirements related to the various landowners within SDG&E's service territory.

- 11 • Department of Defense: Drone operations required the highest level of  
12 coordination and approval, including submission of a formal unmanned aircraft  
13 use application through local base commanders, regional base commanders, and  
14 the Department of the Navy in Washington, D.C.. Approval by the Navy Board  
15 was also required prior to flight authorization and daily coordination with base  
16 operations, range operations to clear restricted airspace and there was a mandatory  
17 military approved escort required to accompany drone crews during inspections.  
18 Finally, photos required review by the local base commander before they could be  
19 uploaded for inspection.
- 20 • Tribal Lands: Tribal lands require sovereign-to-sovereign respect and direct  
21 coordination with each Tribe, including advance notification (typically 10–17  
22 days depending on Tribe) and submission of maps identifying SDG&E facilities,  
23 inspection schedules, public outreach materials for distribution to Tribal  
24 members, positive confirmation of approval before entering the Reservation, daily  
25 check-in with Tribal offices or Tribal Law Enforcement, mandatory Tribal  
26 monitors or escorts accompanying inspection crews and coordination of other  
27 SDG&E activities (inspection, vegetation, construction) to minimize repeat  
28 access.

- 1 • California State Parks: Drone inspections within California State Parks and  
2 state-managed lands required agency-specific permissions and operational  
3 controls. Coordination steps included: Obtaining a Drone Use Permit where  
4 required, providing facility location maps, flight schedules, Naming County or  
5 State Parks as additional insured, providing 72-hour advance notice to park  
6 rangers and coordinating on-site presence or agency monitors, when requested.
- 7 • California Department of Fish and Wildlife (CDFW) and U.S. Fish and Wildlife  
8 Service (USFWS): Drone inspections on land owned by these agencies required  
9 formal notification, facility mapping, demonstration flights, compliance with  
10 environmental and wildlife constraints, and agency-approved monitors when  
11 necessary.
- 12 • Federal Land Agencies (USFS and BLM): BLM granted access within SDG&E  
13 rights-of-way with no notification required, once standing permission was in  
14 place. U.S. Forest Service / Cleveland National Forest (USFS/CNF) require  
15 annual notification of flights, ongoing coordination through standing meetings,  
16 and compliance with eagle buffer zones and other environmental restrictions.
- 17 • Local jurisdictions: County Parks required drone use permits, proof of insurance  
18 listing the county as additionally insured, facility maps and inspection schedules,  
19 and 72-hour notice to park rangers. City Parks required 24-hour advance notice  
20 prior to inspections.

21 Finally, because drone inspections were new to the public and drone pilots experienced  
22 negative customer interactions early in the program that posed significant safety concerns to  
23 employees and the public, such as shooting down drones, SDG&E implemented multiple layers  
24 of proactive public engagement, security resources and customer notification. Security personnel  
25 were deployed in specific regions to quickly respond to customer escalations and safety events as  
26 well as accompany crews to known locations with security concerns. Postcard mailers were sent  
27 in advance of flights to customers in areas scheduled for inspections that explained the program,  
28 described what customers could expect during drone flights, provided links for additional

1 information and included a Public Affairs Hotline phone number for questions or concerns.  
2 SDG&E also used its internal customer notification systems to issue pre-recorded voice calls to  
3 all customers potentially impacted by scheduled drone flights. Notifications were typically issued  
4 within the week prior to the scheduled flight. Customers identified as sensitive based on  
5 SDG&E's knowledge (e.g., livestock owners, privacy concerns, prior complaints) received direct  
6 outreach through phone calls, emails and text messages.

7 Customer and community outreach regarding upcoming inspections was typically  
8 performed no more than one week and no less than 24 hours prior to the scheduled drone flight.  
9 Inspection teams also conducted in-person outreach through door-hangers or outreach materials  
10 left at residences. Fact sheets were made available in multiple languages and were also made  
11 available online at <https://www.sdge.com/diar-fact-sheet>. A dedicated Public Affairs Hotline was  
12 also maintained throughout the program with available video references online.<sup>5</sup> Additionally,  
13 notifications were not limited to the inspection phase. Additional outreach (postcards and direct  
14 contact) continued during design, construction and repair activities resulting from drone  
15 inspection findings.

16 **Q. Please provide an overall breakdown of the repair costs associated with each of**  
17 **SDG&E's AM&I programs from 2019-2023.**

18 A. Below is a breakdown of repair costs associated with SDG&E's AM&I programs,  
19 excluding repairs following and resulting from DIAR or RIDI drone inspections. This includes  
20 repair costs resulting from inspection findings from Detailed Inspections of Distribution  
21 Equipment, Detailed Inspections of Transmission Equipment requiring repairs of distribution

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<sup>5</sup> Informational videos are made available to the public at <https://youtu.be/fzmI6iXIIIE4> and [https://youtu.be/\\_ep5oaRAO-o](https://youtu.be/_ep5oaRAO-o) and <https://youtu.be/9EQjUj68Vs8>.

1 underbuild, HFTD Tier 3 Inspections, Infrared Inspections of Distribution Infrastructure,  
 2 Intrusive Pole Inspections, and Patrol Inspections of Distribution Equipment. Repairs resulting  
 3 from drone inspections were tracked separately and are discussed further in my testimony below.

4 **Table JK- 4: AM&I Program Repair Costs (excluding DIAR and RIDI) (\$000s)**

<b>Description</b>	<b>2019</b>		<b>2020</b>	<b>2021</b>	<b>2022</b>	<b>2023</b>	<b>Total</b>
<b>Capital Repairs Direct (\$000)</b>	12,727		12,431	16,835	15,621	10,837	<b>68,452</b>
Capital # of Repairs	755		681	730	631	470	<b>3,267</b>
Capital Cost/Unit (\$,0)	\$16,857		\$18,254	\$23,061	\$24,757	\$23,058	<b>\$20,953</b>
<b>O&amp;M Repairs Direct (\$000)</b>	-		22	744	381	454	<b>1,601</b>
O&M # of Repairs	-		5	97	127	82	<b>311</b>
Capital Cost/Unit (\$,0)	-		\$4,473	\$7,666	\$3,003	\$5,535	<b>\$5,148</b>

5 Additional detail regarding the costs presented in the above table is provided in  
 6 supporting workpapers found in SDG&E-T3-WMPMA-07-E.

7 **III. SPECIFIC ASSET MANAGEMENT AND INSPECTION PROGRAM DETAILS**

8 **1. DISTRIBUTION OVERHEAD DETAILED INSPECTIONS**

9 **Q. Please describe the scope of this inspection program.**

10 A. Distribution overhead detailed inspections are mandated by GO 165 and are intended to  
 11 identify equipment conditions and infractions on overhead distribution structures that do not  
 12 meet GO 95 requirements or internal standards and specifications.

13 Inspections are typically performed from the ground, and include a thorough visual  
 14 assessment of the pole, attachments, conductor, and cables. Where appropriate, individual pieces  
 15 of equipment may be opened, tested, or operated to assess their condition. If warranted, the use  
 16 of infrared or other tools (e.g., binoculars, measurement devices, or drones) may also be utilized

1 to facilitate access if a pole cannot be accessed for inspection. If drones are used to supplement a  
2 distribution overhead detailed inspection, that support was performed on an ad hoc basis and the  
3 inspectors generally do not save the imagery as they would during the DIAR or RIDI processes.

4 Distribution overhead detailed inspections were performed primarily by internal QEWs  
5 that met the training requirements to be qualified inspectors. Certain detailed inspections also  
6 require support services to access and inspect facilities, including but not limited to traffic  
7 control, safety, security, environmental, land rights, Tribal monitors, permitting, and customer  
8 coordination personnel. This support is necessary to safely perform inspections without  
9 compromising public safety, worker safety, or environmental compliance.

10 If an inspection results in a finding, or identification of an issue requiring corrective  
11 action, the inspector documents the condition in SDG&E's inspection program by assigning the  
12 applicable condition code, attaching photographs if required, and recording relevant details  
13 regarding the observed condition. Completion of the inspection with a documented condition  
14 automatically generates a corrective maintenance notification in SDG&E's work management  
15 system, indicating that follow up action is required.

16 If the identified condition poses an immediate safety or wildfire risk, the inspector is  
17 required to notify the on-duty construction supervisor while still in the field. The supervisor will  
18 discuss the condition and determine whether the issue requires emergency repair. For emergency  
19 conditions, crews may be dispatched immediately, and the inspector may be required to remain  
20 on-site until the condition is stabilized or repaired.

21 For non-emergency conditions, the finding is prioritized based on location and  
22 compliance requirements, including applicable General Orders (such as GO 95, GO 128 –  
23 underground equipment - and GO 165) and SDG&E standards. Each condition is assigned a

1 required completion date, and a work order is created to perform the repair. Corrective work may  
2 include repair, reinforcement, replacement, or other mitigation actions, depending on the nature  
3 of the condition and engineering requirements. The scope of work is reviewed and executed by  
4 qualified personnel, and factors such as constructability, access, environmental requirements,  
5 permitting, and outage coordination are incorporated into work planning.

6 SDG&E maintains inspection records that include the circuit, area, facility or equipment  
7 inspected, the inspector's name, the date of the inspection, and any issues (items requiring  
8 corrective action) identified during each inspection, as well as the compliance due date for the  
9 corrective action.

10 **Q. What is the purpose of this program?**

11 A. By identifying nonconformances, corrective repairs can be made to resolve compliance  
12 conditions and reduce the likelihood of a fire, safety, or reliability event from happening. These  
13 inspections are also required for compliance with CPUC General Orders.

14 **Q. What is the frequency of inspections under this program?**

15 A. Inspections are performed on a 5-year routine schedule, as mandated by GO 165.  
16 Structures are grouped into functional locations to support efficiency of inspections and  
17 compliance deadlines are tracked to ensure inspections are completed as required. Accordingly,  
18 the number of inspections fluctuates from year to year based on the number of overhead  
19 structures due within that inspection interval.

20 **Q. Where do these inspections take place?**

21 A. Distribution Overhead Detailed Inspections are performed on all overhead distribution  
22 electric facilities within SDG&E's service territory, including HFTD and non-HFTD areas.

1 **Q. Are there any WMP targets associated with this program? If so, please provide the**  
2 **targets and actuals for any applicable WMP cycle.**

3 A. The following table provides the WMP targets aligned with the number of planned  
4 Distribution Overhead Detailed Inspections in the HFTD for the respective years in question,  
5 with actuals reflecting inspections performed in the HTFD.

Year	2019	2020	2021	2022	2023
Target Units (Inspections)	N/A	17,500	22,269	18,177	11,100
Actual Units (Inspections)	N/A	17,977	22,354	17,935	11,755

6  
7 Inspections were performed in 2019 under this program, however no specified WMP  
8 target was provided for 2019, given the WMP submission guidelines applicable at the time.

9 **Q. Are these inspections coordinated with other programs?**

10 A. Strict timelines imposed by GO 165 related to the definition of year and inspection  
11 interval have created challenges when trying to combine inspection programs. As SDG&E  
12 continues to refine its inspection processes and incorporate more data to move certain programs  
13 to a risk-based schedule, SDG&E plans to work with the CPUC to determine whether  
14 modifications to GO 165 could allow for a more proactive, risk-informed approach to  
15 inspections.

16 While drone inspections and detailed inspections did overlap on occasion from 2019-  
17 2022, drone inspections were limited to potential fire and safety risks only and thus did not  
18 include identification of all GO 95 and SDG&E nonconformances within the scope of Detailed  
19 Inspections of Distribution Equipment, such as missing/damaged high voltage signs. Therefore,  
20 performing a drone inspection did not satisfy the requirements for a Detailed Inspection during

1 this time period, and no other inspection program satisfied the scoping requirements of a  
2 Detailed Inspection.

3 **Q. Are the repairs associated with these inspections coordinated with other programs?**

4 A. SDG&E tracks electric distribution inspection findings collectively, regardless of the  
5 inspection program that identified the issue, with the exception of drone inspection findings from  
6 2019-2022, which were separately tracked. Resolution and repairs arising from any inspection  
7 findings are tracked through to either cancellation (if the issue can be remediated without repair  
8 or no repair is needed) or completion of a repair. Some issues are cancelled due to overlap with  
9 other programs or through QA/QC reviews to confirm that the issue was properly identified and  
10 requires repair or other corrective action. Repairs are typically assigned to internal engineering,  
11 planning, and construction groups to design and execute. While external engineering, support,  
12 and construction may be utilized, the majority of the work is typically performed by SDG&E  
13 employees.

14 SDG&E also performs QA/QC reviews to confirm that repairs were completed  
15 appropriately and that records accurately reflect the work performed. This process promotes the  
16 systematic processing of inspection findings into corrective actions that support regulatory  
17 compliance, wildfire risk reduction, and the safe and reliable operation of SDG&E's electric  
18 system.

19 **2. DETAILED INSPECTIONS OF TRANSMISSION EQUIPMENT**  
20 **(DISTRIBUTION UNDERBUILD)**

21 **Q. Please describe this inspection program.**

22 A. For purposes of SDG&E's WMPs and cost tracking within the WMPMA, this program is  
23 related only to the repairs made to distribution underbuild on a transmission facility, following  
24 identification of a damage or defect during inspections of overhead transmission infrastructure

1 and requiring repair of the distribution-related underbuild. SDG&E did not include inspection  
2 costs for this program in its original Track 2 request since the transmission structure inspections  
3 are recovered through SDG&E's Federal Energy Regulatory Commission (FERC) approved  
4 rates. In compliance with the requirements of D.26-01-011, SDG&E is providing the costs  
5 associated with the repair or replacement of the distribution equipment on the transmission  
6 structure, which is properly allocated to CPUC costs.

7 **Q. What is the purpose of this program?**

8 A. Overall, the replacement or repair of the distribution level equipment on these  
9 transmission lines improves the health of the facility and reduces the likelihood of an ignition,  
10 fault, or other safety event from occurring.

11 **Q. What is the frequency of inspections under this program?**

12 A. Detailed transmission asset inspections are performed on a 3-year cycle; patrols are  
13 performed on an annual basis.

14 **Q. Where do these inspections take place?**

15 A. Detailed Inspections of Transmission Equipment are performed on all overhead  
16 transmission electric facilities within SDG&E's service territory, including HFTD and non-  
17 HFTD areas.

18 **Q. Are there any WMP targets associated with this program? If so, please provide the  
19 targets and actuals for any applicable WMP cycle.**

20 A. SDG&E does not establish WMP targets related to repairs arising from AM&I programs,  
21 as the number of findings from inspections is variable. Thus, there was not a target specifically  
22 related to the number of repairs to distribution underbuild on transmission structures. For context  
23 regarding SDG&E's transmission inspection program targets, the following table provides the

1 WMP targets and actuals associated with the Transmission Overhead Detailed Inspections  
2 program:

Year	2019	2020	2021	2022	2023
Target Units (Inspections)	N/A	298	1,680	2,087	2,387
Actual Units (Inspections)	N/A	286	1,957	2,323	1,928

3  
4 Inspections were performed in 2019 under this program, however no specified WMP  
5 target was provided for 2019, given the WMP submission guidelines applicable at the time.

6 **Q. Are these inspections coordinated with other programs?**

7 A. Because detailed transmission inspections occur on a 3-year cycle versus the 5-year cycle  
8 for electric distribution assets and are performed by different personnel, transmission inspections  
9 were not coordinated with distribution inspections during this period. SDG&E notes, however,  
10 that inspection costs are not included in the Track 2 or Track 3 requests.

11 **Q. Are the repairs associated with these inspections coordinated with other programs?**

12 A. Yes. While transmission repairs resulting from transmission inspections are generally  
13 tracked separately from distribution repairs, SDG&E's transmission and distributional  
14 operational teams review overlaps to reduce redundancy and aim to perform repair work on the  
15 same facility and coordinate where feasible and appropriate.

16 **3. INFRARED INSPECTIONS OF DISTRIBUTION INFRASTRUCTURE**

17 **Q. Please describe this inspection program.**

18 A. Infrared Inspections use thermal imaging technology to identify abnormal heat signatures  
19 on electrical equipment that may indicate deterioration, overloading, loose connections, or  
20 impending failure. These inspections provide condition-based insights that are not visible  
21 through standard visual inspections.

1 Infrared inspections are conducted by qualified thermographers using handheld devices,  
2 vehicle mounted systems, or aerial platforms, depending on location and accessibility. Identified  
3 anomalies are documented in SDG&E's work management system, indicating that follow up  
4 action is required.

5 If the identified condition poses an immediate safety or wildfire risk, the inspector is  
6 required to notify the on-duty construction supervisor while still in the field. The supervisor will  
7 discuss the condition and determine whether the issue requires emergency repair. For emergency  
8 conditions, crews may be dispatched immediately, and the inspector may be required to remain  
9 on-site until the condition is stabilized or repaired.

10 For non-emergency conditions, the finding is prioritized based on location and GO 95  
11 and SDG&E CMP requirements. Each condition is assigned a required completion date, and a  
12 work order is created to perform the repair. Corrective work may include repair, reinforcement,  
13 replacement, or other mitigation actions, depending on the nature of the condition and  
14 engineering requirements. The scope of work is reviewed and executed by qualified personnel,  
15 and factors such as constructability, access, environmental requirements, permitting, and outage  
16 coordination are incorporated into work planning.

17 Inspection records are maintained that include the circuit, area, facility or equipment  
18 inspected, the inspector's name, the date of the inspection, and any issues (items requiring  
19 corrective action) identified during each inspection, as well as the compliance due date for the  
20 corrective action.

21 **Q. What is the purpose of this program?**

22 A. The purpose of Infrared Inspections of Distribution Infrastructure was to proactively  
23 identify conditions that could lead to equipment failure, ignition risk, or service interruptions,

1 enabling corrective action before a risk event occurs. Infrared devices are used in support of  
2 investigating undetermined faults and troubleshooting issues identified through sensors and  
3 Supervisory Control and Data Acquisition (SCADA). This program was intended to survey  
4 higher risk distribution circuits in the HFTD and WUI for thermal anomalies that could result in  
5 equipment failure and subsequent ignition.

6 **Q. What is the frequency of inspections under this program?**

7 A. Infrared inspections were developed as a component of SDG&E's WMP and performed  
8 on a targeted, risk informed basis. These inspections were scheduled independently and in  
9 conjunction with other inspection activities. Specifically, the thermographers that performed  
10 infrared inspections on distribution equipment from 2020-2023 also performed transmission  
11 infrared inspections and patrols of transmission facilities.

12 In 2023, SDG&E applied an added risk-informed overlay using analytics to identify  
13 higher risk structures and circuit segments for inspection. This approach did not reduce planned  
14 inspections, but rather modified inspection location scheduling and approach with the intention  
15 of further identifying whether data analytics could better leverage infrared technology and  
16 improve the identification of structures where thermal anomalies may be more prevalent.

17 The find rate from 2020-2023 remained relatively low, at approximately 0.2% with 0  
18 findings in 2023. In December 2023, SDG&E submitted a change order to Energy Safety to  
19 reduce the program's target to 350 poles located in the WUI with higher forecasted peak loads in  
20 summer months.<sup>6</sup> Office of Energy Infrastructure Safety (OEIS) rejected SDG&E's change

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21  
<sup>6</sup> OEIS Docket No. 2023-2025 WMPs, San Diego Gas & Electric 2023 Change Order Report (Dec. 19, 2023) available at [https://www.sdge.com/sites/default/files/regulatory/2023-12-19\\_SDGE\\_2023\\_Change%20Order%20Report\\_R1.pdf](https://www.sdge.com/sites/default/files/regulatory/2023-12-19_SDGE_2023_Change%20Order%20Report_R1.pdf).

1 request based on a conclusion that reducing the number of inspections did not reduce risk.<sup>7</sup>

2 Thus, SDG&E was required to continue this program at originally stated targets or face a finding  
3 of non-compliance with its WMP.

4 **Q. Where do these inspections take place?**

5 A. These inspections were performed on select overhead distribution equipment throughout  
6 the HFTD and higher risk WUI areas.

7 **Q. Are there any WMP targets associated with this program? If so, please provide the  
8 targets and actuals for any applicable WMP cycle.**

9 A. The following table provides the WMP targets and actuals associated with the program:

Year	2019	2020	2021	2022	2023
Target Units (Inspections)	N/A	8,500	18,000	12,000	9,578
Actual Units (Inspections)	N/A	13,077	17,068	12,264	11,900

10  
11 Inspections were performed in 2019 under this program, however no specified WMP  
12 target was provided for 2019, given the WMP submission guidelines applicable at the time.

13 **Q. Are these inspections coordinated with other programs?**

14 A. From 2020-2022, SDG&E targeted facilities for infrared inspections that were not  
15 otherwise scheduled for Detailed Inspections to reduce redundancy. However, when improved  
16 analytics were employed in 2023, SDG&E experienced some overlap with other inspections.  
17 Because infrared inspections recognize heat signatures and were intended to identify issues that

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<sup>7</sup> Letter from Suzie Rose, Program Manager, Electrical Safety Policy Division, OEIS to Dan Skopec, SVP & Chief Regulatory Officer, SDG&E (May 31, 2024) San Diego Gas & Electric Company's Change Order Request in relations to its 2023-2025 Base Wildfire Mitigation Plan, available at <https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=56751&shareable=true>.

1 could not otherwise be observed visually, they were not coordinated other inspection programs  
2 that target other issues. Further, we did investigate the potential to perform infrared inspections  
3 and drone inspections concurrently, but the drone could not support the load of the high-  
4 resolution camera to take images of the poles and the thermal camera at the same time.

5 **Q. Are the repairs associated with these inspections coordinated with other programs?**

6 A. As with other AM&I programs, resolution of the findings was tracked through  
7 cancellation or completion. Some issues are cancelled due to overlap with other programs or  
8 through QA/QC reviews to confirm that the issue was properly identified and requires repair or  
9 other corrective action. Repairs are typically assigned to internal engineering, planning, and  
10 construction groups to design and execute. While external engineering, support and construction  
11 may be utilized, the majority of the work is typically performed by internal resources.

12 If a repair cannot be completed within the required timeframe, a formal deferral process  
13 is required, including documentation of the reason for delay and assignment of a revised  
14 completion date.

15 SDG&E also performs QA/QC reviews to confirm that repairs were completed  
16 appropriately and that records accurately reflect the work performed. This process supports the  
17 systematic processing of inspection findings into corrective actions that support regulatory  
18 compliance, wildfire risk reduction, and the safe and reliable operation of SDG&E's electric  
19 system.

#### 20 **4. INTRUSIVE POLE INSPECTIONS**

21 **Q. Please describe this inspection program.**

22 A. Wood pole intrusive inspections are mandated by GO 165 and are a component of  
23 SDG&E's CMP and WMP. These inspections involve physical testing of utility poles by drilling

1 into the pole and removing soil from around the base of the pole below the ground surface to  
2 assess internal condition, groundline condition, structural integrity, and remaining service life.  
3 The inspections also involve the application of chemical treatment to the interior of the pole.  
4 Many wood poles—especially Western species like Douglas-fir and Western red cedar—have  
5 large untreated heartwood zones. These interior zones are highly susceptible to fungal decay,  
6 even when the exterior of the pole looks sound. Fumigants applied inside drilled holes treat parts  
7 of the pole that surface treatments cannot reach. Further, the portion of the pole exposed during  
8 subsurface excavation is treated with a preservative paste that arrests fungal decay and a wrap  
9 that keeps the preservative in place and acts as a moisture barrier.

10         These inspections and treatments go beyond visual assessments and are designed to  
11 identify internal decay, deterioration, or defects that are not externally visible and extend the  
12 structural service life of poles that remain otherwise sound.

13         Intrusive inspections are performed by external contractors trained and certified in these  
14 testing and chemical treatment methods. Results are documented in SDG&E’s work management  
15 system, and poles that do not meet required standards are scheduled for corrective action, which  
16 generally included reinforcement or replacement. QA/QC audits of the inspections were also  
17 performed at a rate of approximately 10% to ensure inspections are being performed by external  
18 contractors per SDG&E standards.

19         If an identified condition poses an immediate safety or wildfire risk, the inspector is  
20 required to notify the on-duty construction supervisor while still in the field. The supervisor will  
21 review the condition and determine whether the issue requires emergency repair. For emergency  
22 conditions, crews may be dispatched immediately. For non-emergency conditions, repair of the

1 finding is prioritized based on location and GO 95 and SDG&E CMP requirements. The issue is  
2 assigned a required completion date, and a work order is created to perform the repair.

3 SDG&E maintains inspection records that include the circuit, area, facility or equipment  
4 inspected, the inspector's name, the date of the inspection, and any issues (items requiring  
5 corrective action) identified during each inspection, as well as the compliance due date for the  
6 corrective action.

7 **Q. What is the purpose of this program?**

8 A. The purpose of wood pole intrusive inspections is to test and treat wood poles to confirm  
9 the structural soundness of wood poles, reduce the risk of pole failure, support informed  
10 decisions regarding pole repair, reinforcement, or replacement and to extend the service life of  
11 the pole by minimizing fungal decay or damage from other pests, such as termites. Industry  
12 research<sup>8,9,10</sup> collectively demonstrates that testing (inspections) and treating (remedial  
13 preservatives / restoration) of wood poles improves the utility infrastructure, thus reducing  
14 wildfire risk by reducing the chance of pole failure (*e.g.*, pole leaning, breaking or falling) that  
15 could cause a correlated equipment failure, safety event such as an ignition, and/or outage.

16 **Q. What is the frequency of inspections under this program?**

17 A. From 2019-2022, intrusive inspections were performed on a 10-year cycle with the  
18 exception of poles aged 15 years or more that have undergone a non-routine inspection within

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<sup>8</sup> See USDA. 2013. Rural Utilities Service Bulletin 1730B 121 – Wood Pole Inspection & Maintenance. Available at: [https://www.rd.usda.gov/files/UEP\\_Bulletin\\_1730B-121.pdf](https://www.rd.usda.gov/files/UEP_Bulletin_1730B-121.pdf).

<sup>9</sup> Grid Deployment Office, Berkeley Lab. 2024. Utility Pole Maintenance and Upgrades, Resilience Investment Guide. Available at [https://www.energy.gov/sites/default/files/2024-11/111524\\_Utility\\_Pole\\_Maintenance\\_and\\_Upgrades.pdf](https://www.energy.gov/sites/default/files/2024-11/111524_Utility_Pole_Maintenance_and_Upgrades.pdf).

<sup>10</sup> Morrell, J.J. Estimated Service Life of Wood Poles. North American Wood Pole Council Technical Bulletin, No. 16-U-101. Available at [https://woodpoles.org/wp-content/uploads/TB\\_ServiceLife.pdf](https://woodpoles.org/wp-content/uploads/TB_ServiceLife.pdf).

1 the last 5 years, as required by GO 95, Rule 44.2. That rule requires that poles undergoing  
2 reconstruction or modification have an updated pole loading calculation to validate compliance  
3 with required safety factors. One of the inputs necessary to perform the pole loading calculation  
4 is the pole's current remaining strength, which requires an intrusive inspection result that is no  
5 more than 5 years old. Thus, some poles were inspected more frequently than 10 years if an  
6 inspection was needed to perform a pole loading calculation to verify safety factors under GO  
7 95, Rule 44.2. QA/QC audits are performed within 1-2 months after the inspection is completed.

8 **Q. Where do these inspections take place?**

9 A. These inspections are performed on wood poles throughout SDG&E's overhead  
10 distribution system across both HFTD and non HFTD areas. For efficiency, the routine  
11 inspections are grouped by areas of SDG&E's service territory (*i.e.*, districts), which results in  
12 large fluctuations in the number of intrusive inspections performed in the HFTD from year to  
13 year as shown in our WMP targets and inspection results from 2019-2023.

14 **Q. Are there any WMP targets associated with this program? If so, please provide the**  
15 **targets and actual units for any applicable WMP cycle.**

16 A. The following table provides the WMP targets and actuals associated with the program,  
17 which are associated with wood pole intrusive inspections performed in the HFTD:

<b>Year</b>	<b>2019</b>	<b>2020</b>	<b>2021</b>	<b>2022</b>	<b>2023</b>
<b>Target Units (Inspections)</b>	N/A	18,000	9,796	350	50
<b>Actual Units (Inspections)</b>	19,729	14,450	8,721	967	1,038

18  
19 No specified WMP target was provided for 2019, given the WMP submission guidelines  
20 applicable at the time

1 **Q. Are these inspections coordinated with other programs?**

2 A. Intrusive inspections are unique and performed by personnel trained to test and treat the  
3 poles. As the contractors are not qualified to evaluate the health or status of other electrical  
4 equipment, these inspections are not coordinated with other inspection efforts.

5 **Q. Are the repairs associated with these inspections coordinated with other programs?**

6 A. As previously addressed, with the exception of repairs associated with the DIAR and  
7 RIDI programs, all electric distribution inspection findings are tracked together, regardless of the  
8 inspection program that identified the issue. Resolution of findings are tracked through  
9 cancellation or completion. Some issues are cancelled due to overlap with other programs or  
10 through QA/QC reviews to confirm that the issue was properly identified and requires repair or  
11 other corrective action.

12 Repairs resulting from wood pole intrusive inspections generally result in the installation  
13 of a steel reinforcement or replacement of the pole. If reinforcement was recommended and  
14 approved by the SDG&E construction supervisor, then the contractor that performed the  
15 inspection is issued an order to install the reinforcement as per SDG&E standards. If a pole  
16 replacement is the recommended corrective action, then the repair is typically assigned to  
17 internal engineering, planning, and construction groups to design and execute.

18 If a repair cannot be completed within the required timeframe, a formal deferral process  
19 is required, including documentation of the reason for delay and assignment of a revised  
20 completion date. SDG&E also performs QA/QC reviews to confirm that repairs were completed  
21 appropriately and that records accurately reflect the work performed. This process promotes the  
22 systematic processing of inspection findings into corrective actions that support regulatory

1 compliance, wildfire risk reduction, and the safe and reliable operation of SDG&E's electric  
2 system.

### 3 **5. HFTD TIER 3 INSPECTIONS**

4 **Q. Please describe this inspection program.**

5 A. HFTD Tier 3 distribution pole inspections were initially required by a settlement  
6 agreement adopted by the CPUC in Decision D.10-04-047. These inspections were performed by  
7 inspecting a third of the assets in the identified area each year over a three-year cycle. Pursuant  
8 to that settlement, SDG&E incorporated these inspections into our CMP and conducted HFTD  
9 Tier 3 inspections to meet the settlement obligation that started in 2010 and ended in 2016. After  
10 2016, SDG&E elected to proactively continue HFTD Tier 3 inspections as part of its broader  
11 inspection efforts to reduce wildfire ignition risk. HFTD Tier 3 inspections were performed by  
12 internal QEWs that received specialized CMP training and the inspection was focused on only  
13 potential conditions that could result in an ignition or safety risk. The inspection included a  
14 visual assessment of infrastructure and use of specialized tools where appropriate.

15 Based on available information obtained during the implementation of the DIAR program  
16 from 2019-2022, including the proven effectiveness of drone inspections as further discussed  
17 below, SDG&E elected to discontinue the Tier 3 inspections in 2023. In 2023, SDG&E  
18 incorporated the HFTD Tier 3 Inspection program in conjunction with development of SDG&E's  
19 risk informed drone inspection program, RIDI. Thus, this program had no WMP targets in 2023  
20 and SDG&E is not requesting inspection costs associated with the program in Track 3.

21 Results of the inspections were documented in SDG&E's work management system, and  
22 poles that did not meet required standards were scheduled for corrective action. If the identified  
23 condition poses an immediate safety or wildfire risk, the inspector is required to notify the

1 on-duty construction supervisor while still in the field. The supervisor will review the condition  
2 and determine whether the issue requires emergency repair. For emergency conditions, crews  
3 may be dispatched immediately, and the inspector may be required to remain on-site until the  
4 condition is stabilized or repaired.

5 For non-emergency conditions, the finding is prioritized based on location and GO 95  
6 and SDG&E CMP requirements. The issue is assigned a required completion date, and a work  
7 order is created to perform the repair. Inspection records were maintained that include the circuit,  
8 area, facility or equipment inspected, the inspector's name, the date of the inspection, and any  
9 issues (items requiring corrective action) identified during each inspection, as well as the  
10 compliance due date for the corrective action.

11 **Q. What is the purpose of this program?**

12 A. By continuing to perform these inspections beyond the settlement agreement timeframe,  
13 SDG&E maintained another inspection layer in the HFTD Tier 3 with the purpose of identifying  
14 and remediating hazardous conditions sooner (three-year cycle as compared to a five-year CMP  
15 cycle) and reducing the likelihood that undetected defects could lead to wildfire ignition. The  
16 program also supported SDG&E's WMP and compliance with approved WMP targets.

17 In addition, the performance of these inspections was a compliance requirement of  
18 SDG&E's CMP, which is mandated by GO 165. So, while this inspection type is not specifically  
19 required by GO 165, it was incorporated into SDG&E's compliance obligations prior to 2023.

20 Based on available information obtained during the implementation of the DIAR program  
21 from 2019-2022, including the proven effectiveness of drone inspections as further discussed  
22 below, SDG&E elected to discontinue the Tier 3 inspections in 2023 to streamline efficiencies  
23 and avoid any potential program redundancy.

1 **Q. What is the frequency of inspections under this program?**

2 A. HFTD Tier 3 inspections were designed to only identify potential fire and safety hazards  
3 and were performed every three years on all overhead electric facilities within the Tier 3 HFTD.  
4 The goal was to complete all scheduled HFTD Tier 3 inspections by June 1 annually, facilitating  
5 completion of any higher risk repairs prior to the region’s peak fire and PSPS season in the fall  
6 and winter.

7 **Q. Where do these inspections take place?**

8 A. HFTD Tier 3 inspections were limited to overhead distribution facilities located within  
9 designated High Fire Threat Districts.

10 **Q. Are there any WMP targets associated with this program? If so, please provide the**  
11 **targets and actuals for any applicable WMP cycle.**

12 A. The following table provides the WMP targets and actuals associated with the program:

<b>Year</b>	<b>2019</b>	<b>2020</b>	<b>2021</b>	<b>2022</b>	<b>2023</b>
<b>Target Units (Inspections)</b>	N/A	11,500	10,815	12,268	0
<b>Actual Units (Inspections)</b>	15,176	11,864	11,535	12,263	0

13  
14 No specified WMP target was provided for 2019, given the WMP submission guidelines  
15 applicable at the time

16 **Q. Are these inspections coordinated with other programs?**

17 A. HFTD Tier 3 inspections were satisfied by the five-year Detailed Inspections of  
18 Distribution Equipment if the HFTD Tier 3 inspection was due in the same calendar year as the  
19 Detailed Inspection. This reduced redundancy of inspections between the HFTD Tier 3 and  
20 Detailed Inspection programs.

21 **Q. Are the repairs associated with these inspections coordinated with other programs?**

1 A. As previously described, with the exception of drone inspection findings from 2019-  
2 2022, all electric distribution inspection findings are tracked together, regardless of the  
3 inspection program that identified the issue. And resolution of the findings are tracked through  
4 cancellation or completion. Some issues are cancelled due to overlap with other programs or  
5 through QA/QC reviews to confirm that the issue was properly identified and requires repair or  
6 other corrective action. Repairs are typically assigned to internal engineering, planning, and  
7 construction groups to design and execute. While external engineering, support and construction  
8 may be utilized, the majority of the work is typically performed in house.

9 If a repair cannot be completed within the required timeframe, a formal deferral process  
10 is required, including documentation of the reason for delay and assignment of a revised  
11 completion date. SDG&E also performs QA/QC reviews to confirm that repairs were completed  
12 appropriately and that records accurately reflect the work performed. This process promotes the  
13 systematic processing of inspection findings into corrective actions that support regulatory  
14 compliance, wildfire risk reduction, and the safe and reliable operation of SDG&E's electric  
15 system.

16 **Q. Is SDG&E requesting any costs associated with this program in Track 3?**

17 A. SDG&E is not requesting costs associated with HFTD Tier 3 inspections in Track 3.  
18 SDG&E's Track 3 request is limited to repairs performed in 2023 that followed HFTD Tier 3  
19 inspections in prior years. Repairs under this program were coordinated with repairs related to  
20 other AM&I programs, excepting drone inspection repairs.

21 **6. PATROL INSPECTIONS OF DISTRIBUTION EQUIPMENT**

22 **Q. Please describe this inspection program.**

1 A. Overhead patrols are a compliance-driven inspection mandated by GO 165, GO 95 and  
2 SDG&E's CMP. GO 165 defines a patrol as a visual inspection intended to identify obvious  
3 hazards and requires utilities to patrol overhead distribution facilities on prescribed intervals. GO  
4 165 was revised in December 2017 to require patrol inspections in rural areas to be performed  
5 once per year in Tier 2 and Tier 3 of the HFTD. Accordingly, starting in 2018, SDG&E  
6 performed patrols annually across its service territory, exceeding the minimum GO 165  
7 requirements in some areas, to ensure consistent compliance and documentation. Patrol  
8 inspections were performed primary by internal QEWs from the ground or by vehicle and focus  
9 on obvious issues, such as damaged poles, leaning structures, broken crossarms, conductor  
10 clearance issues, or other visible abnormalities.

11 If an inspection results in a finding, or identification of an issue requiring corrective  
12 action, the inspector documents the condition in SDG&E's inspection program by assigning the  
13 applicable condition code, attaching photographs where required, and recording relevant details  
14 regarding the observed condition. Completion of the inspection with a documented condition  
15 automatically generates a corrective maintenance notification in SDG&E's work management  
16 system, indicating that follow up action is required. If the identified condition poses an  
17 immediate safety or wildfire risk, the inspector is required to notify the on-duty construction  
18 supervisor while still in the field. The supervisor will discuss the condition and determine  
19 whether the issue requires emergency repair. For emergency conditions, crews may be  
20 dispatched immediately, and the inspector may be required to remain on-site until the condition  
21 is stabilized or repaired.

22 For non-emergency conditions, the finding is prioritized based on location and  
23 compliance requirements, including applicable General Orders (such as GO 95, GO 128 –

1 underground equipment - and GO 165), and SDG&E standards. Each condition is assigned a  
2 required completion date, and a work order is created to perform the repair. Corrective work may  
3 include repair, reinforcement, replacement, or other mitigation actions, depending on the nature  
4 of the condition and engineering requirements. The scope of work is reviewed and executed by  
5 qualified personnel, and factors such as constructability, access, environmental requirements,  
6 permitting, and outage coordination are incorporated into work planning.

7        Inspection records are maintained that include the circuit, area, facility or equipment  
8 inspected, the inspector's name, the date of the inspection, and any issues (items requiring  
9 corrective action) identified during each inspection, as well as the compliance due date for the  
10 corrective action.

11 **Q.     What is the purpose of this program?**

12 A.     Patrol inspections are compliance driven and required under GO 165 to provide  
13 continuous system awareness between more detailed inspection cycles. These inspections serve  
14 as the first line of defense for identifying obvious structural problems and hazards on overhead  
15 electric facilities that could present safety, wildfire, or reliability risks. Without patrols, emerging  
16 hazards could go undetected until the next scheduled detailed inspection, which can be a period  
17 of three to five years.

18 **Q.     What is the frequency of inspections under this program?**

19 A.     Patrols are required to be performed within 12 consecutive calendar months, starting with  
20 the first full calendar month after the prior patrol, plus an allowable grace period of up to three  
21 additional full calendar months, but not to exceed the end of the calendar year in which the next  
22 patrol is due. This definition ensures compliance with GO 165's inspection interval requirements  
23 while allowing limited scheduling flexibility.

1 **Q. Where do these inspections take place?**

2 A. Patrol inspections are performed on all overhead and underground distribution facilities  
3 throughout SDG&E's service territory, including both HFTD and non-HFTD areas.

4 **Q. Are there any WMP targets associated with this program? If so, please provide the**  
5 **targets and actuals for any applicable WMP cycle.**

6 A. The following table provides the WMP targets and actuals associated with the program:

Year	2019	2020	2021	2022	2023
Target Units (Inspections)	N/A	86,000	86,000	86,490	86,880
Actual Units (Inspections)	N/A	86,075	86,490	86,821	85,847

7  
8 Inspections were performed in 2019 under this program, however, no specified WMP target was  
9 provided for 2019, given the WMP submission guidelines applicable at the time

10 **Q. Are these inspections coordinated with other programs?**

11 A. While overhead patrol requirements may be satisfied by another qualifying inspection—  
12 such as a detailed overhead inspection or a drone inspection—provided the inspection occurs  
13 within the applicable patrol interval, the inspection interval prescribed under GO 165 affords  
14 limited scheduling flexibility. As a result, in 2019-2022, patrols were performed in addition to  
15 other inspection activities. SDG&E does look to implement efficiencies for patrol inspections  
16 where possible. For instance, patrols are typically conducted by Electric Trouble Shooters as part  
17 of their routine field duties and are frequently completed contemporaneously with those  
18 activities, which promotes cost efficiency and a lower cost per inspection.

19 **Q. Are the repairs associated with these inspections coordinated with other programs?**

20 A. As previously discussed, with the exception of repairs from the DIAR and RIDI  
21 programs, all electric distribution inspection findings are tracked together. And resolution of the

1 findings are tracked through cancellation or completion. Some issues are cancelled due to  
2 overlap with other programs or through QA/QC reviews to confirm that the issue was properly  
3 identified and requires repair or other corrective action. Repairs are typically assigned to internal  
4 engineering, planning, and construction groups to design and execute. While external  
5 engineering, support and construction may be utilized, the majority of the work is typically  
6 performed internally.

7 If a repair cannot be completed within the required timeframe, a formal deferral process  
8 is required, including documentation of the reason for delay and assignment of a revised  
9 completion date. SDG&E also performs QA/QC reviews to confirm that repairs were completed  
10 appropriately and that records accurately reflect the work performed. This process promotes  
11 identification of inspection findings and corrective actions that support regulatory compliance,  
12 wildfire risk reduction, and the safe and reliable operation of SDG&E's electric system.

13 **7. DRONE ASSESSMENTS OF DISTRIBUTION INFRASTRUCTURE(DIAR**  
14 **AND RIDI)**

15 **Q. Please describe the scope of SDG&E's WMP Drone Assessment Programs.**

16 A. The DIAR Program involves flight planning, drone flight and image capture, field  
17 observations, image assessment, determination of findings, and repair and remediation. Imagery  
18 collected by drones improves upon traditional ground inspections by providing inspectors with a  
19 "birds eye view" of overhead facilities, as well as high resolution imagery of overhead  
20 equipment and components. The use of drones to collect imagery also enhances an inspector's  
21 ability to identify potential fire hazards related to certain types of issues or where conditions such  
22 as terrain and vegetation density make full detailed inspections difficult. Through its experience  
23 developing and implementing the DIAR program, SDG&E discovered that drone inspections  
24 more readily observed issues including damaged arresters, damaged insulators, issues with pole

1 top work, issues with armor rods, crossarm or pole top damage, exposed connections, loose  
2 hardware, improper splices, and damaged conductors.

3 SDG&E's drone inspection programs are comprised of two phased programs. The first,  
4 DIAR, was in effect from 2019-2022, and consisted of the following activities:

- 5 (1) Collecting imagery using drones of all overhead distribution electric facilities in  
6 the Tier 2 and Tier 3 HFTD and higher risk WUI areas,
- 7 (2) QEWs performing associated inspections of overhead distribution facilities using  
8 imagery and field observations,
- 9 (3) Repairing issues observed during inspections,
- 10 (4) Utilizing the images collected and damages identified by the QEWs to develop  
11 Intelligent Image Processing (IIP) capabilities in the form of ML models that  
12 could perform automated asset identification and damage detection, and
- 13 (5) Operationalizing ML models to perform QA/QC of drone inspections performed.

14 The first phase of DIAR included drone inspections of all distribution infrastructure in  
15 Tier 3 of the HFTD, starting in 2019. Within the first few months of flights, drone inspections  
16 identified 24 emergency issues and the overall infraction find rate was approximately 30% of  
17 poles inspected. Based on the success of these initial results in identifying potential wildfire risk  
18 and safety conditions, SDG&E continued the DIAR program in Tier 3 through 2020. Ultimately  
19 the DIAR program expanded to include drone inspections of all overhead infrastructure in Tier 2  
20 of the HFTD and higher risk WUI areas in subsequent years.

21 Corresponding with the development of the DIAR program, SDG&E's digital innovation  
22 team explored whether advancements in image recognition capabilities could enable Machine  
23 Learning models to identify assets and detect damages on overhead electric facilities. The drone  
24 program presented a unique opportunity with a statistically significant sample size to take  
25 advantage of the collection of millions of images that would be labeled by inspectors in their

1 ordinary scope of work that could then be leveraged to train Machine Learning models and  
2 develop an innovative capability that could benefit customers in the form of reduced inspection  
3 costs for years to come.

4 From 2019-2020, DIAR scope included inspections of approximately 39,000 overhead  
5 electric distribution poles and associated infrastructure in the Tier 3 of the HFTD. Each  
6 inspection included image collection by drone pilots paired with a visual observer, identification  
7 of potential fire/safety hazards by QEWs, and repair of issues identified through the inspection.  
8 To promote cost efficiencies, approximately 2,000 poles were removed from the scope of DIAR  
9 inspections because they had recently been replaced through other programs. The images  
10 collected by the drone pilots were reviewed by QEWs via desktop to identify potential fire and  
11 safety hazards, which then initiated work orders to remediate the identified hazards. All work  
12 necessary to manage, engineer, and construct the repairs identified was included in the scope of  
13 the program.

14 In 2021-2022, SDG&E modified the inspection methodology to enable QEWs to work as  
15 a team in the field with the drone pilots to perform image collection and identification of  
16 potential fire/safety hazards for approximately 50,000 overhead electric distribution poles in the  
17 Tier 2 of the HFTD and the higher risk WUI areas. With QEWs in the field with the drone pilots,  
18 DIAR inspections included both traditional ground observations along with the use of images  
19 taken by the pilot to identify potential hazards. This modification allowed QEWs to aid in  
20 identifying emergency conditions sooner and achieve additional efficiencies, since QEWs also  
21 performed minor repairs to poles during their field inspections, including replacing signage and  
22 pole tags, fixing guy guards and removing climbing steps.

1           During this time period of Tier 2 DIAR inspections, poles were also removed from the  
2 scope of inspections due to age (*i.e.*, pole less than 1 year old) or overlap with projects  
3 anticipated to replace the pole within the next 12 months. With QEWs in the field with the drone  
4 pilots, DIAR inspections included both traditional ground observations along with the use of  
5 images taken by the pilot to identify potential hazards. The work necessary to manage, engineer  
6 and construct the repair of issues identified in both Tier 2, Tier 3 and WUI was ongoing during  
7 this timeframe and included in the scope and costs of the Program.

8           Starting in 2023, SDG&E's drone program consisted of ongoing repair work of potential  
9 fire hazards identified through the DIAR inspections occurring from 2019-2022 and  
10 implementation of a newly created Risk-Informed Drone Inspection Program. RIDI involved the  
11 following:

- 12           (1)    The development and implementation of a risk informed inspection prioritization  
13                model, which is described in more detail later, to identify the highest risk poles in  
14                the HFTD and WUI for inspection on an annual basis;
- 15           (2)    Collecting imagery of overhead distribution electric facilities using drones in the  
16                Tier 2, Tier 3 HFTD and WUI areas using a risk informed inspection  
17                prioritization model;
- 18           (3)    Having QEWs paired with drone pilots to perform inspections of overhead  
19                distribution facilities using both imagery and field observations;
- 20           (4)    Repairing issues observed during inspections;
- 21           (5)    Utilizing the images collected and damages identified by the QEWs to enhance  
22                our Intelligent Image Processing (IIP) capabilities in the form of machine learning  
23                models that perform automated asset identification and damage detection; and
- 24           (6)    Operationalizing those damage detection models to perform QA/QC of drone  
25                inspections performed.

1 To further promote efficiencies, QEWs also performed minor repairs to poles during their  
2 field inspections, including replacing signage and pole tags, fixing guy guards and removing  
3 climbing steps.

4 **Q. What is the purpose of this program?**

5 A. Compared to traditional inspection programs, the use of drone technology offered the  
6 potential to obtain high-resolution, close-range, and top-down imagery and identify non-obvious  
7 issues that traditional ground or patrol inspections performed by inspectors observing from the  
8 ground cannot consistently achieve. This is especially relevant for certain types of overhead  
9 electric components such as insulators and arresters, crossarm and pole-top damage, exposed or  
10 loose connections, improper splices and armor rod issues, and damaged conductors and  
11 hardware. Additionally, drone inspections allowed safer inspection of infrastructure in locations  
12 where traditional inspections are constrained by steep or rugged terrain, dense vegetation and  
13 remote or limited-access.

14 Further, as previously addressed, use of drone image collection has also allowed for IIP  
15 capabilities and Machine Learning to identify and detect damaged equipment in a more  
16 streamlined manner than traditional inspection methods.

17 SDG&E has continuously monitored this program to assess comparisons between drone  
18 and other inspection methods. Upon these reviews, it became obvious that drone inspections  
19 enabled the identification of more fire hazards than traditional inspections, as further discussed  
20 later.

21 The DIAR inspections and associated repairs performed from 2019-2022 established a  
22 comprehensive baseline of the status of SDG&E's system within the HFTD, as well as a  
23 structure for facilitating and performing repairs of any assets within required timeframes.

1 SDG&E’s DIAR program was unique across any similar effort in that it assessed the health of all  
2 assets in the HFTD over a four-year period and quickly addressed wildfire risk conditions.  
3 Further, as discussed elsewhere, this baseline of knowledge informed SDG&E’s situational  
4 awareness capabilities, allowing for more targeted and informed system operating decisions,  
5 including during PSPS events. No other California utility has undertaken a similar effort;  
6 distribution drone inspections performed by Pacific Gas & Electric Company (PG&E) and  
7 Southern California Edison Company (SCE) are newer and more limited in scope.

8         After SDG&E completed its HFTD-wide inspections as part of DIAR, it was reasonable  
9 to reduce the annual scope of the program and transition to performing fewer inspections on a  
10 risk-based selection of poles under RIDI. Continuing its drone program in a risk informed  
11 manner allowed SDG&E to continue effective wildfire risk reduction but with fewer inspections  
12 on an ongoing basis. SDG&E’s risk-informed models show that a subset of poles drive a large  
13 share of ignition risk based on characteristics such as asset age, historic inspection results,  
14 location (*e.g.*, elevation) and environmental factors (*e.g.*, terrain, vegetation). By prioritizing  
15 inspections based on probability and consequence of failure—rather than inspecting every asset  
16 on a fixed cycle—SDG&E targeted the assets most likely to have a condition that could cause an  
17 ignition, achieving higher hazard find rates, detecting emergency conditions earlier, and avoiding  
18 unnecessary inspections of low-risk infrastructure.

19         Thus, the purpose of RIDI was to reduce wildfire risk by concentrating enhanced  
20 inspection efforts that look for non-obvious hazards where catastrophic ignition risk is highest.  
21 This risk-informed approach, however, would not have been as feasible to accurately implement  
22 absent the volume of data and baseline of knowledge developed under the DIAR program.

23 **Q. Why was the program necessary?**

1 A. SDG&E’s drone inspection programs are necessary to reduce wildfire and safety risk by  
2 identifying conditions on electric infrastructure that cannot be reliably detected through  
3 traditional ground patrols or other inspection methods. Drone inspections provide close-range,  
4 high-resolution imagery of pole tops, crossarms, and equipment in high-fire-threat and  
5 hard-to-access areas, allowing SDG&E to detect and remediate less obvious issues that may not  
6 even be visible through climbing, lift trucks, or helicopters, each of which also present greater  
7 safety, environmental, and operational constraints, in addition to being a more disruptive  
8 inspection method for customers on inspected properties. The program improves worker and  
9 public safety, enables inspections in rugged and remote terrain, supports faster emergency  
10 response and outage assessment, and enhances SDG&E’s ability to prioritize repairs using a  
11 risk-informed approach. Drone inspections are designed to complement existing inspection  
12 programs and are a critical component of SDG&E’s wildfire mitigation and asset management  
13 strategy.<sup>11</sup>

14 Upon implementation of the program in 2019, the effectiveness of drone inspections in  
15 identifying potential hazards and ignition sources versus traditional inspection programs became  
16 immediately apparent. The success of the DIAR and RIDI programs in identifying potential fire  
17 and safety hazards for remediation are shown in the tables below. These tables provide metrics  
18 on both the number of hazards identified and the severity of the hazards.  
19

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<sup>11</sup> See SDG&E 2023-2025 Base WMP (October 23, 2023) at 44 (citing implementation of a risk informed drone inspection program and use of machine learning and damage detection models as a WMP strength); OEIS’s Final Decision of SDG&E’s Evaluation of 2022 WMP Update (July 2022) at 2 (citing SDG&E’s continued successful use of drones “with a relatively high find rate” in distribution system inspections); *Id.* at 57 (citing implementation of machine learning to aid in damage detection as an improvement in SDG&E’ WMP practices).

**Table JK- 5: 2019-2023 Fire/Safety Hazard Find Rate Comparison**

<b>Year</b>	<b>Poles Inspected (Drones)</b>	<b>Drone Inspection % of Fire/Safety Issues per Poles Inspected (% of poles with 1 or more Fire/Safety Issues)<sup>12</sup></b>	<b>Poles Inspected (CMP)</b>	<b>CMP Detailed Inspection % of Poles with 1 or more Fire/Safety Issues</b>
2019	10,524	35% (11% of Poles Inspected)	16,239	3.1%
2020	26,787	30% (20% of Poles inspected)	17,935	3.3%
2021	23,081	38% (28% of Poles inspected)	23,354	2.5%
2022	25,976	35% (25% of poles inspected)	17,935	2.5%
2023	15,234	49% (28% of poles inspected)	11,755	3.1%

**Table JK- 6: 2019-2023 Severity of Issues Identified by Drone Inspections**

<b>Issue Severity</b>	<b>Tier 3 (2019-2020)</b>	<b>Tier 2 &amp; WUI (2021-2022)</b>	<b>RIDI (2023)</b>	<b>Total</b>
<b>Level 1 - Emergency</b>	113 (1.4%)	226 (1.6%)	26 (0.006%)	365
<b>Level 2 - Moderate</b>	9,056	16,049	7,452	35,114

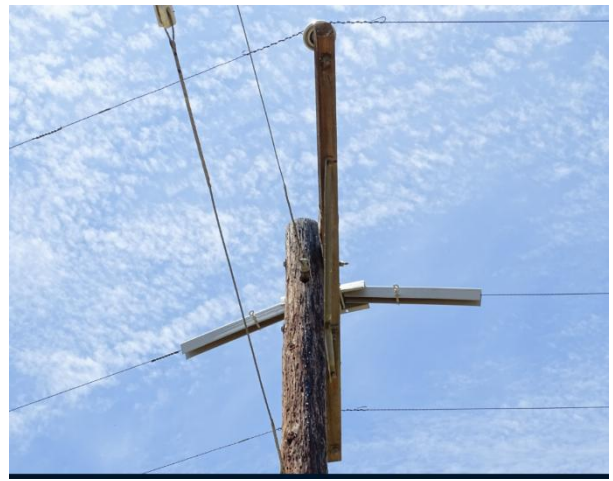
GO 95, Rule 18B defines a Level 1 or emergency issue as a condition that presents an immediate risk of high potential impact to safety or reliability and a Level 2 or moderate issue as any other risk of at least moderate potential impact to safety or reliability. Rule 18B further mandates that potential fire hazards in the Tier 2 and Tier 3 HFTD with moderate severity be remediated within 12 and 6 months, respectively. Therefore, issues identified through these inspection programs had the potential to result in a catastrophic ignition event had they not been identified and repaired in a timely manner, with a calculated average wildfire consequence cost of \$829M per event.

<sup>12</sup> The first number is the overall issue find rate, or number of issues found measured by the number of poles inspected. The second number (in parenthesis) is the number of poles with issues versus poles with no identified issues, illustrating that in many cases drone inspections discovered more than one issue on the pole.

1 Overall, DIAR and RIDI found 18% more poles with emergency or moderate potential  
2 fire hazards than traditional Detailed Inspections and were effective in identifying emergency  
3 damages approximately 29 months earlier.

4 Below are some examples of the types of damages SDG&E was able to identify during  
5 drone inspections performed from 2019-2022 that otherwise would not have been visible through  
6 traditional ground-based inspections.

7



8  
9 Figure JK- 1: P110290, 6/25/2020, Hollow Pole Top and view from below with no visible  
10 damage.

11



1

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3

4

Figure JK- 2: P475444, 12/10/2021, Damaged Crossarm and view from below with no visible damage.



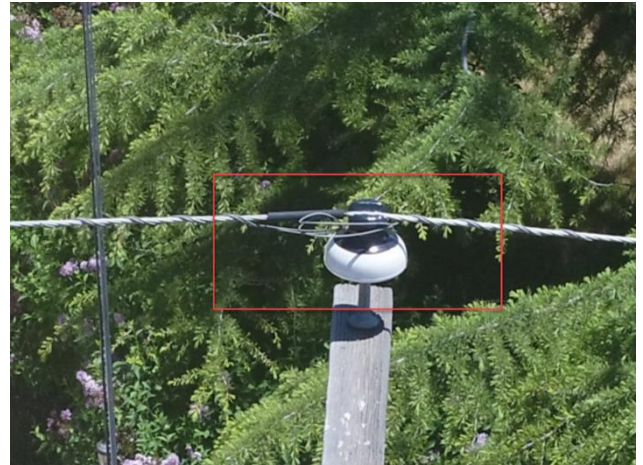
5

6

Figure JK- 3: P283191, 1/3/2022, Bolt coming out and view from below with no visible damage.



1  
2 Figure JK- 5: P572459, 4/9/2020, Transformer  
3 lid missing.



4  
5 Figure JK- 4: P46654, 5/8/2020, Loose tie  
6 wire on insulator.

7 As illustrated by these examples, an elevated perspective of electrical assets significantly  
8 improves the identification of potential fire hazards, such as damaged conductors, crossarms,  
9 arrestors, insulators, or deadends (hardware used to carry the full mechanical tension of  
10 conductors rather than merely supporting their weight) not otherwise visible through traditional  
11 asset inspections. This is particularly the case in areas with challenging terrain or dense  
12 vegetation where ground inspections are difficult or unsafe.

13 Similarly, the RIDI inspection prioritization model implemented in 2023—based on  
14 situational and asset awareness gained through the comprehensive inspections performed from  
15 2019-2022—was able to identify and prioritize poles not otherwise due for a detailed inspection  
16 but that had additional potential risk identified through a drone inspection through DIAR. Below  
17 are photos showing the image collected during DIAR and the photo collected during the 2023  
18 RIDI. These illustrate that enabling a risk-informed inspection strategy versus time-based was  
19 necessary to support SDG&E’s wildfire mitigation strategy.

1

**Figure JK- 6: Damaged Pole (P812049)**



**DIAR Tier 3 – 4/25/2022**



**RIDI - 8/14/2023**

3

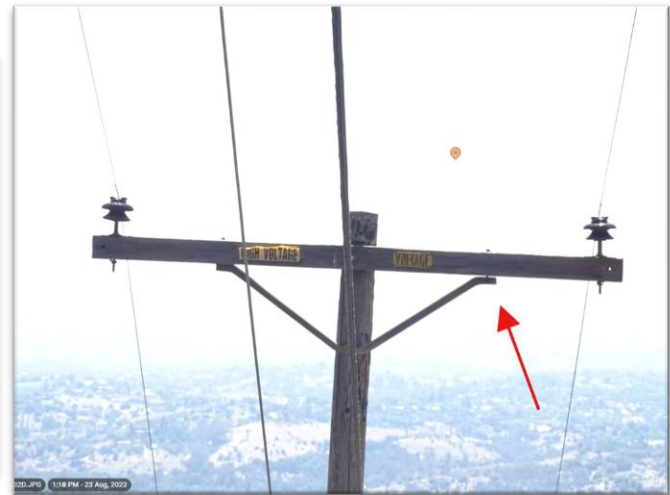
4

5

**Figure JK- 7: Missing Hardware (P411485)**



**DIAR Tier 3 – 12/11/2019**



**RIDI - 8/23/2023**

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12

1

**Figure JK- 8: Damaged Crossarm (P176389J)**



**DIAR Tier 3 – 11/25/2019**



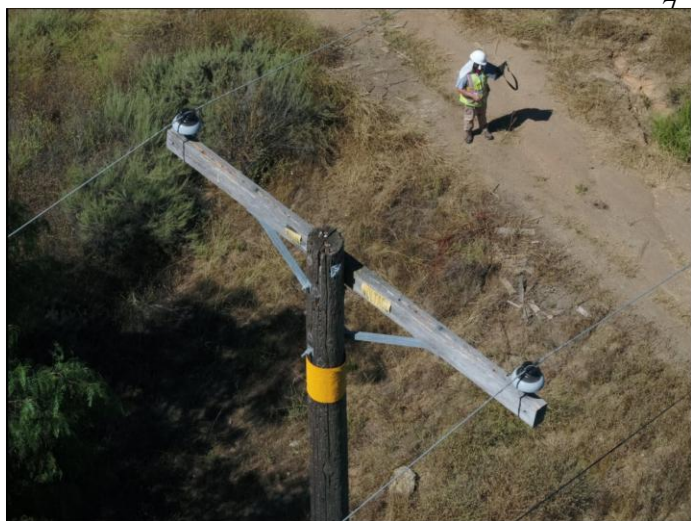
**RIDI – 6/28/2023**

4

5

6

**Figure JK- 9: Damaged Pole (P200756)**



**DIAR Tier 3 – 6/10/2020**



**RIDI - 3/14/2023**

8

9

10 **Q. Describe the scope of technologies, including Artificial Intelligence and Machine**  
11 **Learning, in implementing the DIAR and RIDI programs.**

12 **A. The scope of technologies involved in the DIAR and RIDI programs fell into three**  
13 **general categories: Software, Data Management and AI/ML.**

1           **1.     Software**

2   When SDG&E started the DIAR program in 2019, we needed to find a way to perform flight  
3   planning and execution at scale. This included the ability to upload, store and visualize over  
4   700,000 drone images anticipated to be collected for the approximately 40,000 distribution poles  
5   in the Tier 3 HFTD. SDG&E also needed a solution that allowed inspectors to review the images  
6   and identify potential fire and safety hazard issues, perform QA/QC of the inspection reports,  
7   and publish the findings for further corrective work management.

8   For flight planning and inspection, we examined software options already in use by SDG&E and  
9   met with several external vendors with inspection software solutions related to imagery and  
10   drones. Through the bidding process, SDG&E selected a software solution that required the  
11   payment of license fees, implementation of custom enhancements needed to support DIAR  
12   workflows, including QA/QC review processes, cloud data storage and integration with the other  
13   work management solutions discussed below. This software solution was used from 2019-2023  
14   to support the over 100,000 flights and inspections performed and remains operational to support  
15   the RIDI program in current form.

16           **2.     Data Management**

17   SDG&E also required a work management system to record and track flights, inspections, and  
18   management of findings through repair completion and reporting. SDG&E tracked both the  
19   flights completed by the pilots as well as flights delayed because of permitting or other  
20   authorizations, access issues, customer issues, and other constraints. Inspection tracking included  
21   identifying inspections that were complete and awaiting QA/QC and finalized reports. Finally,  
22   management of the findings required the ability to identify the type of issue, severity of issue for  
23   prioritization, location for grouping efficiency, level of effort needed for engineering or design,

1 type of repair resulting from the engineering for reporting and cost forecasting (*e.g.*, pole  
2 replacement, crossarm replacement, other type of engineering repair), tracking of the status of  
3 engineering for construction readiness, environmental review, permitting needs, land rights  
4 issues, issuance to construction, construction status, redesign or additional information needed  
5 for construction, as-built receipt, true-up and QA/QC and close-out.

6           SDG&E examined options already in use at the company, but because no single  
7 enterprise system existed to manage all phases of work, it elected to retain the services of an  
8 external vendor to develop a custom tracking and reporting solution, including databases and  
9 Power BI dashboards specifically for DIAR that would support internal management of the  
10 repairs and reporting to Energy Safety. This work was necessary to track inspection targets,  
11 translate inspection findings into actionable, auditable work records and to support program  
12 close-out and data migration, as well as produce weekly, monthly, and ad-hoc reports to respond  
13 to data requests and provide regulatory support.

### 14           **3.     AI/Machine Learning**

15           SDG&E's efforts in the development of artificial intelligence and Machine Learning  
16 began prior to the start of DIAR with the goal of promoting cost efficiency by enhancing and  
17 expediting review of images for various purposes. In late 2018, SDG&E initiated a bid  
18 solicitation event for services related to intelligent imagery with the goal of creating a centralized  
19 platform for imagery management and development of Machine Learning models that could  
20 potentially be utilized for project planning, improvements to asset data, enhancement of  
21 inspections, vegetation management and environmental services. Specifically, SDG&E  
22 investigated the ability to use Machine Learning models to identify assets, perform  
23 measurements and assess damage of overhead electric facilities, as well as recognize

1 environmental issues, such as dense vegetation areas. At that time, there were no vendors with  
2 “off the shelf” Machine Learning capabilities. SDG&E ultimately received three vendor  
3 proposals through a competitive bidding process that involved the development of Machine  
4 Learning capabilities and required the collection of additional imagery that could be used to train  
5 and develop the Machine Learning models, which also required the time of subject matter  
6 experts such as QEWs and engineers.

7 In 2019, SDG&E’s digital innovation group also completed a pilot project unrelated to  
8 WMP efforts with an external IT vendor exploring this same technology. The result of the pilot  
9 concluded that the technology existed to develop Machine Learning capabilities, but that effort  
10 would require larger image datasets and labeling of assets and different damage types to be  
11 successful.

12 Ultimately, developing Machine Learning model capabilities as part of the DIAR  
13 program offered cost efficiencies, along with potential to reduce ongoing labor costs from the  
14 DIAR program and expedite review of drone inspection images to identify high risk issues. From  
15 the outset, the drone program offered not only the opportunity to collect imagery for human  
16 review, but also to generate high-quality labeled datasets that could be used to develop Machine  
17 Learning models capable of automated asset identification and damage detection on overhead  
18 electric facilities. These models could ultimately be expanded beyond the drone program and  
19 into other aspects of SDG&E’s business operations to further achieve cost efficiencies.

20 During the early phase of this process, drone imagery captured was reviewed by QEWs  
21 and the findings from these human inspections were used to train and validate early  
22 computer-vision models to identify assets and potential fire and safety hazards on overhead  
23 distribution infrastructure. To operationalize these capabilities once developed, SDG&E created

1 the IIP platform. IIP is an enterprise, cloud-based system that applies AI and Machine Learning  
2 models to imagery collected from drones, fleet vehicles, and mobile devices. IIP’s core function  
3 is to automatically detect electric assets, identify damage conditions, and integrate risk insights  
4 into SDG&E’s compliance and operational workflows for qualified review and action.

5 IIP was explicitly developed as a “human + machine” partnership, in which Machine  
6 Learning models can rapidly triage large volumes of imagery while human inspectors retain  
7 responsibility for final assessment and repair decisions. This approach was intended to improve  
8 consistency, scalability, and timeliness of inspections without replacing qualified human  
9 judgment. By the end of 2020, SDG&E had developed over 30 Machine Learning models with  
10 basic asset and damage detection capabilities using the imagery collected from DIAR.

11 Starting in 2021, SDG&E harnessed these IIP digital capabilities to accelerate AI and  
12 Machine Learning to support wildfire mitigation and compliance activities.<sup>13</sup> SDG&E was the  
13 first utility to explore and operationalize IIP technology in this fashion. Among other things,  
14 Machine Learning model capabilities included:

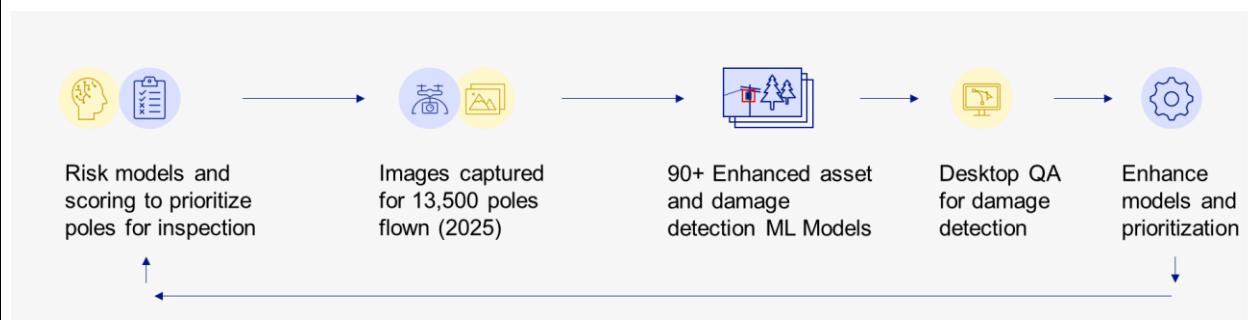
- 15 • Automated asset identification on overhead electric structures used to better  
16 inform our asset management strategy and risk understanding;
- 17 • Damage and defect detection relevant to wildfire risk and system safety;
- 18 • Third-party attachment and equipment detection on poles for improved  
19 notification to responsible parties related to communication equipment hazards in  
20 conformance with GO 95 Rule 18 and better understanding of asset risk related to  
21 unauthorized attachments; and
- 22 • QA/QC of drone inspections to identify any potential damages missed by the  
23 inspector.

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<sup>13</sup> See SDG&E 2023-2025 Base WMP (October 23, 2023) at 232-233.

1 SDG&E also continued to develop and refine additional models. At the end of 2022,  
2 SDG&E had collected over 1.9 million images from DIAR and developed 75+ asset  
3 identification and damage detection models that were used to QA/QC over 65,000 drone  
4 inspections performed by Qualified Inspectors.

5 The Machine Learning capabilities developed through DIAR were also integrated into  
6 SDG&E's RIDI framework at the end of 2022 to support the scope of RIDI inspections in 2023;  
7 this framework is still in use today with over 90 Machine Learning models in operation. To  
8 support RIDI, outputs from the Machine Learning models—such as asset condition indicators  
9 and detected anomalies—were combined with other risk inputs (e.g., asset health and  
10 consequence-of-failure considerations) to inform inspection planning and prioritization in the  
11 HFTD and WUI areas. The illustration below provides a visual representation of the integration  
12 of AI and data analytics into RIDI informing both the scope of inspections and improving the  
13 quality of inspections.



15 Through early 2023, SDG&E had used IIP to assess over two million images to identify  
16 twenty different types of damage with an accuracy rate of over 85%. The accuracy and efficacy  
17 of the IIP tool was heavily reliant on the volume of data obtained during the 2019-2022 period;  
18 without the number of images obtained early in the program, IIP tool development and accuracy  
19 could have been compromised and the achieved efficiencies might not have been realized. IIP  
20

1 development was also a standalone initiative in SDG&E’s 2023-2025 WMP (WMP.1342),  
2 generating compliance obligations under SDG&E’s WMP.<sup>14</sup>

3 SDG&E has also leveraged lessons learned and technologies developed to share and  
4 support development of similar inspection programs across the country. Use of drones for  
5 inspections is increasingly recognized as a best practice in a comprehensive asset management  
6 regime. SDG&E actively shares information about its drone program, data, and AI capabilities  
7 developed through IIP with other investor-owned utilities (IOUs) and the broader utility  
8 industry<sup>15</sup> through formal collaboration groups, including the Utility Inspection & Geospatial  
9 Alliance, the Open Power AI Consortium (an EPRI venture), and the AWS Energy & Utilities  
10 Customer Advisory Council. SDG&E also regularly educates and exchanges lessons learned  
11 through industry conferences and forums, including recent presentations at DistribuTECH on the  
12 evolution of compliance using drones, data, and AI.<sup>16</sup> This collaboration helps advance industry  
13 best practices while ensuring SDG&E’s investments deliver value beyond a single utility.

14 **Q. Please provide an overview of the internal and external personnel that worked on**  
15 **this Program and contributed to the costs?**

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<sup>14</sup> See *id.* at 137 (describing WMP three year objectives, including “[c]ontinue intelligent image processing, utilizing artificial intelligence and innovation to detect damage to high fire risk distribution assets and vegetation.”).

<sup>15</sup> AmazonNews, *How machine learning and drones are helping prevent wildfires, Using AWS image recognition tools, San Diego Gas & Electric is reimagining the 140-year-old utility for today’s demands, and tomorrow’s climate* (May 17, 2022) available at <https://www.aboutamazon.com/news/aws/how-machine-learning-and-drones-are-helping-prevent-wildfires>.

<sup>16</sup> DTECH, 2026 Event Schedule, *Evolution of Compliance Risk Assessment* (February 5, 2026) available at <https://www.distributech.com/2026-event-schedule/evolution-of-compliance-risk-assessment>.

1 A. For DIAR, management and oversight of the program was performed by internal SDG&E  
2 employees with the support of an external Project Management Office (PMO) contractor to  
3 provide staffing resources necessary to manage the program. The inspection work was performed  
4 by external drone pilots and QEW inspectors. Support for inspections and construction repair  
5 work, including safety, security, environmental, aviation, access protocol, and customer relations  
6 was also provided by external contractors. Technology support for software, data management  
7 and AI/ML was performed by external contractors with SDG&E management direction and  
8 oversight. Engineering and support services related to repairs was also performed by external  
9 contractors with SDG&E management and oversight. SDG&E supply management follows  
10 established processes to address competitive contractor rates and cost efficiency, as further  
11 discussed below.

12 When RIDI was implemented in 2023, management and oversight was performed solely  
13 by internal SDG&E employees with no PMO support, in part due to knowledge gained over the  
14 course of the program as well as the reduction in the required number of inspections. The  
15 inspections were performed by external drone pilots and QEW inspectors. Support for  
16 inspections and construction repair work, including safety, security, environmental, aviation,  
17 access protocol, and customer relations was provided by external contractors. Technology  
18 support for software and AI and Machine Learning was performed by external contractors with  
19 SDG&E management direction and oversight; however, data management transitioned to the use  
20 of internal systems and was primarily performed by internal employees. Engineering,  
21 construction, and support services related to repairs were also primarily performed by internal  
22 resources.

1 **Q. What was the procurement strategy for the external vendors and contractors that**  
2 **performed work on this Program?**

3 A. In 2019, SDG&E utilized an existing master service agreement (MSA) for Program  
4 Management services that had negotiated rates and the requisite insurance requirements  
5 (including aviation liability insurance) to start the drone program. The drone vendors,  
6 engineering and other inspections and repair support contractors were subcontractors to the  
7 prime under this existing MSA. Existing agreements with SDG&E's Aviation Services group  
8 were also utilized to provide safety and security support to the drone pilot teams and ensure that  
9 drone inspections were performed safely and in compliance with all Federal Aviation  
10 Administration requirements. Multiple vendors were also engaged to identify a platform that  
11 would support flight planning, image capture/upload, and inspections. The procurement strategy  
12 allowed SDG&E to establish workflows and processes and develop a project execution plan that  
13 was then used to develop scopes of work for the next phase of inspections in Tier 2 that started in  
14 2021.

15 In 2021, SDG&E utilized a new Project Management Organization (PMO) that was  
16 selected through a competitively bid request for proposal effort. The PMO provided support  
17 related to overall program management, flight/assessment planning and management, public  
18 outreach support, environmental and permitting support, technology and data management,  
19 project controls and reporting, issue repair tracking, management and support, engineering and  
20 construction coordination, and close-out.

21 SDG&E also competitively bid the image capture and inspection work and field aviation  
22 safety/security support this next phase of DIAR. The drone vendor and inspection contractor that  
23 was selected in 2021 as a result of the competitive request for proposal process and continued to

1 be utilized for the 2023 inspection work. However, SDG&E negotiated with the vendor to reduce  
2 the per pole unit rate for inspections starting in 2023 because of improved pilot experience,  
3 improved customer coordination that facilitated improved inspection production, and other  
4 process improvements resulting from lessons learned over the 2019-2022 period.

5 Construction services performed by external contractors throughout 2019-2023 were  
6 subject to competitively bid MSAs with SDG&E's Construction Management department.  
7 Material procurement used for repairs also goes through the Supply Management department and  
8 is competitively bid on a regular basis and undergoes a robust quality assurance inspection  
9 process.

10 Finally, SDG&E used an MSA that was competitively bid in 2017 to perform the work  
11 related to IIP and developing the Machine Learning models.

12 With the transition to RIDI in 2023 and use of SDG&E's internal work management  
13 system, an outside PMO was no longer needed to support RIDI, however, the PMO remained to  
14 support ongoing DIAR repair work and reduce the instance of backlogs. External engineering  
15 groups and construction contractors were also used for the majority of DIAR repairs, as well as  
16 RIDI repairs where internal resources were not available or had limited capacity.

17 **Q. Where do these inspections occur?**

18 A. From 2019-2020, DIAR inspections occurred in the Tier 3 HFTD. In 2021-2022, after  
19 completion of all in scope overhead electric distribution infrastructure in Tier 3, SDG&E  
20 continued the DIAR program with inspections of the entire Tier 2 HFTD and higher wildfire risk  
21 areas within the WUI.

22 In 2023, upon the transition of DIAR to a risk informed cyclical inspection program,  
23 RIDI, SDG&E used an inspection prioritization model to conduct inspections of the highest risk

1 assets across the Tier 2 and Tier 3 HFTD and higher risk WUI areas. Cyclical, risk informed  
2 drone inspections of infrastructure continue as a component of SDG&E's WMP.

3 **Q. Is this program specifically limited to the HFTD? If not, are the costs recorded to**  
4 **SDG&E's WMPMA limited to costs to implement this program in the HFTD?**

5 A. No, the program was not specifically limited to the HFTD. Costs of inspection and repair  
6 of poles within select and higher risk areas of the WUI were also recorded in SDG&E's  
7 WMPMA, consistent with SDG&E's 2023 WMP.<sup>17</sup>

8 **Q. If the program scope and costs includes work outside the HFTD, why?**

9 A. From 2021-2023, SDG&E performed approximately 6,200 drone inspections in the WUI  
10 through the DIAR and RIDI programs. The majority of these poles were located in coastal  
11 canyon areas, which pose a unique fire risk due to terrain and winds during Santa Ana  
12 conditions. SDG&E focused additional resources, such as drone inspections, in these coastal  
13 canyon areas in part due to the Coastal Fire in 2022, during which an ignition in such an area led  
14 to the destruction or damage of 32 structures and two firefighter injuries.<sup>18</sup>

15 In addition, some WUI areas, especially coastal canyons, present limitations in traditional  
16 inspection effectiveness due to steep slopes, dense vegetation, limited access roads and narrow  
17 rights of way with many environmental constraints. Ground inspections in these areas are slower  
18 and often inspectors have difficulty safely accessing pole tops and crossarms. This leads to  
19 potential misses in identifying damages that could result in an ignition event.

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<sup>17</sup> See SDG&E 2023-2025 Base WMP (October 23, 2023) at 40, 140.

<sup>18</sup> FEMA, California Coastal Fire, FM-5439-CA, available at  
<https://www.fema.gov/disaster/5439#local-resources>.

1 Drone inspections of this infrastructure were a reasonable means of identifying non-  
2 obvious issues on electrical infrastructure in the WUI given the comparatively lower cost of  
3 inspections and repairs versus SDG&E’s hardening programs, and in light of the risk of  
4 catastrophic fire in the event of an ignition in the WUI. The WUI poses specific risk because it is  
5 where electric infrastructure, dense vegetation, and communities intersect, meaning that even  
6 minor equipment failures can escalate into catastrophic wildfires. Due to the proximity of larger  
7 populations, ignitions in or near the WUI pose the potential for catastrophic damage, as  
8 evidenced by the Eaton Fire, which burned into a WUI area.<sup>19</sup> In 1985, San Diego experienced  
9 the Normal Heights Fire, a destructor urban wildfire that—in part due to its proximity to larger  
10 population density—destroyed or damaged over 100 structures, left hundreds homeless, and  
11 caused widespread devastation across 300 acres.

12 Further, drone inspections of infrastructure advanced SDG&E’s situational awareness  
13 capabilities, facilitating better PSPS decision-making for infrastructure in high-risk areas, which  
14 include the WUI depending on wind and other conditions. This is further discussed later in my  
15 testimony.

16 **Q. What is the cycle and scope for inspections under this Program and how was this**  
17 **determined?**

18 The Program was divided into three phases between 2019-2023: DIAR Tier 3, DIAR Tier  
19 2/WUI and RIDI. All three phases had slightly different cycles and scope for inspections.  
20

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<sup>19</sup> CALMatters.org, The LA County fires devastated homes in the wildland urban interface. Here’s what that is (January 28, 2025) available at <https://calmatters.org/environment/wildfires/2025/01/la-county-fires-wildland-urban-interface/>.

1           **1.       DIAR Tier 3**

2           From 2019-2020, SDG&E inspected all distribution overhead poles in the Tier 3 HFTD,  
3 our highest fire risk area. Approximately 2,000 poles were removed from the scope of  
4 inspections since they had been recently replaced through other programs.

5           **2.       DIAR Tier 2**

6           In 2020, SDG&E formed a multidisciplinary leadership team formed to review the  
7 existing DIAR program and explore future options. Representatives on the team included  
8 personnel from ten different departments including project management, QA/QC, electric  
9 operations, aviation services, wildfire mitigation, construction services, asset management,  
10 supply management, engineering, and central business planning. The team reviewed the  
11 inspections already performed, the types of issues identified, and the number and severity of  
12 findings identified; compared drone inspections with traditional inspection results; discussed the  
13 efficacy of ground versus aerial inspections; reviewed program processes and procedures as well  
14 as lessons learned; and examined historical financials and future forecasts for multiple scenarios  
15 related to repair completion and inspection cycles, including discontinuing drone inspections  
16 after Tier 3 HFTD was complete. Ultimately the team concluded that drones were a valuable  
17 tool and should be used to support future inspections.

18           Based on this effort, SDG&E elected to continue DIAR in the Tier 2 HFTD to support  
19 development of a complete baseline of our distribution system in the HFTD, reduce overall  
20 wildfire risk, and allow time to incorporate drone inspections and lessons learned into SDG&E's  
21 CMP program. Scope and structure of the program expansion was approved by SDG&E senior  
22 leadership. DIAR Tier 2 included inspections and associated repairs of the entire Tier 2 HFTD  
23 and higher risk WUI areas. From 2021-2022, approximately 3,000 distribution poles were

1 descoped from Tier 2 HFTD inspections due to recent replacement or scheduled replacement or  
2 removal through other programs.

3 Drone inspections performed from 2019-2022 allowed SDG&E to obtain a full system  
4 health baseline for SDG&E's HFTD and higher risk WUI areas and obtain data necessary to  
5 implement a more informed risk-based inspection program in later years.

### 6 **3. RIDI**

7 Based on completion of DIAR inspections, SDG&E evaluated program results and  
8 determined that continuing a blanket approach to drone inspections would likely yield  
9 diminishing wildfire risk-reduction benefits, given the interval inspection timelines. At the same  
10 time, DIAR imagery and repair outcomes enabled the development of advanced risk models and  
11 IIP tools capable of improved prediction of assets that posed the greatest risk of having a  
12 condition that could pose a fire or safety hazard. SDG&E used this information to explore  
13 development of a risk informed drone inspection program, targeting these assets to obtain longer-  
14 term program cost efficiencies on an ongoing basis.

15 Consistent with OEIS guidance emphasizing risk-informed mitigation, SDG&E  
16 discontinued DIAR and launched the RIDI program in 2023.<sup>20</sup> RIDI shifted the program scope  
17 from HFTD-wide coverage to targeted inspection of the highest-risk assets. At the same time,  
18 SDG&E discontinued the HFTD Tier 3 inspections, which targeted approximately 13,500 poles  
19 inspections solely in the Tier 3 HFTD annually, to further obtain efficiencies. Similar to the  
20 HFTD Tier 3 Inspection Program targets, SDG&E elected to plan drone inspections of

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<sup>20</sup> See, e.g. SDG&E 2023-2025 Base WMP (October 23, 2023) at 44 (discussing improvement in asset inspections through risk informed prioritization of drone inspections beginning in 2023).

1 approximately 13,500 poles annually, or approximately 15% of poles in the HFTD and higher  
2 risk WUI areas.

3 Under RIDI, the poles selected for inspection were not fixed or purely time-based like  
4 traditional inspection efforts. Instead, SDG&E developed a model that incorporated consequence  
5 of wildfire risk data, asset data (e.g., age, location, material, height, elevation, number of  
6 attachments), environmental considerations, such as higher wind areas and soil types, as well as  
7 damage predictions from ML models run on imagery from prior years. For example, drone  
8 imagery may have identified minor crossarm degradation that did not require repair at that time,  
9 but that information was used to inform the inspection prioritization model of the higher  
10 potential risk related to that facility as the passage of time could increase the extent of the  
11 damage. Once all of the poles received a risk score, the scope of inspections was reviewed to  
12 take into account navigation efficiency that would help decrease per pole inspection costs by  
13 selecting poles in similar areas.

14 **Q. Did you make any changes to the Program between phases to reduce costs?**

15 A. Yes. DIAR Tier 3 included a field-support model that included dedicated visual observers  
16 paired with drone pilots and increased aviation, safety and public relations field staffing. Based  
17 on experience gained during the DIAR Tier 3, DIAR Tier 2 reduced the number of field  
18 personnel by eliminating the visual observer and pairing the drone pilot with a QEW Inspector  
19 and reducing the ratio of aviation safety support to inspection crew. We also reduced the image  
20 capture requirements from three levels to two levels (eliminating shots required from below the  
21 conductor) and replacing those with a ground capture. This reduced the average number of  
22 images per pole from ~40 to ~20.

1 SDG&E also saw efficiencies from software improvements over time, including more  
2 integrated flight planning and navigation tools. Use of competitive bidding also reduced and  
3 fixed the inspection costs and improved contractor rates in multiple areas. Finally, elimination of  
4 the startup costs and increased experience of program personnel in all areas contributed to  
5 increased production and lower overall costs.

6 For RIDI, the reduction in the number of inspections, a negotiated decrease in the per  
7 pole inspection costs, elimination of the PMO and use of more SDG&E internal resources and  
8 enterprise workflows was all done to reduce program costs without compromising, quality,  
9 safety or compliance.

10 **Q. Are there any compliance requirements associated with this program?**

11 A. Yes. The program is a regulated wildfire mitigation activity approved by the CPUC and,  
12 subsequently Energy Safety through SDG&E's WMPs, which establish mandatory annual  
13 targets, scope, and funding levels that SDG&E is required to implement; failure to execute these  
14 approved programs would expose SDG&E to regulatory enforcement and potentially jeopardize  
15 its ability to obtain a safety certificate. The program is subject to oversight and verification by  
16 Energy Safety and independent evaluators, who, pursuant to statutory requirements, assess  
17 whether SDG&E funded and implemented approved WMP activities as committed, including  
18 drone inspections and resulting repairs.<sup>21</sup>

19 GO 95, Rule 31.2 also requires SDG&E to inspect lines "frequently and thoroughly for  
20 the purpose of ensuring that they are in good condition so as to conform with" GO 95. Drone

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<sup>21</sup> See Public Utilities Code Section 8386.3.

1 inspections are part of our inspection strategy to support the health of our overhead lines in the  
 2 HFTD and WUI.

3 **Q. What were SDG&E’s program targets for the DIAR and RIDI programs in its**  
 4 **WMP?**

5 A. The table below provides the WMP targets for the subject years. However, while the  
 6 WMP target represents inspection units only, the WMP cost targets include forecasted repair  
 7 costs for the over 25,000 issues identified by DIAR and RIDI inspections from 2019-2023.

8 **Table JK- 7: Drone Program WMP Targets (\$000s)**

<b>Target</b>	<b>2019</b>	<b>2020</b>	<b>2021</b>	<b>2022</b>	<b>2023</b>	<b>Total</b>
WMP Target Capital (\$)	\$-	\$3,600	\$13,595	\$26,402	\$80,740	<b>\$124,337</b>
WMP Target O&M (\$)	\$-	\$50,500	\$35,358	\$52,000	\$53,171	<b>\$191,029</b>
WMP Target (Inspection Units)	0	33,000	22,000	22,000	13,692	<b>90,692</b>

9  
 10 **Q. Did SDG&E achieve its WMP targets?**

11 A. SDG&E met or exceeded its inspection targets for 2019-2023. The table below provides  
 12 the actual spend and inspections performed for the subject years. Please reference the Drone  
 13 Investigation Assessment and Repair workpapers found in SDG&&&E-T3-WMPMA-07-E for  
 14 additional information.

15 **Table JK-108: Drone Program Actual Spend and Inspections (\$000s)**

<b>Actual</b>	<b>2019</b>	<b>2020</b>	<b>2021</b>	<b>2022</b>	<b>2023</b>	<b>Total</b>
Capital (\$)	\$274	\$16,145	\$12,890	\$32,266	<del>\$34,981</del> \$60,666	<del>\$96,555</del> <u>\$122,241</u>
O&M (\$)	\$13,557	\$45,964	\$33,170	\$44,755	\$53,301	<b>\$190,747</b>
Inspections	10,524	26,787	23,081	25,976	15,234	<b>101,602</b>

1 **Q. Are drone inspections coordinated with any other programs?**

2 A. Yes. As previously mentioned, from 2019-2022, in scoping drone inspections SDG&E  
3 excluded poles scheduled for replacement or recently replaced. Generally, however, DIAR  
4 inspections were not conducted in conjunction with any other programs. This practice was  
5 consistent with Energy Safety’s findings and requirements that, “[w]hile drone inspections are  
6 useful to supplement routine inspections, SDG&E must demonstrate that its personnel are  
7 continuing to properly perform routine distribution inspections.”<sup>22</sup>

8 Part of the reason for conducting drone inspections independently of traditional  
9 inspection programs was to provide an objective and statistically meaningful way to evaluate the  
10 advantages of drone inspections versus traditional alternatives by creating an independent  
11 verification dataset. Executing drone inspections separately—rather than integrated with ground  
12 patrols or detailed inspections— allowed SDG&E to assess whether existing programs  
13 consistently identified the same conditions, whether certain defect types were missed in specific  
14 inspection programs, and whether inspection frequencies, methods, or scopes were appropriately  
15 calibrated to actual field conditions. Maintaining independent inspection programs during this  
16 period reduced confirmation bias, prevented inspectors from being influenced by prior findings  
17 or prior work performed on the same assets, and enabled a clearer comparison of detection rates,  
18 condition severity, and corrective outcomes. As a result, drone inspections were used as a  
19 diagnostic tool to validate assumptions underlying traditional programs, identify systemic gaps  
20 or strengths, and support continuous improvement by informing adjustments to inspection

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<sup>22</sup> SDG&E 2023-2025 Base WMP (October 23, 2023) at 45.

1 methodologies, prioritization, and resource allocation—without undermining or duplicating the  
2 core compliance function of existing inspection requirements.

3         Additionally, during this time, drone inspections were limited to only identifying  
4 potential fire and safety conditions, therefore drone inspections did not qualify to meet the  
5 compliance requirements of Detailed inspections.

6         In 2023, RIDI expanded the scope of inspection beyond just identifying potential fire and  
7 safety hazards, to include conditions required for identification during Detailed Inspections. With  
8 this change, SDG&E cancelled detailed inspections on poles within the scope of RIDI in 2023,  
9 and the RIDI inspection satisfied compliance requirements for Detailed Inspections. This  
10 resulted in approximately 2,000 Detailed Inspections being removed from scope, reducing  
11 redundancy of inspections and saving costs for Detailed Inspections. These efficiencies were  
12 gained as a product of the volume of data obtained over the 2019-2022 DIAR program, allowing  
13 for confidence in utilizing drone inspections to satisfy other inspection program requirements

14 **Q. Did you make any changes to your traditional inspection programs as a result of**  
15 **lessons learned with the drone program?**

16 A. Yes. SDG&E made targeted changes to its traditional inspection programs based on  
17 lessons learned from the drone inspection program. Specifically, we concluded that while drones  
18 are particularly effective at identifying certain high-risk asset conditions—especially damages  
19 not easily visible from the ground – there were other changes that could improve the quality of  
20 our traditional inspections.

21         First, we started a dedicated inspection team for overhead inspections and patrols where  
22 individuals received focused training related to identification of conditions associated with  
23 potential fire, safety, reliability or compliance risk, and were not necessarily involved in the

1 construction of the facilities or corrective work performed. This training facilitated independence  
2 and reduced potential inconsistent priorities between the individuals performing inspections and  
3 those responsible for constructing and maintaining the facilities. It also generated cost savings by  
4 prioritizing resources to perform repairs.

5         Next, SDG&E developed enhanced training for all personnel to improve the quality of  
6 inspections. Specifically, we recognized the need to reinforce the importance of identifying  
7 customer hazards and hazards related to communications infrastructure during inspections. We  
8 also updated the inspection software and equipment used by inspectors to make it easier for  
9 inspectors to access facilities, complete the inspection and take photos of damages identified  
10 during inspections. Finally, we identified the need to update our condition codes and work  
11 management processes. All these changes are in various stages of implementation.

12 **Q. Describe any studies on the effectiveness of this program**

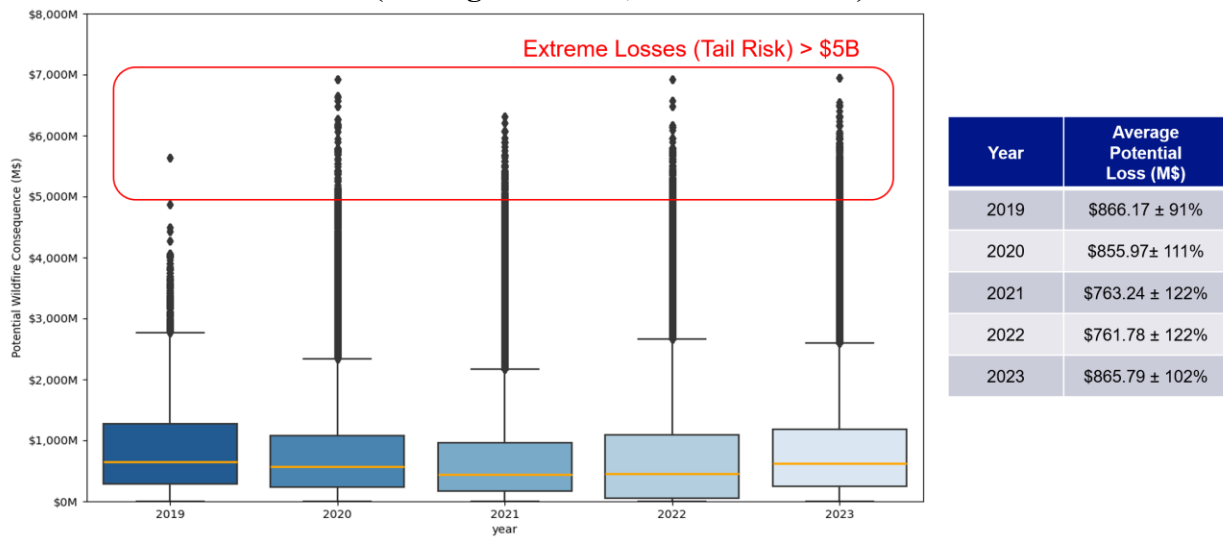
13 A. In 2022, SDG&E completed a third-party supported analysis evaluating the effectiveness  
14 of its drone inspection program. The study reviewed multiple years of drone and traditional  
15 ground inspection data and found that drone inspections materially improved the identification of  
16 high-risk asset conditions, including accelerating the detection of emergency-level damage  
17 compared to traditional inspection methods. These findings helped inform the evolution of  
18 SDG&E's drone inspection program from DIAR to the RIDI program that start in 2023, as well  
19 as its integration into our broader asset management and wildfire mitigation strategy. A copy of  
20 this study is attached as Appendix A to this testimony.

21 **Q. Describe any studies or estimates on the wildfire risk reduction from this program.**

22 A. From 2019-2023, drone inspections identified, on average, 18% more potential fire  
23 hazards than traditional detailed overhead CMP inspections within the SDG&E inspection

1 workflow. An evaluation of potential wildfire impacts during extreme fire weather, based on the  
 2 locations of High-Priority Infractions identified through 2019–2023 drone inspections, estimates  
 3 that an average potential wildfire resulting from these infractions could have resulted in costs of  
 4 approximately \$829 million. Additionally, this analysis reveals a significant wildfire tail risk in  
 5 SDG&E's service territory, with certain high-consequence locations projecting potential damages  
 6 exceeding \$5 billion.<sup>23</sup>

7 **Figure JK- 1010: Distribution of Estimated Wildfire Consequences**  
 8 **(Average ≈ \$829M; Tail Risk > \$5B)**



9 The analysis underscores that if even one of the 86,162 inspections completed from 2019-  
 10 2022 and the 15,234 inspections in 2023 identifying one of the 365 emergency or 35,114 other  
 11 asset repairs or replacements were missed and subsequently resulted in an ignition under  
 12 potential worst-case fire-weather conditions, the financial and safety consequences of that  
 13

<sup>23</sup> Wildfire consequence values were calculated using Technosylva’s 2025 estimates for acres burned and structures destroyed under 24-hour unsuppressed fire simulation scenarios. These simulations were conducted for selected days between 2013 and 2025 when extreme fire weather conditions were present, ensuring that the estimates reflect high-risk scenarios consistent with historical patterns of severe wildfire behavior. Dollar conversion factors for structures destroyed and acres burned estimates are detailed in SDG&E 2026–2028 Base WMP (September 30, 2025), available at [https://www.sdge.com/sites/default/files/regulatory/SDG%26E\\_2026-2028\\_Base-WMP\\_R2.pdf](https://www.sdge.com/sites/default/files/regulatory/SDG%26E_2026-2028_Base-WMP_R2.pdf).

1 incident alone would far exceed the total ~~\$324~~350<sup>24</sup> million cost of SDG&E’s drone programs,  
2 fully justifying the costs from a cost-benefit perspective. These findings highlight the  
3 disproportionate financial and safety risks associated with missed high-priority repairs and  
4 reinforce the cost-effectiveness of proactive drone-based inspections and repairs as a critical  
5 wildfire mitigation strategy.

6 **Q. Did SDG&E consider any alternatives to this program?**

7 A. Yes. Drone inspections compared favorably to alternatives, principally because they  
8 identified issues that are less obvious during other inspections. Further, alternative inspection  
9 methods of these assets were sometimes impossible or not cost-effective, as many of the poles  
10 and wires in SDG&E’s HFTD areas are in remote or sometimes inaccessible areas. The benefits  
11 of drone use for inspection has been the subject of various studies with the conclusion that  
12 “drones can decrease the time and cost of the inspection, while increasing the reliability, safety  
13 of the inspection, and data consistency.”<sup>25</sup> Alternatives considered the use of helicopters, bucket  
14 trucks, and climbing and are further discussed below.

15 **4. Helicopters**

16 The use of a helicopter for inspections of distribution infrastructure requires low-altitude  
17 operations, creating significant noise and dust impacts. Further, it is difficult to observe all  
18 conditions from the vantage point of a helicopter, a fact similarly noted by PG&E in describing  
19

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<sup>24</sup> Cost reflects fully loaded program costs.

<sup>25</sup> MDPI, Drone-Based Non-Destructive Inspection of Industrial Sites: A Review and Case Studies (2021) at 23, available at <https://www.mdpi.com/2504-446X/5/4/106>.

1 why it elected to end most helicopter inspections in lieu of drone alternatives.<sup>26</sup> PG&E also noted  
2 that helicopters failed to offer sufficient image quality. Another study also found that helicopter  
3 inspections can miss issues clearly identified by drones.<sup>27</sup>

#### 4 **5. Bucket Trucks**

5 Bucket trucks require physical access to each pole, which is resource intensive, time-  
6 consuming, environmentally impactful, and operationally impractical. Roads do not exist to all  
7 SDG&E distribution assets, so the use of bucket trucks is improbable, if not impossible, in many  
8 locations.

#### 9 **6. Climbing**

10 Climbing poles to observe and inspect for issues is not reasonable, practical, or safe, as  
11 climbing poles to observe electrical components from above requires outages and puts workers at  
12 a greater safety risk. Drones offered superior efficiency and precision while minimizing  
13 environmental disruption, making them an optimal solution for asset inspections.

#### 14 **Q. Did SDG&E's drone programs include repairs?**

---

<sup>26</sup> PG&E 2023-2025 WMP R8 (February 13, 2025) at 488, available at <https://www.pge.com/assets/pge/docs/outages-and-safety/outage-preparedness-and-support/021325-2023-2025-wmp-r8.pdf>. (“Drones will be the main vehicle of inspection...”) (*See also* at 1075-1088, discussing various aerial and ground inspection methodologies and concluding “the drone only method is the most promising for aerial inspections in the near-term. The value proposition for aerial inspections lies in detecting conditions that are challenging to see, especially those that are so severe as to create an immediate ignition or public safety risk. ... It was the methodology with the lowest unit cost and the ability to scale the most quickly since both image capture and desktop inspection can be done rapidly. Helicopter-only inspections produced lower quality pictures at a higher unit cost. Due to the challenges associated with helicopter-only inspections, PG&E believes that helicopter-only is better used to supplement other aerial methods as needed or considered as a longer-term opportunity.”).

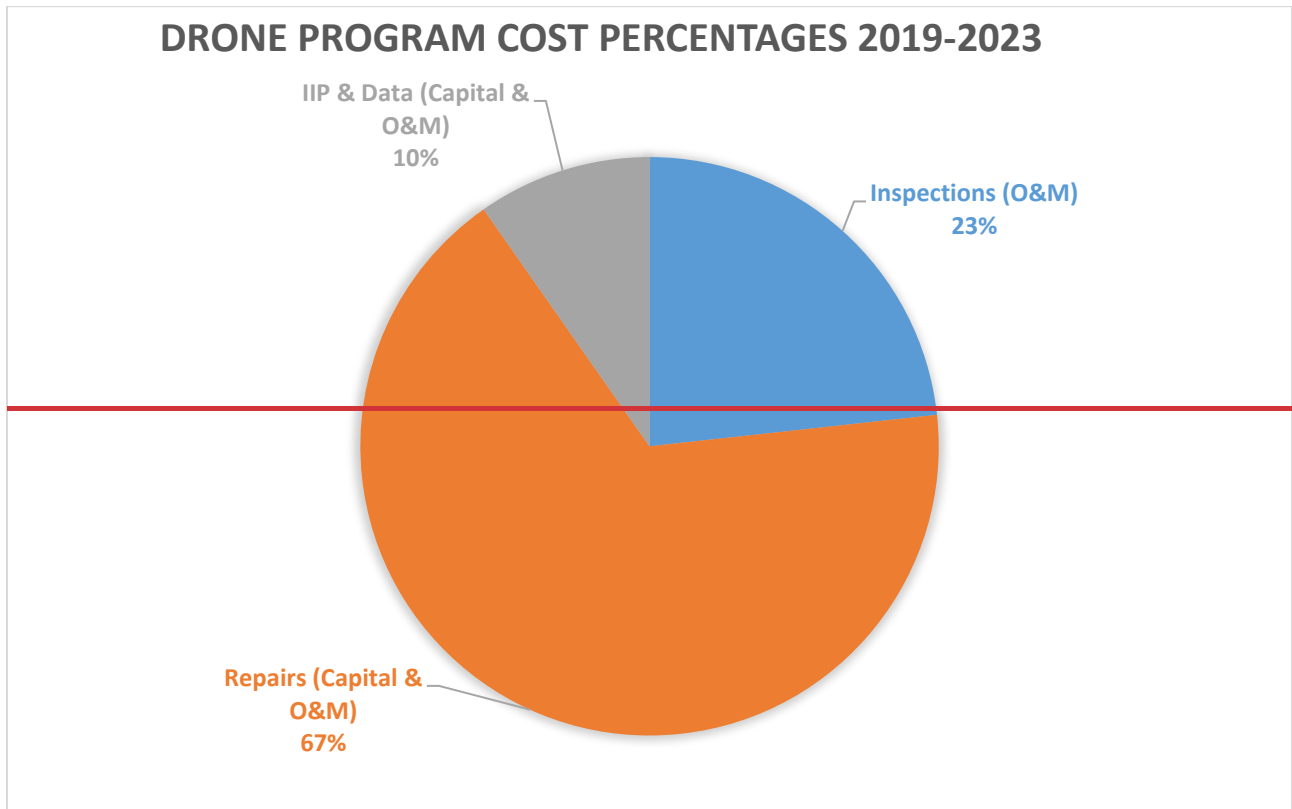
<sup>27</sup> AeroDeploy, Drone Inspection Cost vs Traditional Methods: Real Numbers from 10,000+ Inspections, available at <https://aerodeployuav.com/drone-inspection-cost-vs-traditional/>.

1 A. Yes. Costs of repairs arising from these programs were reported in SDG&E's WMPs as  
2 well as its Track 2 and Track 3 requests.

3 **Q. What portion of the costs are attributable to repairs?**

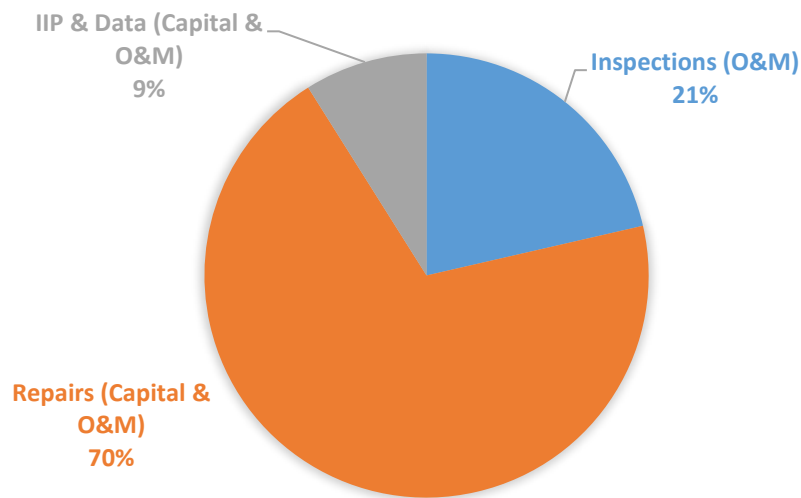
4 A. Approximately ~~67~~70% of the capital and O&M costs are contributable to repairs as  
5 shown in the figure below.

6 **Figure JK- 11: Total Drone Program Cost Percentages**



7

## DRONE PROGRAM TOTAL DIRECT COST BREAKDOWN 2019-2023

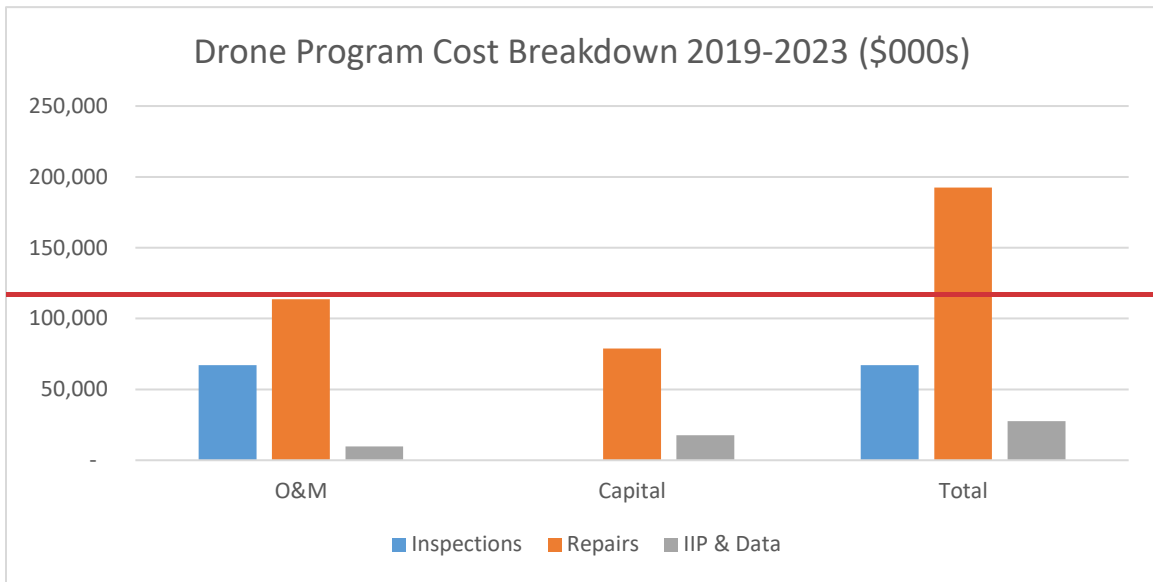


1  
2  
3 **Q. Provide a breakdown of costs included in this program between inspections, repairs**  
4 **and Artificial Intelligence/Data.**

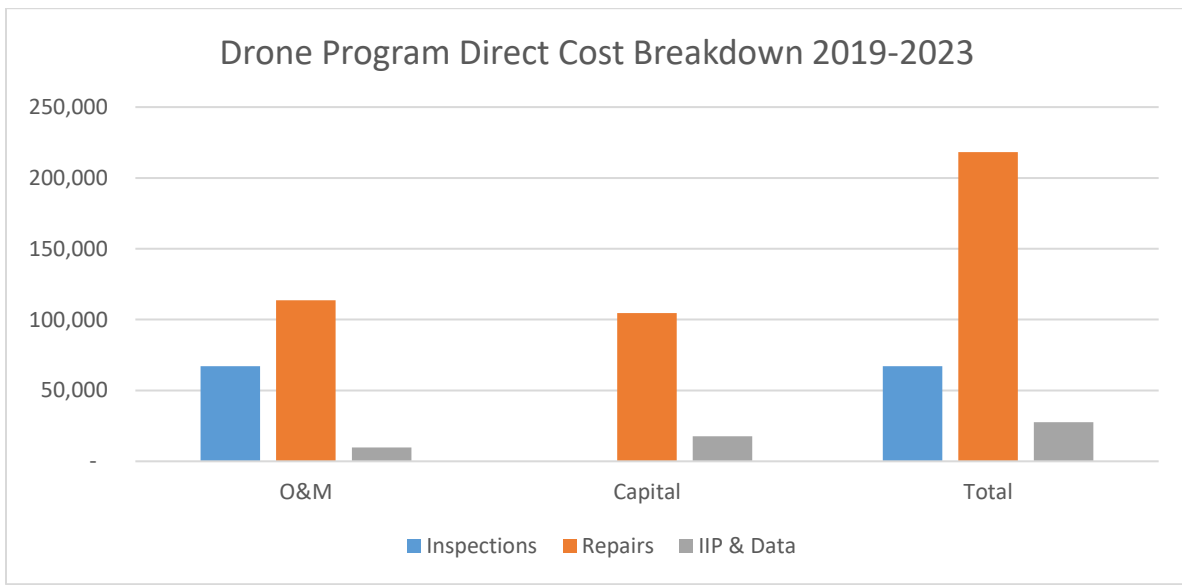
5 A. This Program includes O&M costs to perform image capture and inspections, develop the  
6 technology and software needed to perform and manage the work and data and costs to perform  
7 the O&M repairs associated with infractions found during these inspections. The Program also  
8 includes capital costs to develop the technology and software needed to perform and manage the  
9 work, develop the Machine Learning models and perform the capital repair work associated with  
10 infractions found during these inspections. The development of Machine Learning models to  
11 perform asset identification and damage detection are part of our IIP work. Accordingly, I  
12 collectively refer to the technology components of the drone program below as “IIP & Data.”  
13 The chart below provides a breakdown of the O&M and Capital costs between these three main  
14 categories: Inspections, Repairs and IIP & Data.

1

**Figure JK- ~~1212~~: Breakdown of Total Drone Program Costs**



2



3

4 Additional cost details can be found in the Drone assessments workpapers found in Exhibit  
5 SDG&E-T3-WPMA-07-E submitted with this testimony.

6 **Q. Describe the repairs that have occurred as a result of these programs?**

7 A. The chart below provides a high-level illustration of the different categories of repairs we  
8 tracked as part of the drone program. These categories represent the type of resolution for the  
9 condition identified rather than the condition itself. For example, emergency repairs included a

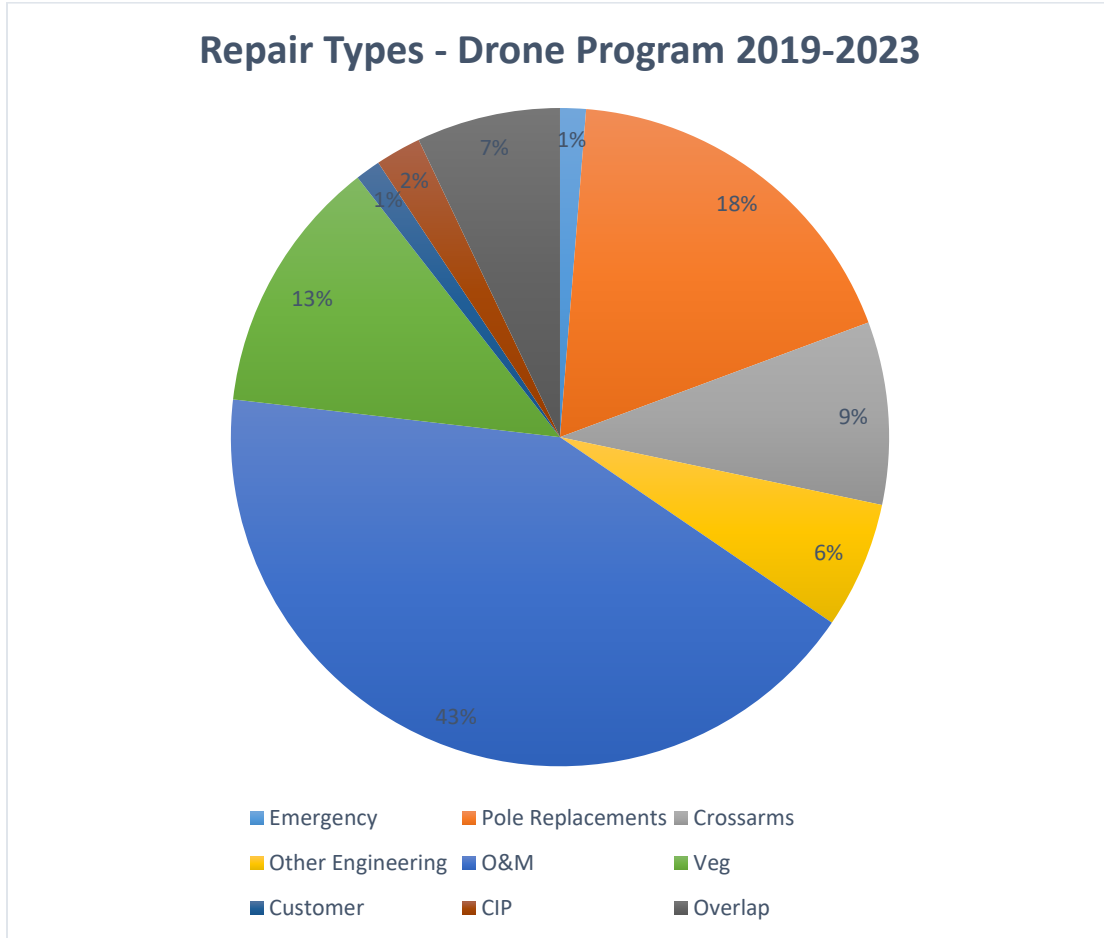
1 variety of issue types, but all posed an imminent threat of impact to safety, including fire. Other  
2 engineering represented issues that required pole loading analysis and design work, but did not  
3 require a pole replacement, such as installation of a new guy or anchor or transformer  
4 replacement. O&M repairs were generally minor repairs that did not require a pole loading  
5 analysis such as replacing chipped or damaged insulators, loose or missing hardware, or slack  
6 guy wires. CIP or Communication Infrastructure Provider repairs were related to issues with  
7 third party communications attachments that required notification to the attaching company and  
8 coordination on resolution of the repair. Similarly, customer repairs were related to customer  
9 owned equipment that required some type of remediation, such as a bent riser, missing insulation  
10 on the customer's service connection, or damaged electrical panel. Customer repairs also  
11 required notification and coordination with the customer to resolve, which was also included in  
12 the repair costs program. Finally, overlap repairs were those that affected poles in scope with  
13 another program. As discussed earlier, we coordinated with those other project teams to reduce  
14 duplication and redundancy of work as described in more detail below.

15 ///

16 ///

17 ///

**Figure JK-13: Drone Program Repair Types**



2

3

Overall the top 10 issue categories (not in order of volume) were:

4

1. Damaged arrestor, insulator, armor rod or other pole top work

5

2. Damaged pole

6

3. Damaged crossarm

7

4. Damaged conductor or equipment grounding

8

5. Vegetation clearance issue

9

6. Exposed connection

10

7. Loose communications attachment

11

8. Loose or missing hardware

12

9. Damaged, missing or loose guy or anchor

13

10. Improper splice

14

**Q. Are repairs consolidated with this or any other construction/maintenance program?**

1 A. Yes, we reviewed all DIAR and RIDI repair work for overlap with traditional inspection  
2 findings and other construction and maintenance projects and programs, such as traditional  
3 corrective maintenance repairs, Strategic Undergrounding, Covered Conductor, expulsion fuse  
4 replacements, hot line clamp replacements, and other projects/programs. That is also represented  
5 in the figure above under “Overlap.” Repairs and replacements were coordinated with other  
6 project teams to identify repair efforts on poles either led through the DIAR project or performed  
7 through the scope of the other project. If the latter was selected, the other Project would take the  
8 lead to complete the repair or scope of DIAR, or each program would be required to continue  
9 with their own scope. For example, if DIAR identified the need to replace a broken insulator, but  
10 SDG&E also intended to replace the pole and infrastructure through planned covered conductor  
11 installation, the covered conductor project would incorporate and satisfy the scope of the DIAR  
12 work.

13 Overall DIAR identified approximately 2,200 overlapping poles with other programs and  
14 coordinated the repair to either be handled by DIAR or the other program, achieving cost  
15 efficiencies with drone repairs and other project and program costs.

16 **Q. Are there requirements that SDG&E perform these repairs?**

17 A. Yes. “To ensure safe operations and the reduction of wildfire risk, Energy Safety expects  
18 that Electrical Corporations maintain electrical lines and equipment through: (1) thorough  
19 inspection of those lines and equipment to identify conditions that increase wildfire risk, and  
20 (2) expedient remediation of conditions identified during inspections to reduce known

1 wildfire risks. Unresolved conditions leave known wildfire risk on the system.”<sup>28</sup> Further, in  
2 2020, Energy Safety noted the requirements that SDG&E repair Level 1 conditions immediately,  
3 and found that, overall, “SDG&E took action to resolve and remedy actions in a timely  
4 manner.”<sup>29</sup>

5 Further, SDG&E was required to repair facilities identified as having potential violations  
6 of General Orders and other requirements. While SDG&E’s drone program was in addition to its  
7 auditable maintenance program as described in GO 95, Rule 18B; Rule 18A states that electric  
8 utilities are responsible for taking appropriate corrective action to remedy potential violations of  
9 GO 95 and safety hazards posed by their facilities.

10 **Q. Please provide the average costs for capital and O&M repairs for the Drone**  
11 **program versus other CMP repairs.**

12 A. Below is a comparison of the total cost and cost per unit for repairs performed as part of  
13 DIAR versus repair costs resulting from other inspection program findings. But as explained in  
14 more detail below, the direct cost comparison between repairs arising from SDG&E’s drone  
15 inspection programs and repairs arising from other AM&I programs is not “apples to apples,”  
16 because the costs related to CMP repairs do not include costs related to engineering, design,  
17 permitting, and environmental reviews, which are pooled and separately recorded to SDG&E’s  
18 authorized overhead pools accounts. These activities can be significant cost drivers depending on  
19 the nature of a project. Engineering, design, permitting and environmental costs incurred to make

---

<sup>28</sup> OEIS’s Annual Report on Compliance of SDG&E’s 2020 WMP (January 2023) at 54-55, available at <https://energysafety.ca.gov/news/2023/01/10/energy-safety-issues-final-annual-report-on-compliance-for-san-diego-gas-electrics-approved-2020-wildfire-mitigation-plan/>.

<sup>29</sup> *Id.* at 67.

repairs arising from drone inspections were directly charged to the program and are included in the table below.

**Table JK- ~~88:9~~: Capital Repair Cost Comparison**

	2019	2020	2021	2022	2023	Total
<b>Total Drone Capital Repair Costs (\$000s)</b>	274	12,962	8,550	25,589	<del>31,472</del> 57,157	<del>78,847</del> 104,532
Cost/Unit	\$34,204	\$39,398	\$25,221	\$57,119	<del>\$17,621</del> 32,003	<del>\$27,095</del> 35,921
<b>Total CMP Capital Repair Costs (\$000s)</b>	12,727	12,431	16,835	15,621	10,837	<b>68,451</b>
Cost/Unit	\$16,857	\$18,254	\$23,061	\$24,757	\$23,058	<b>\$20,952</b>

**Table JK- ~~99:10~~: O&M Repair Cost Comparison**

	2019	2020	2021	2022	2023	Total
<b>Total Drone O&amp;M Repair Costs</b>	77	27,756	10,564	30,677	44,584	113,658
Cost/Unit	\$1,185	\$6,651	\$3,961	\$7,710	\$6,160	\$6,271
<b>Total CMP O&amp;M Repair Costs</b>	0	22	744	381	454	1,601
Cost/Unit	N/A	\$4,473	\$7,666	\$3,003	\$5,535	<b>\$5,148</b>

**Q. Why are the capital unit costs higher for drone repairs than repairs identified from other inspection efforts?**

A. There are multiple factors that contributed to the higher capital unit costs for DIAR than other corrective maintenance repairs.

First, many of these costs were subject to significant inflationary pressures due to the economic conditions and supply chain limitations present during the COVID-19 pandemic and a period of record inflation from 2020-2023.

Additionally, DIAR engineering costs were charged directly to the program. Costs recorded to other corrective maintenance repair programs are recorded to SDG&E's authorized

1 engineering overhead pools. As a result, the engineering costs associated specifically with DIAR  
2 serve to inflate the unit costs for comparison purposes, because they are considered a direct cost  
3 while the other programs' engineering costs are included within the indirect costs and thus not  
4 included in the per unit calculation.

5 Further, while both the DIAR program and other CMP inspections performed pole  
6 replacements in the HFTD, the repair processes differed materially during the 2019–2022 period  
7 due to the maturity of the programs, the volume of the findings, and how the work was managed  
8 and executed. When the DIAR program started, inspections were planned, scheduled and  
9 performed outside of SDG&E's scheduling and inspection enterprise systems, and the findings  
10 were not integrated into SDG&E work management systems. While SDG&E did explore a  
11 manual process to create notifications or work orders resulting from the drone inspections, the  
12 volume of findings were much greater than internal resources could manage at the time, both  
13 from a design, engineering and construction perspective.

14 Accordingly, to avoid delays in addressing or repairing findings (which could result in an  
15 ignition or safety event), reduce the risk of non-compliance with other General Order and  
16 applicable requirements, and promote safe and reliable operations through reduced PSPS  
17 impacts, SDG&E elected to manage the repair work outside of existing work management  
18 systems and assign external resources to manage the work and engineer and design the repairs  
19 and execute the construction work needed to complete the repair/pole replacement. So, where  
20 smaller O&M repairs were able to maintain a similar unit cost to our traditional CMP repair  
21 work, the more complex capital repairs, primarily pole replacements, resulted in approximately  
22 2342% higher costs from 2019-2023 due to the reasons stated above and the need to develop new  
23 work processes, engage external resources, and provide necessary additional oversight and

1 management. For repairs resulting from the RIDI program beginning in 2023, we integrated the  
2 repairs into traditional work management systems and were able to realize a decrease in unit  
3 costs between DIAR and RIDI by managing the repairs with other CMP inspection findings and  
4 performing more of the RIDI repair work in house (both engineering and construction).

5 Finally, due to the volume of repair work, there can be a delay between when repair work  
6 begins and when it is completed, which can result in fluctuations in when costs are incurred. For  
7 example, between 2022 and 2023, much of the preparation costs for pole replacements  
8 completed in 2023 were incurred in 2022.

9 **Q. Were these costs forecasted or authorized in SDG&E's prior GRC?**

10 A. No. SDG&E's DIAR and RIDI programs were developed after SDG&E submitted its  
11 Test Year 2019 GRC testimony and no associated costs were authorized in D.19-09-051.

12 **Q. Are there any particular cost drivers that resulted in increases over authorized?**

13 A. The drone program was added to SDG&E's AM&I programs to address wildfire risk  
14 after the enactment of SB 901 and AB 1054 and supplemented SDG&E's existing inspection  
15 programs. Accordingly, the drone inspection and repair costs were not included in SDG&E's  
16 prior GRC and were therefore not included in the authorized funds. As stated earlier in my  
17 testimony, ~~67~~70% of the drone program costs from 2019-2023 are related to repairing potential  
18 fire and safety hazards identified during drone inspections. The number and severity of  
19 conditions identified, and repairs needed were not contemplated and far exceeded any costs  
20 associated with other overhead electric distribution repair programs.

21 **Q. Please describe any relevant feedback on this program from the Office of Energy**  
22 **Infrastructure Safety.**

1 A. Energy Safety has consistently praised SDG&E’s use of drones to inspect infrastructure  
2 and implement technologies such as Machine Learning to improve inspection methodologies.<sup>30</sup>  
3 In fact, Energy Safety has challenged other utilities, such as PG&E, to further expand the use of  
4 drone technology to aid inspections, taking action to require PG&E to provide additional  
5 reporting on drone inspection pilots because it was “using drones in a limited capacity.”<sup>31</sup>

6 OEIS approved SDG&E’s 2021 WMP Update and within “areas of significant progress,”  
7 OEIS explicitly recognized SDG&E’s use of drones to augment existing inspection programs as  
8 part of its maturation and innovation in wildfire mitigation.<sup>32</sup> Additionally, in the Final Decision  
9 on SDG&E’s 2022 Wildfire Mitigation Plan Update, OEIS noted SDG&E’s progress in  
10 inspection technologies, including drones, and cited strong find rates and improved visibility of  
11 pole-top and equipment conditions as part of SDG&E’s wildfire-risk reduction strategy.<sup>33</sup>

12 Additionally, the Independent Evaluator (IE) for SDG&E’s 2021 WMP found drone  
13 imagery effective in significantly the volume of initiatives that could be verified, including grid  
14 hardening, weather stations, and fuels management.<sup>34</sup> The IE positively noted the robustness of  
15 SDG&E’s program and the quality of images, as well as the breadth of possible uses for the

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<sup>30</sup> See n.11, *supra*.

<sup>31</sup> PG&E 2023-2025 WMP R8 (February 13, 2025) at 1075, ACI PG&E-22-20.

<sup>32</sup> OEIS’s Evaluation of SDG&E’s 2021 Wildfire Mitigation Plan Update (Final Action Statement, July 2021) available at [https://energysafety.ca.gov/wp-content/uploads/tn10257\\_20210720t164339\\_revised\\_final\\_action\\_statement\\_on\\_san\\_diego\\_gas\\_ele ctr.pdf](https://energysafety.ca.gov/wp-content/uploads/tn10257_20210720t164339_revised_final_action_statement_on_san_diego_gas_ele ctr.pdf).

<sup>33</sup> OEIS’s Final Decision of SDG&E’s 2022 WMP Update (July 2022) at 18 (“SDG&E’s Drone Investigation, Assessment and Repair (DIAR) Program was effective at detecting issues. This led to a 62 percent reduction in issues found in subsequent Corrective Maintenance Program inspections in 2021 in the Tier 3 HFTD, even with a 20 percent increase in distribution pole inspections.”).

<sup>34</sup> Final Independent Evaluator Report on Compliance for SDG&E’s 2022 WMP (June 30, 2022), available at <https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=52688&shareable=true>

1 imagery,<sup>35</sup> concluding “[t]he applications of these models are many. From advance warning  
2 concerning any assets at risk due to topological changes (earthquakes/ settling; mudslides;  
3 subsidence) to routine flights that monitor vegetation clearances around any of these assets. By  
4 continuing to build its imagery library, *SDG&E is investing in an asset that can pay dividends in*  
5 *operational and safety efficiencies for years to come.*”<sup>36</sup> The IE further noted that it was  
6 “encouraged by the innovative approach SDG&E is undertaking in partnership with other private  
7 entities and academia in the realm of Artificial Intelligence and Machine Learning.”<sup>37</sup>

8         Formal critical feedback on drone inspection scope or targets only occurred in 2024 and  
9 2025, when OEIS scrutinized SDG&E’s proposal to reduce the number of drone inspections  
10 performed annually. Noting the effectiveness of drone inspections at reducing wildfire risk, in  
11 2025, OEIS expressly denied SDG&E’s request to reduce the number of WMP.552 Drone  
12 Assessments<sup>38</sup> from 13,500 to 6,500, stating that SDG&E did not show good cause and  
13 emphasizing that SDG&E’s find rate for drone inspections was considerably greater than its find  
14 rate for detailed inspections, so the proposed reduction would likely leave risk unidentified.<sup>39</sup>

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<sup>35</sup> *Id.* at 88. The robustness and consequent usefulness of the tools described below is dependent upon the depth of imagery available. With sufficient imagery and following “orthorectification” (a process by which images are converted into data usable for mapping), the resulting models can enable the capture, storage, and reference of additional details useful for multiple purposes.

<sup>36</sup> *Id.* at 90 (emphasis added).

<sup>37</sup> *Id.*

<sup>38</sup> OEIS’s Decision for SDG&E’s 2025 Petition to Amend to its 2023–2025 Base WMP (July 11, 2025) at 7, available at <https://efiling.energysafety.ca.gov/EFiling%5CGetPublicDocument.aspx?documentId=58911>.

<sup>39</sup> *Id.*

1 OEIS specifically stated that “SDG&E should *increase* the targets to avoid level 2 conditions  
2 remaining unidentified and uncorrected in the HFTD by other inspection types.”<sup>40</sup>

3 **Q. Has SDG&E reviewed any information on similar programs at peer utilities?**

4 A. Yes. Through early and sustained benchmarking and collaboration, SDG&E worked to  
5 share lessons learned and align its drone programs with peer utilities. When SDG&E started the  
6 DIAR program, it was the only California IOU to utilize drones for inspections on distribution  
7 facilities; our distribution drone inspection program materially advanced the development of  
8 similar programs at PG&E and SCE, reducing their need to independently design, test, and refine  
9 inspection methodologies for electric distribution facilities.

10 In August 2019, SDG&E reached out to SCE and PG&E when initiating our distribution  
11 drone inspections. As part of those communications, PG&E and SCE shared data capture  
12 requirements, inspection process and safety measures. PG&E and SCE shared this information  
13 for transmission drone inspections, as my understanding is that they did not have distribution  
14 drone inspection programs at the time. All three companies also began participating in  
15 Unmanned Aerial Vehicle (UAV) monthly operations check-ins to discuss any incidents and  
16 lessons learned. We also reached out to several drone vendors that also provided services to  
17 PG&E and SCE to learn more about implementing a drone program, including the type of  
18 aircraft and cameras used, to flight planning, lessons learned, flight safety considerations, etc.

19 Periodic benchmarking and touch points continued in 2020 and 2021, sometimes  
20 focusing on permitting issues, such as obtaining approvals to perform drone flights on state park

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<sup>40</sup> OEIS’s Rejection and Order to Resubmit for SDGE 2026-28 Base WMP (June 24, 2025) at 6  
(emphasis added), available at  
<https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=58774&shareable=true>.

1 lands or reviewing program status. In 2021, SDG&E and SCE participated in a multi-day  
2 collaboration meeting that included field visits to demonstrate drone operations performed with a  
3 QEW and office meetings to review all aspects of the execution of our drone program. By  
4 sharing practical lessons learned on data capture standards, safety protocols, flight planning,  
5 permitting, and field execution, SDG&E helped peer utilities avoid duplicative trial-and-error  
6 and accelerate their program deployment. SDG&E's field demonstrations and end-to-end  
7 program walkthroughs directly informed changes to SCE's inspection approach, including  
8 adoption of a combined ground-inspector-and-pilot "360 inspection" model.

9 In 2022, while SDG&E was completing drone inspections of all of its electric distribution  
10 assets in the HFTD and higher risk WUI areas, SDG&E participated in additional benchmarking  
11 meetings with PG&E as they prepared to start distribution drone inspections. In addition, more  
12 focused discussions with SCE and PG&E related to implementing a risk-informed inspection  
13 approach began.

14 Since 2022, SDG&E continues to benchmark practices with PG&E and SCE on a  
15 quarterly basis and has expanded collaboration efforts to include other utilities across the United  
16 States, including Hawaii, and internationally with Australia as they face similar challenges with  
17 wildfire.

18 SDG&E has also leveraged information developed during the drone inspection process to  
19 inform regulatory developments. For instance, SDG&E participated in Office of Energy  
20 Infrastructure Safety workshops held in 2023 to discuss changes to GO 165 inspection  
21 requirements to potentially require the use of drones for inspections or adopt a more risk-  
22 informed strategy versus time-based approach. These recommendations were intended to be  
23 brought to the CPUC through the Climate Adaptation OIR (R.18-04-019).

1 Finally, SDG&E initiated a joint Machine Learning model study with SCE and PG&E,  
2 which included sharing of images of distribution poles to test models and provide damage and  
3 asset predictions for analysis by SCE and PG&E. The intent of this study was to determine  
4 whether SDG&E's developed Machine Learning models would be effective on imagery acquired  
5 by the other utilities and on their assets, and to evaluate whether model sharing would be  
6 valuable to the other utilities. SDG&E's experience with risk-informed inspections and  
7 machine-learning-enabled image analysis supported shortened development timelines, improved  
8 inspection effectiveness, and reduce overall implementation costs.

9 By pioneering large-scale drone inspections and associated AI capabilities for electric  
10 distribution facilities, SDG&E effectively blazed a trail that peer utilities were able to follow,  
11 improving their programs while saving time, resources, and development expense that would  
12 otherwise have been borne by their ratepayers.

13 **Q. Please provide any cost comparisons between SDG&E, PG&E and SCE's drone**  
14 **inspections from 2019-2022.**

15 A. Cost comparisons for electric distribution drone inspections from 2019-2023 are  
16 challenging because of significant variations in the scope of the programs implemented by each  
17 utility and the timing of when each utility implemented distribution drone inspection programs.  
18 SCE did not begin distribution drone inspections until 2021, and PG&E only implemented a pilot  
19 program for distribution inspections using drones in 2022. Given these variations, it is not  
20 reasonable to compare costs on a per-structure basis for a given year.

21 **Q. Please provide any cost comparisons between SDG&E, PG&E and SCE's repair**  
22 **work 2019-2022.**

1 A. There is no publicly available information to make an informed comparison of repair  
2 costs resulting from drone inspections, in part due to the program variances in scope and timing  
3 discussed above.

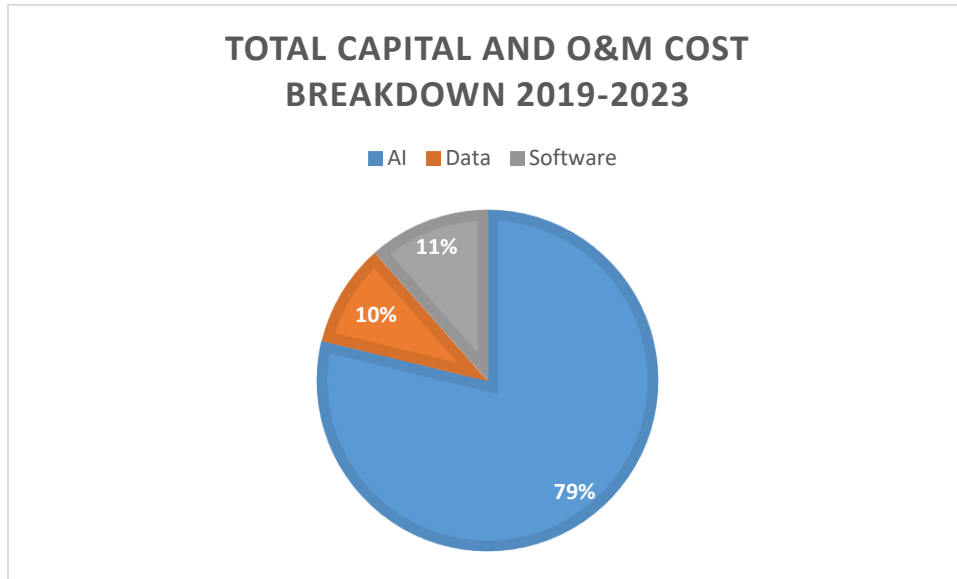
4 **Q. Provide a breakdown of SDG&E's costs on IIP and Data between O&M and**  
5 **Capital and on data management versus AI for 2019-2023.**

6 A. Below is a breakdown of SDG&E's costs for work from 2019-2023 related to Machine  
7 Learning model development, software and data management. Please note that data management  
8 costs are embedded in some of the inspection and repair costs, since personnel involved in those  
9 work streams also were responsible for data accuracy and reporting.

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**Table JK- ~~101011~~: Breakdown of Technology Costs for DIAR and RIDI from 2019-2023 (\$000)**

	Capital (\$000s)	O&M (\$000s)	Total(\$000s)
<b>IIP/ML (AI)</b>	\$15,326	\$6,390	\$21,716
<b>Data</b>	\$1,479	\$1,201	\$2,681
<b>Software</b>	\$903	\$2,268	\$3,172
<b>Total</b>	\$17,709	\$9,859	\$27,568



Note that the costs to develop the Machine Learning models from 2019-2023 will provide sustained value because they are reusable enterprise assets that continue to be applied across new inspection cycles and programs. As new imagery is collected, the same models are reused and improved, increasing accuracy and expanding coverage over time rather than requiring redevelopment. This allows SDG&E to realize compounding safety, operational, and cost-efficiency benefits well beyond the initial investment.

**Q. Besides the identification and repair of damages identified through drone inspections, what other benefits were realized because of the drone program?**

1 A. While identifying and repairing damage was the primary objective of DIAR and now  
2 with RIDI, the programs delivered multiple additional operational, analytical, and strategic  
3 benefits that extended well beyond individual inspection and repair outcomes.

4 First, DIAR significantly improved SDG&E's system-wide situational awareness in the  
5 HFTD by providing a baseline visibility of all distribution overhead facilities, particularly  
6 pole-top components that are difficult to assess from the ground. This enhanced visibility  
7 allowed SDG&E to better understand where wildfire risk was concentrated and to refine its  
8 wildfire-mitigation strategy accordingly.

9 Next, DIAR provided SDG&E with a benchmark against its traditional ground-based  
10 inspection program (CMP), which helped to identify gaps in what ground inspections were  
11 identifying, and asset conditions that warranted changes to inspection practices or prioritization.

12 DIAR also generated a large, structured dataset of labeled imagery and inspection results  
13 that had not previously existed at SDG&E. That dataset created a historical record of asset  
14 condition in Tier 3 and Tier 2 HFTD areas and supported analysis of asset degradation and repair  
15 effectiveness. With the availability of high-resolution imagery, this dataset is trusted and remains  
16 valuable even after the inspections themselves were completed.

17 One of the most significant secondary benefits of DIAR and RIDI was that it provided  
18 the data needed to develop IIP. DIAR imagery reviewed by QEWs was used to train and validate  
19 machine-learning models, test whether automated asset and damage detection was feasible, and  
20 establish a human-in-the-loop inspection framework. DIAR is the origin point for SDG&E's  
21 AI-enabled inspection capabilities that will continue to benefit SDG&E and its customers well  
22 into the future. While financial benefits of ML capabilities have already been realized, the ML

1 development costs are upfront, while benefits recur and grow as models are reused and  
2 improved.

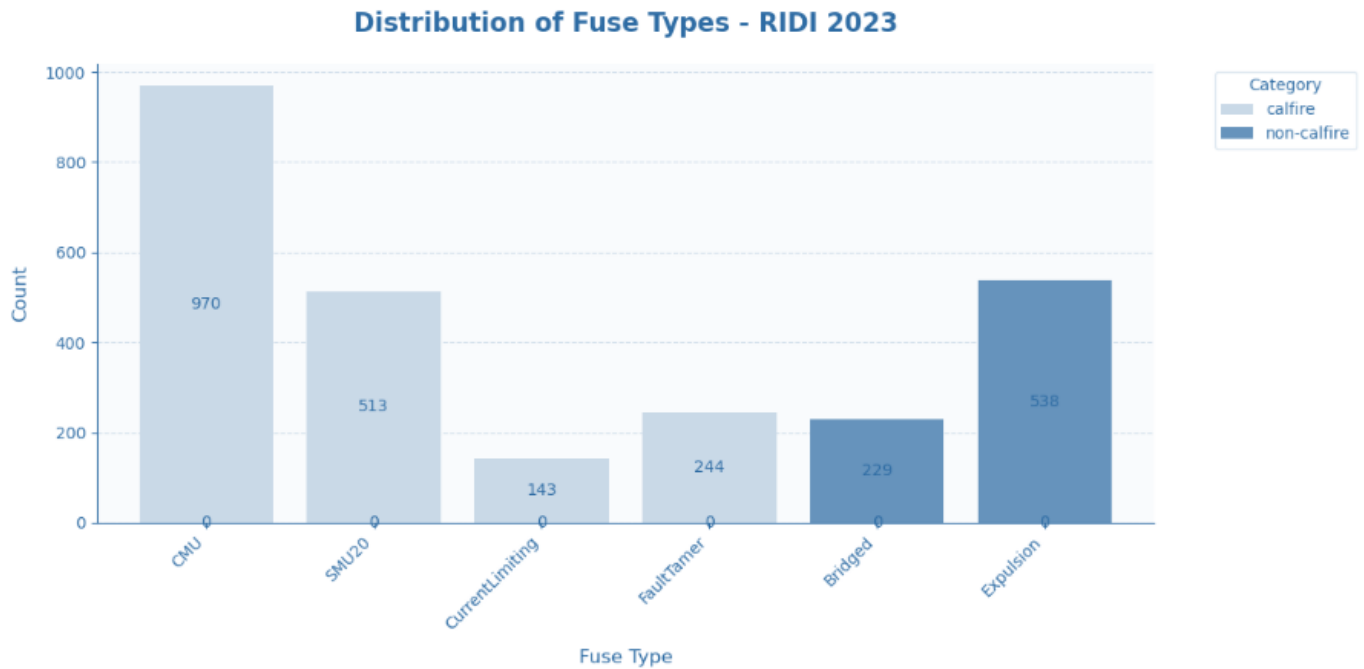
3 Imagery from DIAR and RIDI created the ability to not only identify damages, but also  
4 catalog assets that help SDG&E mitigate wildfire risk. For example, imagery from these  
5 programs helped us identify approximately 800 non-CALFIRE approved fuses for replacement.  
6 CALFIRE’s Power Line Fire Prevention Field Guide<sup>41</sup> evaluates equipment based on whether it  
7 can produce heat, sparks, molten material, or flaming debris during normal operation or fault  
8 clearing. A non-CALFIRE fuse, such as an expulsion fuse, ejects burning fuse elements that can  
9 drop to the ground during normal operation. Under dry or windy conditions, that fuse material  
10 can cause a catastrophic ignition event. Equipment that does not meet those ignition-prevention  
11 criteria is considered non-exempt and presents a high-risk in fire-threat areas; presence of this  
12 equipment on infrastructure also triggers additional compliance requirements regarding  
13 vegetation management and other programs.

14 SDG&E’s 2023 WMP discussed how installation of CALFIRE approved fuses are  
15 considered highly effective at risk reduction, and expulsion fuse replacement was a component  
16 of SDG&E’s approved WMPs.<sup>42</sup> Therefore, identifying where these fuses are and replacing them  
17 with alternative CALFIRE fuses helps mitigate wildfire risk. Leveraging DIAR and RIDI  
18 inspections to aid in identifying the location of non-CALFIRE fuses promoted efficiencies and  
19 resulted in savings versus manual field visits to create an inventory of non-CALFIRE fuses on  
20 infrastructure.

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<sup>41</sup> See [California Powerline Equipment Identification Pocket Guide](#).

<sup>42</sup> SDG&E’s 2023-2025 Base WMP (October 23, 2023) at 222-223.

**Figure JK- 134: RIDI 2023 Fuse Types**

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Other examples of realized value added related to the Machine Learning models

4

developed through DIAR and RIDI include:

5

- Poles without Avian Protection (HFTD): IIP produced pole-level detections identifying poles lacking Avian Protection devices in the HFTD and provided these lists to electric engineering to support WMP compliance and asset replacement scoping. Avian protection devices are important in wildfire mitigation to help prevent bird contact with electrical lines and equipment that become an ignition source.

10

11

- Porcelain arresters: IIP deployed porcelain-specific arrester detection models and identified approximately 2,500 porcelain arresters in Tier 3 that allowed engineering to expedite arrester replacements and reduce costs associated with fielding similar to the non-CalFire fuses described in detail above. Porcelain arrestors also present a potential ignition source since they can produce heat, sparks or molten material during failure.

16

17

- Third-party attachment recovery: IIP models have identified unauthorized attachments, supporting recovery of unpaid recurring attachment fee revenue.

18

1 The scale of DIAR also functioned as a reasonable sample to test existing processes,  
2 which exposed and allowed us to remedy bottlenecks and inefficiencies across inspection,  
3 engineering, permitting, and construction. By addressing system issues, pinch points in  
4 contractor coordination and repair execution, and simplification of workflow design, improved  
5 resource allocation, and data handoffs, we were able to realize cost reductions benefiting our  
6 customers not just related to DIAR and RIDI over the 2019-2023 period, but associated with  
7 other SDG&E projects and programs.

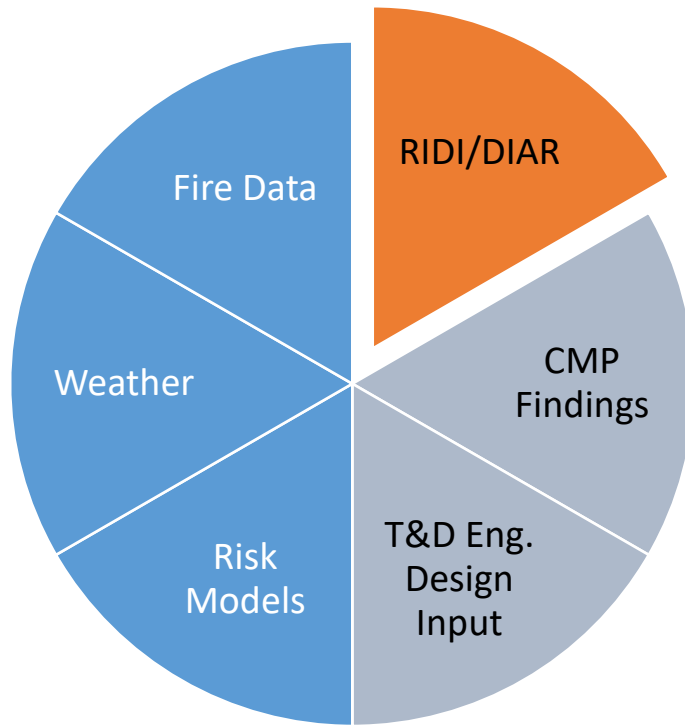
8 DIAR also helped SDG&E improve customer interactions and worker safety by  
9 improving access protocol data (*e.g.*, gate codes and contact information) for customers across  
10 the HFTD. This data supports more efficient, safer and customer-focused operations across the  
11 Company.

12 Finally, the experience SDG&E gained on DIAR helped normalize and operationalize  
13 drone usage across the organization; this work has enabled the company to use drones for  
14 situational awareness during extreme fire weather and PSPS events, rapid visual confirmation of  
15 conditions following outages or incidents, support for asset management and compliance  
16 activities outside routine inspection cycles, obtaining beyond visual line of sight authorizations  
17 from the FAA, and perform stringing operations with drones rather than manpower, which  
18 promotes employee safety and can accelerate and re-energization timelines.

19 SDG&E's PSPS decision making is based on key information such as weather  
20 conditions, fire conditions, vegetation and fuels, and asset conditions. Asset health information  
21 obtained through the DIAR and RIDI programs is routinely used to determine the Alert Speeds  
22 or thresholds of wind speeds for when SDG&E shuts power off to a circuit segment. As part of  
23 SDG&E's WiNGS-Ops model—which supports PSPS decision making—SDG&E developed an

1 interactive dashboard to easily identify assets with open work orders that require lower de-  
2 energization wind gust thresholds. By addressing poles with open work orders, this approach  
3 could prevent the de-energization of hundreds of customers, enhancing the reliability and  
4 resilience of assets during extreme fire weather conditions.<sup>43</sup>

5 **Figure JK- 13:15: PSPS Decision-Making Data Inputs**



6 Over time, SDG&E’s drone program reached a level of maturity that delivered  
7 substantial operational value, particularly in enhancing situational awareness during periods of  
8 extreme fire weather when proactive de-energization through PSPS may have been required.  
9 Drone imagery played a critical role in identifying Temporary Construction and Compliance  
10

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<sup>43</sup> See SDG&E 2026-2028 WMP (September 30, 2025) at Appendix D-8.

1 (TCC) poles.<sup>44</sup> TCC poles represent structures with temporary configurations due to ongoing  
 2 construction, or compliance issues awaiting permanent repairs. Automated visibility of these  
 3 assets enabled SDG&E to prioritize repair and replacement activities throughout the year and,  
 4 critically, in the days leading up to potential de-energization events. In addition, this intelligence  
 5 supported dynamic adjustments to base alert wind speed thresholds for specific circuit segments  
 6 during PSPS events. This targeted, surgical approach provides a more precise and data-driven  
 7 understanding of asset conditions, empowering operational decisions that minimize customer  
 8 impacts while maintaining system safety and reliability.

9 The figure below shows how drone imagery is visually integrated into a unified WiNGS-  
 10 OPs platform, providing situational awareness and supporting informed PSPS de-energization  
 11 decisions:

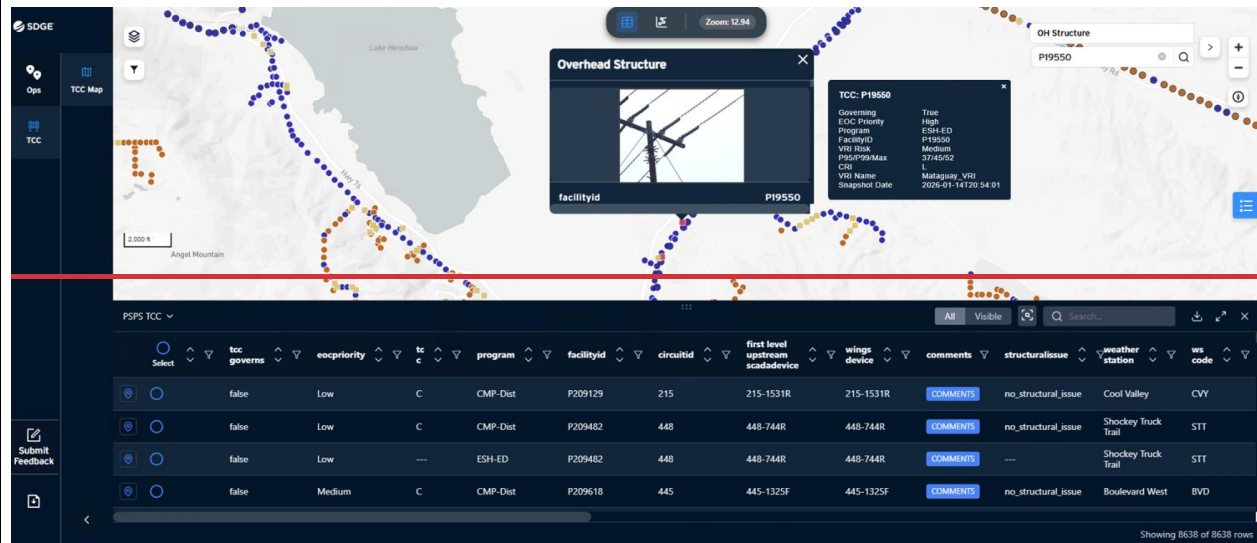


Figure JK- 14:16: WiNGS-Op TCC Viewer Screenshot

<sup>44</sup> See SDG&E 2026-2028 WMP (September 30, 2025) at 151-152.

1

The screenshot displays a utility management interface for SDGE. At the top, a map shows a network of overhead structures (OH Structures) in blue and orange dots, with a zoom level of 12.94. A pop-up window titled 'Overhead Structure' shows a photo of a power line tower and the facility ID 'P19550'. Another pop-up window provides details for 'TCC: P19550', including governing EOC, priority, program, facility ID, VRI risk, P19550 Max, CRI, VRI Name, and Snapshot Date.

Below the map is a data table with the following columns: **select**, **tcc governs**, **eoepriority**, **tcc**, **program**, **facilityid**, **circuitid**, **first level upstream scada device**, **wings device**, **comments**, **structuralissue**, **weather station**, and **ws code**.

select	tcc governs	eoepriority	tcc	program	facilityid	circuitid	first level upstream scada device	wings device	comments	structuralissue	weather station	ws code
<input type="radio"/>	false	Low	C	CMP-Dist	P209129	215	215-1531R	215-1531R	<a href="#">COMMENTS</a>	no_structural_issue	Cool Valley	CVY
<input type="radio"/>	false	Low	C	CMP-Dist	P209482	448	448-744R	448-744R	<a href="#">COMMENTS</a>	no_structural_issue	Shockey Truck Trail	STT
<input type="radio"/>	false	Low	---	ESH-ED	P209482	448	448-744R	448-744R	<a href="#">COMMENTS</a>	---	Shockey Truck Trail	STT
<input type="radio"/>	false	Medium	C	CMP-Dist	P209618	445	445-1325F	445-1325F	<a href="#">COMMENTS</a>	no_structural_issue	Boulevard West	BVD

At the bottom right of the table, it says 'Showing 8638 of 8638 rows'.

2

3 14

4 Q. DOES THIS CONCLUDE YOUR TESTIMONY?

5 A. Yes.

## **APPENDIX A**

### **DISTRIBUTION INSPECTION ANALYSIS REPORT**