PUBLIC UTILITIES COMMISSION OF THE STATE OF CALIFORNIA

Resolution WSD-005
Wildfire Safety Division
June 11, 2020

R E S O L U T I O N

RESOLUTION WSD-005 - Resolution Ratifying Action of the Wildfire Safety Division on San Diego Gas & Electric Company's 2020 Wildfire Mitigation Plan Pursuant to Public Utilities Code Section 8386.

This Resolution ratifies the attached action of the Wildfire Safety Division (WSD) pursuant to Public Utilities Code Section 8386. The California Public Utilities Commission's (Commission) and the WSD's most important responsibility is ensuring the safety of Californians. Since several catastrophic wildfires in the San Diego area in 2007, the equipment of large electric utilities the Commission regulates has been implicated in the most devastating wildfires in our state's history. California's Legislature enacted several legislative measures requiring electrical corporations to submit, and the Commission and the WSD to review, approve or otherwise act on Wildfire Mitigation Plans (WMPs) designed to reduce the risk of utility-caused catastrophic wildfire. Key among the legislative measures are Senate Bill 901 (2018), Assembly Bill 1054 (2019), and Assembly Bill 111, discussed in detail below.

This Resolution (along with several others concurrently being issued with regard to all Commission-regulated electric utilities and independent transmission owners), acts on the WMP submitted on February 7, 2020, of San Diego Gas & Electric Company (SDG&E, filer or electrical corporation), pursuant to Public Utilities Code section 8386.3(a). SDG&E's WMP responds to a list of 22

requirements set forth in Public Utilities Code 8386 and focuses on measures the electrical corporation will take over the next three years to reduce the risk of, and impact from, a catastrophic wildfire caused by its electrical infrastructure and equipment.
Electrical infrastructure and equipment pose ongoing risks of starting wildfires due to the presence of electric current. There are three elements required to start a fire: fuel (such as dry vegetation), oxygen, and an ignition source (heat). A spark from electrical infrastructure and equipment can provide the ignition point from which a wildfire can spread and cause catastrophic harm to life, property, and the environment.

WMPs contain an electrical corporation's detailed plans to reduce the risk of its equipment, operations or facilities igniting a wildfire. This Resolution ratifies the attached action of the WSD, which has conditionally approved SDG&E's 2020 WMP in its Action Statement. In doing so, this Resolution analyzes the extent to which SDG&E's wildfire mitigation efforts objectively reduce wildfire risk, drive improvement, and act as cost effectively as possible. In conducting this evaluation, the Commission considers and incorporates input from the Wildfire Safety Advisory Board, the public and other stakeholders.

PROPOSED OUTCOME:

- Ratifies the attached action of the WSD to approve the 2020 WMP of SDG&E, with conditions designed to ensure the WMP decreases risk of catastrophic wildfire in California.
- A list of conditions of approval is in Appendix A.
- Evaluates the maturity of SDG&E's WMP using the WSD's new Utility Wildfire Mitigation Assessment, as represented in the Utility Wildfire Mitigation Maturity Model. Final maturity model outputs should be viewed as levels or thresholds – they are not absolute scores.

- Requires SDG&E to file an update to its 2020 WMP in 2021 according to a forthcoming schedule to be released by the WSD.
- Does not approve costs attributable to WMPs, as statute requires electrical corporations to seek cost recovery and prove all expenditures are just and reasonable at a future time in their General Rate Cases (GRC). Nothing in this Resolution nor the WSD's Action Statement should be construed as approval of any WMP-related costs.
- Does not establish a defense to any enforcement action for a violation of a Commission decision, order, or rule.

SAFETY CONSIDERATIONS:

Mitigation of catastrophic wildfires in California is among the most important safety challenges the Commission-regulated electrical corporations face. Comprehensive WMPs are essential to safety because:

- WMPs list all of an electrical corporation's proposed actions to reduce utility-related wildfire risk and prevent catastrophic wildfires caused by utility infrastructure and equipment. By implementing measures such as vegetation management, system hardening (such as insulating overhead lines and removing or upgrading equipment most likely to cause fire ignition), improving inspection and maintenance, situational awareness (cameras, weather stations, and use of data to predict areas of highest fire threat), improving community engagement and awareness, and other measures, utility-caused catastrophic wildfire risk should be reduced over time.
- The WSD's and Commission's substantive and procedural changes for evaluations of electrical corporations' 2020 WMPs will enhance California's ability to mitigate catastrophic wildfire risk related to utilities. Below is a summary of the key, new requirements in the 2020 process, required of all WMP filers:

- A WMP template and format so WMPs are standardized and include similar information in the same format.
- Standard data submissions, in spatial, non-spatial and tabular format, which grounds the WMPs in specific data. Data submissions will continue throughout the WMP 3-year horizon and be used to measure compliance and performance to program, progress and outcome metrics.
- A new Utility Survey that objectively assesses the electrical corporation's maturity across 52 capabilities in 10 categories. The resulting Maturity Matrix quantitatively presents the progressive impact of the electrical corporation's wildfire mitigation plan activities over the WMP 3-year horizon.

ESTIMATED COST:

- Nothing in this Resolution should be construed as approval of the costs associated with the WMP mitigation efforts.
- For illustrative purposes, Table 1 below contains filer's estimates of its projected costs for the wildfire mitigation efforts in its 2020 WMP.
- SDG&E may not record the same costs more than once or in more than one place, seek duplicative recovery of costs, or record or seek to recover costs in the memorandum account already recovered separately. All electrical corporations should ensure they carefully document their expenditures in these memorandum accounts, by category, and be prepared for Commission review and audit of the accounts at any time.

Table 1: Proposed WMP costs

Proposed WMP costs	
Total costs 2020-2022	$1.34 billion
Subtotal: 2020	$444 million
Subtotal: 2021	$445 million
Subtotal: 2022	$448 million

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Summary

This Resolution acts on the attached Wildfire Safety Division's (WSD) conditional approval of Wildfire Mitigation Plan (WMP) submitted by San Diego Gas & Electric Company (SDG&E) on February 7, 2020. The Resolution finds that SDG&E is in compliance, subject to conditions, with the requirements for WMPs set forth in Assembly Bill (AB) 1054, codified at Public Utilities Code (Pub. Util. Code) Section 8386(c) and the WMP Guidelines issued by the Commission to electrical corporations. Section 8386 requires that electrical corporations' WMPs contain 22 elements; the full list of elements appears in Appendix E to this Resolution.

There are three possible actions for the WSD and Commission in response to any electrical corporation's WMP: approval, denial, or approval with conditions. In the case of the WMP resolved here, we ratify the WSD's action to approve the SDG&E's WMP with conditions. To the extent we do not impose conditions on elements of the WMP, those elements are approved as plan components. This approval does not relieve the electrical corporation from any and all otherwise applicable permitting, ratemaking, or other legal and regulatory obligations.

The list of conditions of approval is in Appendix A.

1. Background

Catastrophic wildfires in 2017-19 led the California Legislature to pass Senate Bill (SB) 901 in 2018 and its successor AB 1054 in 2019, as well as AB 111. SB 901 and AB 1054 contain detailed requirements for electrical corporations' WMPs and provide a 90-day review cycle of WMPs by the WSD. AB 111 establishes a new division, the WSD, within the Commission. The duties of the WSD are contained in Pub. Util. Code Section 326(a), including to evaluate, oversee and enforce electrical corporations' compliance with wildfire safety requirements, and develop and recommend to the Commission performance metrics to achieve maximum feasible wildfire risk reduction. SB 901 required a formal Commission proceeding for WMP review in 2019, and to that end the Commission reviewed the 2019 WMPs in Rulemaking (R.) 18-10-007. The decisions dispensing of the 2019 WMPs also added additional requirements for the 2020 WMPs.

After the Commission issued its WMP decisions on May 30, 2019,[1] the Legislature enacted AB 1054. AB 1054 contains similar WMP requirements to SB 901 but allows WMPs a three-year rather than one-year duration. AB 1054 also requires the WSD to review and approve, deny or approve with conditions the electrical corporations' WMPs, with Commission ratification to follow thereafter. AB 1054 also requires establishment of a Wildfire Safety Advisory Board (WSAB), with appointees from the California Governor and Legislature, to provide comment on the 2020 WMPs and develop and make recommendations related to the metrics used to evaluate WMPs in 2021 and beyond.[2]

Building on lessons learned from the WMP review process in 2019, the WSD developed and required all electrical corporations to conform their WMPs to a set of new WMP Guidelines starting in 2020.[3] For 2020, the WMP Guidelines add requirements on detail, data, and other supporting information. The WMP Guidelines are designed 1) to increase standardization of information collected on electrical corporations' wildfire risk exposure, 2) enable systematic and uniform review of information each electrical corporation submits, and 3) move electrical corporations toward an effective long-term wildfire mitigation strategy, with systematic tracking of improvements over time.

The Commission adopted Resolution WSD-001 setting forth the process for WSD and Commission review of the 2020 WMPs. The resolution called for electrical corporations to submit their 2020 WMPs on February 7, 2020. SDG&E submitted its WMP on that date.

Shortly after electrical corporations filed their WMPs, the WSD held two sets of all-day workshops over four days, on February 18, 19, 24 and 25. The February 18-19, 2020 informational workshops called for the electrical corporations to present to stakeholders and the public details on their WMPs, and for stakeholders to ask questions, raise concerns, and otherwise comment on the WMPs' contents. The February 24-25, 2020 technical workshops focused more in depth on key provisions of the WMPs: vegetation management, system

[1] Decisions 19-05-036, 037, 038, 039, 040 and 041 (May 30, 2019).

[2] Pub. Util. Code § 8386.3 (Wildfire Safety Division), § 326.1 (Wildfire Safety Advisory Board).

[3] A ruling issued on December 19, 2019 in proceeding R.18-10-007 described and attached all of the material electrical corporations were required to use in submitting their 2020 WMPs.

hardening, risk-spend efficiency emerging technology and reduction of the scale and scope of Public Safety Power Shutoff (PSPS) events. Again, stakeholder and public input was offered.[4]

Stakeholders were also allowed to submit comments on the WMP, to which the electrical corporation replied. Stakeholders and members of the public commented on the WMPs by April 7, 2020, and the electrical corporations responded to those comments by April 16, 2020.

2. Notice

In accordance with Pub. Util. Code § 8386(d), notice of SDG&E's WMP was given by posting of the WMP on the WSD's webpage, at www.cpuc.ca.gov/wildfiremitigationplans, on February 7, 2020, in accordance with the requirements of Pub. Util. Code Section 8386(d). Further, the electrical corporation served its 2020 WMP on the Commission's existing WMP formal proceeding (R.18-10-007) service list, as Resolution WSD-001 provided. Resolution WSD-001 also required the filer to post all data request responses, as well as any document referenced in its WMP, on its own website and update the website with notice to the R.18-10-007 service list on a weekly basis.

3. Wildfire Safety Division Analysis of WMP

To reach a conclusion about each WMP, the WSD reviewed each electrical corporation's 2020 WMP (including updates and Geographic Information System (GIS) data), public and WSAB input, responses to WSD data requests, and responses to the maturity model survey questions. The WSD also issued three sets of data requests to SDG&E for missing information, clarification, and supplementation where necessary. Upon completion of this review, the WSD determined whether SDG&E's 2020 WMP should either be approved without conditions, approved with conditions, or denied.

There are three possible actions for the WSD in response to any electrical corporation's WMP: approval, denial, or approval with conditions. To reach its conclusion, the WSD reviewed the WMPs for compliance with every aspect of

[4] Presentations, agendas and other details of the workshops appear on the Commission's WMP homepage, located at www.cpuc.ca.gov/wildfiremitigationsplans.

the WMP Guidelines and AB 1054 and requirements of the 2019 WMP Decisions. The WSD designed the WMP Guidelines to require that each filer have a comprehensive WMP that contains all elements required by AB 1054. Thus, for example, every WMP must contain plans for vegetation management, system hardening, inspections of assets and vegetation, situational awareness, a plan to reduce and manage PSPS events, customer and first responder outreach and coordination, risk analysis, GIS data, a short- and long-term vision, analysis of causes of ignition, and many other elements. To evaluate WMPs, the WSD assessed each plan for its completeness, the technical feasibility and effectiveness of its initiatives, whether proposed initiatives were an efficient use of resources, and a demonstration of a sufficiently growth-oriented approach to reducing utility-related wildfire risk over time.

A conditional approval explains each missing or inadequate component in the WMP. The 2020 WMP Resolutions for each electrical corporation contain a set of "Deficiencies "and associated "Conditions" to remedy those deficiencies. Each deficiency is categorized into one of the following categories, with Class A being the most serious:

1. Class A – aspects of the WMP are lacking or flawed.
2. Class B – insufficient detail or justification provided in WMP.
3. Class C – gaps in baseline or historical data, as required in 2020 WMP Guidelines.

Class A deficiencies are of the highest concern and require an electrical corporation to develop and submit to the WSD within 45 days of Commission ratification of this Resolution, a Remedial Compliance Plan (RCP) to resolve the identified deficiency. Class B deficiencies are of medium concern and require reporting by the electrical corporation to provide missing data or update its progress in its quarterly report. Such reporting will be either on a one-time basis or ongoing as set forth in each condition. Class C deficiencies require the electrical corporation to submit additional detail and information or otherwise come into compliance in its 2021 annual WMP update. Detailed descriptions of the RCP and quarterly reports are contained in Resolution WSD-002, the Guidance Resolution on 2020 Wildfire Mitigation Plans.

The WSD identified a number of deficiencies in SDG&E's WMP, which can be found in Appendix A.

4. Wildfire Safety Advisory Board Input

The WSAB provided recommendations on the WMPs of SDG&E, Pacific Gas and Electric Company (PG&E), and Southern California Edison Company (SCE) on April 15, 2020. The WSD has considered the WSAB's recommendations, and this Resolution incorporates WSAB's input throughout.

The WSAB focused its recommendations on high-level input and identification of shortcomings in the 2020 WMPs to inform upcoming wildfire mitigation efforts. WSAB recommendations focused on the following areas: vegetation management and inspection; grid design and system hardening; resource allocation methodology; communication with the community, and planning, preparedness, and recovery after PSPS events.

5. Public and Stakeholder Comment

The following individuals and organizations submitted comments on April 7, 2020 on SDG&E's WMP and made the following points:

Many stakeholders found the WMPs lacking in specific and complete data, especially related to Risk Spend Efficiency (RSE). Generally, stakeholders also found comparing utilities difficult due to inconsistent reporting across utilities. The utilities received some appreciation for the general expansion of programs, with some stakeholders noting specific improvements in situational awareness. Many also reiterated that approval of the WMPs neither approves the scope nor portfolio of programs nor authorizes rate recovery.

California Environmental Justice Alliance (CEJA)

- Socioeconomic risk factors are inconsistently considered across programs. Socioeconomic factors should be systematically considered to ensure vulnerable populations are not left behind.
- The investor owned utilities (IOUs) should be required to conduct more analysis to determine the effectiveness of inspections.
- WMPs should be updated to reflect outreach requirements articulated in the D.20-03-004.

Kevin Collins

- The WMPs are too vague and lack clear obligatory completion dates and specific performance targets.
- There are promising proposals in fault detection and situational awareness, but it is unclear if or when they will be installed and operational.

Green Power Institute (GPI)

- The connections between the results of the bowtie analysis, RSE, and proposed WMP activities are unclear.
- SDG&E should provide additional data justifying large clearances and an estimate of the number of line-miles to which they will apply.
- There are large differences in Risk Reduction and RSE values across IOUs for similar vegetation management activities.
- SDG&E's overreliance on Subject Matter Experts to make critical decisions can lead to inconsistencies, errors, and other issues.

Mussey Grade Road Alliance (MGRA)

- Issues in the WMPs should require resolution prior to approval.
- SDG&E should provide cost and safety justification for its choice of steel pole over other pole hardening mechanisms as required in D.19-05-039.
- SDG&E should justify its 25-foot post-trim clearance as laid out in D.19-05-039.
- SDG&E's RSE found covered conductor to be favorable and the WMP should be updated with a more aggressive covered conductor program or an explanation of why it would be inappropriate to implement.

- SDG&E should seek to expand its underground program in HFTD areas if undergrounding truly has an RSE equivalent to other hardening.

Orange County Fire Authority (OCFA)

- PG&E, SCE, and SDG&E should allocate resources to jointly fund the Fire Integrated Real Time Intelligence System (FIRIS) program.

Perimeter Solutions

- The electrical corporations do not discuss the use of fire-retardant products.

Protect Our Communities Foundation (POC)

- SDG&E's metrics are not focused on reducing wildfire risks and fail to address outcomes.
- SDG&E's vegetation management practices, including its 25-foot post-trim clearance, are unreasonable and not supported by scientific evidence.
- SDG&E's hardening decisions are not based on reasonable or proven safety criteria.
- SDG&E's undergrounding proposals are not cost-effective or focused on reducing risk in the highest areas.
- SDG&E's generator grant and microgrid programs are not cost effective.

Public Advocate's Office of the Public Utilities Commission (Cal Advocates)

- SDG&E should revise the system hardening section of its WMP to focus on wildfire risk reduction rather than reliability.
- As required in D.19-05-039, SDG&E should clearly demonstrate that the 25-foot post-prune clearance is feasible and necessary.

- Each utility should submit a supplement demonstrating the accuracy of its wildfire models.
- The utilities are not sufficiently transparent about how resource and operational constraints affect their decision-making.
- Electrical corporations should provide a detailed justification of why undergrounding is an acceptable hardening strategy in locations where it is proposed.

Rural Counties of California Representatives (RCRC)

- More information is needed to better understand the extent the utilities will be able to scale back the use of PSPS events over time.
- Multi-channel communications are essential and electrical corporations should be cautious in assuming that customers can easily "click through" a hyperlink for more information.
- WMPs lack details that are necessary to ensure vulnerable populations are protected.
- A tool should be developed to compare the cost/benefit across utilities.

Alan Stein

- The COVID-19 shutdown has invalidated timelines in the WMPs and the plans should be revised and resubmitted.
- An analysis should be conducted to compare the cost of cutting all trees that can hit lines to the cost of the multi-step process of determining which specific trees to cut.

The Utility Reform Network (TURN)

- Programs should not be authorized for tracking in the wildfire mitigation memorandum account simply because they are claimed to be new or incremental.

- Compliance inspection and repair programs should not be deemed new activities. The utilities should not include traditional maintenance inspection and repair compliance programs as costs in the wildfire mitigation memorandum accounts.

On April 16, 2020, SDG&E submitted reply comments, addressing parties' comments as follows:

- As laid out in AB 1054, the reasonableness review of WMP costs are to take place in the GRC and thus, findings related to cost recovery are not needed.
- There is no reason to adopt TURN's recommendation that electrical corporations should be prohibited from applying for cost recovery a second time after being denied recovery in a prior proceeding.
- SDG&E's 2019 WMP was approved in D.19-05-039 and POC's allegations that SDG&E's 2019 WMP was deficient are unfounded.
- SDG&E agrees with parties who advocate for workshops to refine the WMP Guidelines and Templates in advance of the 2021 WMP updates.
- SDG&E's WMP addresses potential feasibility concerns and constraints, which are discussed in each section where applicable.
- Wildfire risk days were reduced in 2019 from 2017 and 2018, but it does not mean that wildfire risk due to climate change is declining.
- SDG&E disagrees that more discussion of RSE is necessary in future WMPs.
- SDG&E has been working on identifying strategies to reduce PSPS impacts.
- Going forward, RSE calculations on wildfire mitigations should be consistent with the GRC Safety Model and

Assessment Proceeding (S-MAP) and Risk Assessment Mitigation Phase (RAMP).

- SDG&E disagrees with the assertion that its hardening strategy places too much emphasis on service reliability, SDG&E's analysis of segments involves the evaluation of both wildfire and PSPS risks.
- The location of hardening does not necessarily align with the economic characteristics of a population because the location where a fire ignites is different from areas to which it can spread.
- The purpose of choosing an appropriate pole material is to withstand the known local wind conditions, including potential extreme Santa Ana wind events.
- SDG&E agrees with MGRA on the benefits of covered conductor and is committed to further understanding of the technology.
- It is unnecessary and inappropriate to require the submittal of an advice letter justifying an undergrounding project before beginning construction.
- SDG&E is considering only a few hundred miles of highest-risk circuits to underground.
- POC's proposal, to equip all customers in Tier 3 of the HFTD with a solar plus battery storage system, should be rejected.
- SDG&E's Generator Grant Program does not create additional fire threats and provides a means to power critical life support equipment or other small appliances in the event of a PSPS.
- SDG&E is developing the Whole Home Generator Program to serve customers impacted by PSPS, which is implemented to prevent the risk of wildfire and is therefore covered under Public Utilities Code Section 8386.

- SDG&E's drone inspection program supplements current GO 165 inspections and does not replace existing inspection programs.
- SDG&E has an internal audit process examine the effectiveness of inspections.
- Expanded 25-foot clearances, where properly applied, can be an effective mitigation tool. The 25-foot clearance is not intended to be applied universally.
- POC's recommended six-foot separation of vegetation is inadequate to maintain safety.
- The electrical corporations engage through industry conferences and joint meetings to discuss strategy and best practices of their vegetation management programs.

6. Discussion

The Commission has reviewed the actions taken by the WSD pursuant to Public Utilities Code section 8386.3, the recommendations Wildfire Safety Advisory Board (WSAB), stakeholder comments served on the R.18-10-007 service list, the underlying documents, and other public input. The following aspects of the Wildfire Mitigation Plan (WMP) raised concerns to the WSD:

1) *Risk modeling and decision-making*. San Diego Gas and Electric Company's (SDG&E) WMP does not adequately address how SDG&E factors its modeling into decision-making, and whether and how it updates its models based on lessons learned.
2) *Situational awareness and forecasting*. SDG&E's WMP does not adequately address how it utilizes its Fire Potential Index (FPI), or whether it has fully explored early fault detection measures.
3) *Grid design and system hardening*. SDG&E's WMP does not adequately identify or describe the details of its more costly planned investments, or of its decision-making process with respect to its various planned initiatives.

4) *Asset management and inspections*. SDG&E's WMP does not adequately describe the details of its risk assessment process, or whether and how it considers alternatives to identified risk-reduction initiatives.
5) *Vegetation management*. SDG&E's WMP lacks details with which to evaluate its vegetation management practices, in particular whether and how its "enhanced" vegetation management practices provide incremental risk reduction benefits.
6) *Public Safety Power Shutoff (PSPS)*. SDG&E's WMP does not adequately describe SDG&E's current PSPS protocols.
7) *Resource allocation*. SDG&E's WMP does not adequately address the details of its resource allocation process. In particular, the WMP lacks details regarding whether and how specific mitigations or initiatives reduce the need to resort to a PSPS event.

Therefore, the WSD's approval of SDG&E's WMP is conditioned on SDG&E's compliance with each of the conditions set forth in Appendix A.

The following sections discuss in detail the SDG&E's WMP, its contents, required changes, and conditions imposed on approval. The discussion follows the template provided in WMP Guidelines attached to the R.18-10-007 Administrative Law Judge's December 16, 2019 ruling as Attachment 1.

6.1. Persons Responsible for Executing the Plan

This section of the WMP requires that the filer designate a company executive with overall responsibility for the plan, and program owners specific to each component of the plan. The section also requires a senior officer to verify the contents of the plan, and the filer to designate key personnel responsible for major areas of the WMP.

SDG&E provided the required information.

6.2. Metrics and Underlying Data

The metrics and underlying data section of the WMP represents an innovation over the 2019 WMP requirements in that all filers are required to report standardized and normalized data on many aspects, including their performance metrics, conditions in their service territories, grid topology, and wildfire mitigation efforts. To remedy a concern with the 2019 plans, the 2020 WMP Guidelines disallow the practice of filers characterizing only "program targets" (e.g., number of miles of covered conductor installed or trees trimmed) as the "metrics" required by the statute.[10] For 2020, the WMP Guidelines require filers to group metrics and program targets as follows.

- *Progress metrics* track how much electrical corporation wildfire mitigation activity has managed to change the conditions of electrical corporation's wildfire risk exposure in terms of drivers of ignition probability.
- *Outcome metrics* measure the performance of an electrical corporation and its service territory in terms of both leading and lagging indicators of wildfire risk, PSPS risk, and other direct and indirect consequences of wildfire and PSPS, including the potential unintended consequences of wildfire mitigation work.
- *Program targets* measure tracking of proposed wildfire mitigation activities against the scope and pace of those activities as laid out in the WMPs but do not track the efficacy of those activities. The primary use of these program targets in 2020 will be to gauge electrical corporation follow-through on WMPs.

This section first requires filers to discuss how the their plans have evolved since 2019, outline major themes and lessons learned from implementation of their 2019 plan and discuss how the filers performance against metrics used in their 2019 plans have informed their 2020 WMP. A series of tables then requires reporting of recent performance on predefined outcome and progress metrics, including numbers of ignitions, near misses, PSPS events, worker and public

deaths and injuries, acreage affected, and assets destroyed by fire, and critical infrastructure impacts, as well as additional metrics the filer proposes to use to ensure the effectiveness of its efforts in quantitatively mitigating the risk of utility-caused catastrophic wildfire. This section also requires filers to detail their methodology for calculating or modeling potential impact of ignitions, including all data inputs used, data selection and treatment methodologies, assumptions, equations or algorithms used and types of outputs produced. Finally, this section requires filers to provide a number of Geographic Information System (GIS) files detailing spatial information about their service territory and performance, including recent weather patterns, location of recent ignitions, area and duration of PSPS events, location of lines and assets, geographic and population characteristics and location of planned initiatives. A detailed summary and comparison of performance metrics and current state of utility service territories is provided in Appendix B.

Appendix B, Figure 2.2a depicts near misses normalized by circuit miles, and Appendix B, Figure 2.3a depicts normalized ignitions. Appendix B, Figure 2.6a provides a detailed breakdown of ignitions by driver. It is important to consider these data in conjunction to better understand the scope, frequency, and scale of the drivers of utility ignition. Presumably, there are relationships between near misses and ignitions that can better inform utility performance and track progress.

Like PG&E, SDG&E's near miss incidents per circuit mile have fluctuated over the past 5 years; however, SDG&E's fluctuations have not been as drastic – varying by approximately 10-15% annually, and at a much lower range (*i.e.*, between 0.16 and 0.19 incidents per circuit mile as opposed to a range of 0.34 to 0.51 for PG&E). While SDG&E's near miss incidents per circuit mile have fluctuated, SDG&E has been successful in reducing its number of ignitions. Over the past five years, SDG&E's ignitions per circuit mile have been declining or remaining flat, with a clear downward trend. Notably, SDG&E reported a 33% reduction in ignitions per circuit mile from 2018 to 2019, driven by a nearly 70% reduction in contact from object ignitions.

Appendix B, Figure 1.5a shows the total annual Red Flag Warning (RFW) circuit mile days for each reporting year. This figure is leveraged as a proxy for differentiating fire weather potential (as a function of RFWs) year over year for

each IOU. Appendix B, Figure 2.9a shows values for acres burned, total and normalized across the WMP-defined metric of RFW Circuit Mile Days. The intent of this normalizing metric is to account for varying fire weather conditions using a common metric of RFWs. However, it should be noted that additional study and refinement are necessary, as it seems there are inconsistencies in how utilities calculated this value.

As shown in Appendix B, Figure 2.9a, SDG&E reported a total of 213 acres burned in 2015. However, since that time, SDG&E's reported acres burned fell to less than 30 acres annually.

SDG&E's WMP states that key themes and lessons learned from its 2019 wildfire mitigation initiatives include reducing or eliminating PSPS impacts to the extent feasible; development or enhancement of various risk indices to better target vegetation and fuel management operations; use of drones for inspections of distribution assets and exploring the potential for machine learning to detect issues on its electric facilities; utilizing wind variability data to inform PSPS decisions; and further development of program target metrics.

SDG&E was asked to determine how its plan evolved in 2020 as a consequence of these 2019 lessons. In general, SDG&E's WMP reiterates that learnings from the 2019 WMP were harnessed for this 2020 WMP. Although SDG&E's plan does not address major changes or explain whether it has avoided repeating poor choices from 2019, it is apparent from its descriptions of risk factors such as wind variability, and its ability to identify the implications of such studies, that SDG&E has incorporated new findings into its operations and decision-making. SDG&E also acknowledged, in response to a WSD data request, that a key lesson learned from its PSPS metrics is that mitigation efforts such as system hardening should be determined based on a more comprehensive circuit-level or segment-level assessment and not just an asset-level assessment, in order to take into account the grid connectivity and effects of PSPS.

SDG&E stands out from its peers in relation to its GIS capability. SDG&E provided many GIS asset data layers and high levels of asset age information. SDG&E submitted a metadata file that can be opened without the need for specialized software, and provided definitions for various domain codes (e.g., DAR = Insulators-Ceramic, Standard, 20K), which facilitated the WSD's review of

the data. SDG&E provided a very large volume of data requested beyond requirements (e.g., photos with damage locations).

6.3. Baseline Ignition Probability and Wildfire Risk Exposure

The baseline ignition probability and wildfire risk exposure section of the WMP requires electrical corporations to report baseline conditions and recent information related to weather patterns, drivers of ignition probability, use of PSPS, current state of utility equipment, and summary data on weather stations and fault indicators. The section then requires the filer to provide information on its planned additions, removals, and upgrades of equipment and assets by the end of the 3-year plan term, in urban, rural and highly rural areas. The information must describe the scope of hardening efforts (i.e., circuit miles treated), distinguish between efforts for distribution and transmission assets, and identify certain locational characteristics (i.e., urban, rural and highly rural) of targeted areas. Filers must also report the sources of ignition over the past 5 years due to ignition drivers outlined in the annual fire incident data collection report template adopted in D.14-02-015.

Considering that managing the potential sources of ignition from its infrastructure, operations, and equipment is the single most controllable aspect of utility wildfire risk, understanding the sources and drivers of near misses and ignitions is one of the most critical capabilities in reducing utility-caused wildfire risk. Moreover, it is important to consider these performance metrics relative to annual fluctuations in weather conditions (i.e., incidence of RFW days, days with high wind conditions – 95th and 99th percentile winds, and high fire potential days measured relative to utility FPIs or other fire danger rating systems) to better gauge relationships and thresholds between weather and fire potential indicators and utility ignitions. As such, the discussion in this section focuses on recent weather patterns, key drivers of utility ignitions and frequencies of such ignitions, recent use of PSPS, the current baseline conditions of the utility's service territory and equipment, and locations of planned utility upgrades.

Out of the three largest California electrical corporations, SDG&E has the least number of overhead distribution lines with approximately 6,488 circuit miles, which is significantly less than PG&E or SCE overhead distribution circuit miles. SDG&E also has a very high percentage of underground distribution circuit

miles (compared to PG&E and SCE), which is an important mitigation measure to prevent ignitions.

The historical weather patterns provided from SDG&E show an overall increase in RFW days and top 30% FPI, 95th percentile wind conditions, and 99th percentile wind conditions except for 2019. Wind data for the last three years (2017, 2018, 2019) are the highest of the five. This raises concerns for increasing wind-related risks to electrical assets. The types of utility equipment that would increase ignition risk would be any type of equipment that can produce arcs or sparks. This could also include areas where conductors can touch or fail, due to line slap or weakened connections. Further investigation into how wire-to-wire contact / contamination incidents are detected and analyzed and what further mitigation measures are available is warranted.

Additional detailed data for incidents and ignitions for each historical year is needed in the future for further statistical analysis, to assess variance and distribution of ignitions across different incidents. Further, SDG&E should investigate how to utilize the average percentage probability of ignition per incident as a metric to observe annual trends and whether other metrics and statistical data analysis would be prudent to track.

Deficiencies and Conditions – Baseline Ignition and Wildfire Risk Exposure

Contact from objects

Deficiency (SDGE-1, Class B): SDG&E reports a high number of ignitions related to balloon contact.

Although SDG&E has relatively low volume of ignitions (annual average over five-year reporting period of 23, compared to 440 for PG&E and 106 for SCE), over the past five years, SDG&E reports a high percentage (18%) of ignitions related to balloon contact when normalized for overhead circuit miles. Compared to PG&E, SDG&E reports more than three times the rate of such balloon contact ignitions. However, SDG&E's percentage of balloon contact ignitions as a fraction of total ignitions is similar to SCE's, which seems to indicate that this issue is more concentrated in southern California.

Considering the fact that SDG&E has substantially less overhead circuitry, as compared to peer utilities, the higher incidence of balloon caused ignitions potentially correlates to an increased risk from this ignition driver in SDG&E's service territory. However, beyond some targeted covered conductor installation and undergrounding and covered conductor initiatives, SDG&E's WMP lacks detail on which initiatives it is implementing to reduce the risk of balloon contact ignitions.

Condition (SDGE-1, Class B): In its first quarterly report, SDG&E shall:

i) list and describe the actions it is taking to study the occurrence and potential consequence of metallic balloon caused ignitions in its service territory;

ii) efforts it is taking to mitigate the occurrence of such ignitions in the future;

iii) the status of the action and efforts identified in (i) and (ii) above, including timelines for completion;

iv) the specific initiatives in its 2020 WMP that aim to reduce the risk of balloon caused ignitions; and

v) its goals, targets and quantitative measures for evaluating effectiveness of the initiatives identified in (iv) at reducing the risk of balloon caused ignitions.

Deficiency (SDGE-2, Class B): SDG&E reports a high number of ignitions related to vehicle contact.

Although SDG&E has relatively low volume of ignitions (annual average over five-year reporting period of 23, compared to 440 for PG&E and 106 for SCE), over the past five years, SDG&E reports approximately twice the rate of ignitions related to vehicle contact compared to PG&E and SCE, when normalized for overhead circuit miles. Considering the fact that SDG&E has substantially less overhead circuitry, as compared to peer utilities, the higher incidence of vehicle contact ignitions potentially correlates to an increased risk from this ignition driver in SDG&E's service territory. However, beyond undergrounding, SDG&E's WMP lacks detail on which initiatives it is implementing to reduce the risk of vehicle contact ignitions.

Condition (SDGE-2, Class B): In its first quarterly report, SDG&E shall:

i) list and describe the actions it is taking to study the occurrence and potential consequence of vehicle contact caused ignitions in its service territory;

ii) efforts it is taking to mitigate the occurrence of such ignitions in the future;

iii) the status of the action and efforts identified in (i) and (ii) above, including timelines for completion;

iv) the specific initiatives in its 2020 WMP that aim to reduce the risk of vehicle contact caused ignitions; and

v) its goals, targets and quantitative measures for evaluating effectiveness of the initiatives identified in (iv) at reducing the risk of vehicle contact caused ignitions.

Definition/characterization of PSPS events

SDG&E appears to count PSPS events in a manner inconsistent with PG&E and SCE, which complicates efforts to evaluate the use of PSPS across the electrical corporations. Specifically, SDG&E's initial WMP listed 99 PSPS events, reflecting its interpretation of each "event" as a decision on whether to shut off an individual circuit. In response to a WSD data request, SDG&E revised its data to align with its PSPS post-event reports, thus showing four PSPS events. Consistency in how the electrical corporations report data is important.

This deficiency is not unique to SDG&E. As such, this deficiency and associated condition is addressed in the Guidance Resolution, WSD-002.

6.4. Inputs to the Plan, Including Current and Directional Vision for Wildfire Risk Exposure

This section of the WMP requires the filer to rank and discuss trends anticipated to exhibit the greatest change and have the greatest impact on ignition probability and wildfire consequence, within the filer's service territory, over the next 10 years. First, filers must set forth objectives over the following timeframes: Before the upcoming wildfire season, before the next annual update, within the next 3 years, and within the next 10 years.

Filers must describe how the utility assesses wildfire risk in terms of ignition probability and estimated wildfire consequence, using Commission adopted risk assessment requirements (for large electrical corporations) from the General Rate Case (GRC) Safety Model and Assessment Proceeding (S-MAP) and Risk Assessment Mitigation Phase (RAMP). The filer must describe how the utility monitors and accounts for the contribution of weather and fuel to ignition probability and wildfire consequence; identify any areas where the Commission's High Fire Threat District (HFTD) should be modified; and rank trends anticipated to have the greatest impact on ignition probability and wildfire consequence.

A key area which filers are required to address is Public Safety Power Shutoffs., In 2019 electrical corporations proactively shutoff power to millions of customers for multiple days, resulting in numerous cascading consequences, including associated public safety concerns. The Commission has been clear in its judgement that those events were unacceptable and cannot be repeated. The new 2020 WMP Guidelines direct electrical corporations to describe lessons learned from past PSPS events and quantify the projected decrease of circuits and customers affected by PSPS as a result of implementing wildfire mitigation programs and strategies contained in the WMP.

SDG&E's WMP clearly lists and describes its evolving program, with specific reference to the maturity model, and includes a useful table (Table 2 in its WMP) showing where the company expects to be in each of the 10 categories by the years 2023 and 2030. Although this is a useful overview, it lacks detailed timelines for making progress on specific efforts.

SDG&E has invested considerable resources in analyzing weather, vegetation and other data and developing predictive models to identify and reduce the risk of ignition probability, described at length in Section 4.2 of its WMP. As discussed in Section 3 above, one outcome of these efforts was SDG&E's finding that more significant impacts occur as a region reaches its top wind speeds (i.e., 95th and 99th percentiles); SDG&E incorporated this finding into its criteria for initiating a PSPS event in 2019. In 2019, there were no ignitions of consequence

and reduced near misses in areas of consequence; however, SDG&E also implemented its largest single PSPS event to date.[5]

Before the next wildfire season, SDG&E intends to focus on mitigating the impacts of PSPS events on customers by examining further switching opportunities and expanding microgrids and customer generator programs. SDG&E anticipates eliminating impacts to more than 7,000 customers who had previously been subject to a PSPS event. SDG&E does not quantify the projected decrease in circuits affected by PSPS as a result of its wildfire mitigations, but explains it is undergoing a segment-by-segment analysis to identify circuits that could or should be sectionalized. SDG&E's future WMPs must include projections for the decrease in circuits affected by PSPS as a result of its wildfire mitigations.

Over the next 3 years and beyond (*i.e.,* over the next 10 years), SDG&E's WMP anticipates that climate change and its associated impacts on factors such as fuel density and moisture will be the greatest macro trend impacting utility ignition probability and estimated wildfire consequence. SDG&E's 10-year vision for wildfire risk mitigation, therefore, includes efforts at increasing the company's automation of analytics and grid operations and more real-time updates of risk models. With respect to mitigation of PSPS impacts, SDG&E aims to reduce or minimize the customer impacts of PSPS events through a combination of strategic undergrounding, overhead hardening, covered conductor, remote sectionalizing, microgrids, and individual customer generation. SDG&E's WMP explains the company is currently evaluating these options; we expect future updates and WMPs to provide specific progress metrics that enable evaluation of the effectiveness of these efforts.

SDG&E's discussion of ignition probability drivers identifies several factors, including contacts by foreign objects and equipment failure, which have informed its work on system hardening efforts such as installation of covered conductor. This section of the WMP refers to SDG&E's Ignition Management Program, described in Section 5.3.7.4 (Data Governance – Tracking and analysis of near miss data) as a program for tracking ignitions and potential ignitions in

[5] SDG&E's largest recorded PSPS event impacted approximately 27,700 customers. See SDG&E WMP, at 35.

order to perform root cause analysis and identify patterns or correlations, which SDG&E uses to inform metrics, operations and system hardening efforts. As the Ignition Management Program was started recently in 2019 and SDG&E continues to develop it, we expect SDG&E's future WMPs to provide a more detailed and comprehensive description of its methodology for determining ignition probability from events.

6.5. Wildfire Mitigation Activity for Each Year of the 3-Year WMP Term, Including Expected Outcomes of the 3-Year Plan

This section of the WMPs is the heart of the plans and requires the filer to describe each mitigation measure it will undertake to reduce the risk of catastrophic wildfire caused by the utility's infrastructure, operations, and equipment. A description of each type of measure appears below, with elaboration in Appendix D to this Resolution.

First, the WMP Guidelines require a description of the overall wildfire mitigation strategy over the following timeframes: before the upcoming wildfire season, before the next annual update, within the next 3 years and within the next 10 years. The filer is required to describe its approach to determining how to manage wildfire risk (in terms of ignition probability and estimated wildfire consequence) as distinct from other safety risks. The filer is required to summarize its major investments over the past year, lessons learned, and changes planned for 2020-2022; describe challenges associated with limited resources; and outline how the filer expects new technologies to help achieve reduction in wildfire risk.

Section 5 requires the filer to explain how it will monitor and audit the implementation of the plan and lay out the data the filer relies on in operating the grid and keeping it safe. It then requires detailed descriptions of specific mitigations or programs, in the following order:

1) Risk assessment and mapping
2) Situational awareness and forecasting
3) Grid design and system hardening
4) Asset management and inspections
5) Vegetation management and inspections
6) Grid operations and operating protocols, including PSPS

7) Data governance
8) Resource allocation methodology
9) Emergency planning and preparedness
10) Stakeholder cooperation and community engagement.

Below, this Resolution evaluates the mitigations (or initiatives) SDG&E proposed for each of the 10 foregoing categories. After identifying each proposed mitigation or group of mitigations, the Resolution discusses concerns with the proposal, and identifies any conditions imposed. Provided in Appendix B, for illustrative purposes, are summaries of the filer's projected costs across highest total cost initiatives as well as projected costs across the highest category initiatives.

6.5.1. Risk Assessment and Mapping

This section of the WMP requires the filer to discuss the risk assessment and mapping initiatives implemented to minimize the risk of its equipment causing wildfires. Filers must describe initiatives related to maps and modelling of: overall wildfire risk, ignition probability, wildfire consequence, risk-reduction impact, match-drop simulations, and climate/weather driven risks. This section also requires the electrical corporation to provide data on spending, miles of infrastructure treated, spend per treated line mile, ignition probability drivers targeted, projected risk reduction achieved from implementing the initiative, risk spend efficiency, and other (i.e., non-ignition) risk drivers addressed by the initiative.

The parameters of risk assessment and resource allocation to reduce wildfire risk derive from the S-MAP and RAMP for GRCs. The risk assessment methodology that governs the three large electrical corporations was determined via a joint Settlement Agreement (Settlement) among parties and approved in D.18-12-014. The process is being refined with each new RAMP/GRC cycle. At present, SDG&E is the next utility in line to file a RAMP for its GRC.

The S-MAP/RAMP RSE methodology applies to all identified safety risks, not just wildfires, although utility-caused wildfires are considered the top safety risk for each of the electric distribution utilities and therefore a big component of the risk assessment program. The WMP is an opportunity to put the S-MAP/RAMP process into practice for all covered utilities.

Each large electrical corporation is at a different stage in using the Settlement methodology approved in D.18-12-014. Going forward each is must employ uniform processes and scoring methods to assess current risk, estimate risk reduction attributable to its proposed mitigations, and establish a risk-spend efficiency score for each mitigation by dividing the risk reduction by the total cost of the mitigation program.

RSE is a tool to allocate resources toward actions that offer the greatest risk reduction per dollar spent. In accordance with the Settlement, electrical corporations are required to conduct this analysis at the asset level to compare effectiveness of certain mitigations to alternatives.

SDG&E's risk assessment and mapping plans consist of a primarily automated risk assessment and mapping methodology referred to as its Wildfire Risk Reduction Model (WRRM), which includes a version focused on long term planning and a second, operational version (WRRM-Ops), focused on supporting emergency activities. SDG&E's WRRM incorporates a large amount (more than two terabytes) of data and resulting risk factors to provide climate- and weather-driven risk, ignition probability, risk-reduction, and wildfire consequence mapping and modelling capabilities. However, the WMP does not adequately address how SDG&E factors its modeling into decision-making, nor whether and how it updates its models based on lessons learned.

Deficiencies and Conditions – Risk assessment and mapping

Deficiency (SDGE-3, Class B): SDG&E fails to explain how it plans to incorporate lessons learned into updates of its risk models.

In Section 5.3.1.1 of its WMP, SDG&E fails to explain how it plans to incorporate lessons learned into updates of its risk models. For instance, the model does not currently factor in spot fires or emergency resources.[6]

Condition (SDGE-3, Class B): In its first quarterly report, SDG&E shall describe:

i) how it plans to incorporate learnings into its risk models, including a specific implementation timeline;

[6] *See* SDG&E response to WSD data request SDGE-43895-C-330.

ii) changes or updates to its risk models identified after 2020 WMP submission; and

iii) the status of implementing the changes and updates identified in (ii) above, including the expected timeframe for completion.

6.5.2. Situational Awareness and Forecasting

The situational awareness and forecasting section of the WMP requires the filer to discuss its use of cameras, weather stations, weather forecasting and modeling tools, grid monitoring sensors, fault indicators, and equipment monitoring. Situational awareness requires the electrical corporation to be aware of actual ignitions in real time, and to understand the likelihood of utility ignitions based on grid and asset conditions, wind, fuel conditions, temperature and other factors.

The WMP Guidelines refer to key situational awareness measures, including:

1) Installation of advanced weather monitoring and weather stations that collect data on weather conditions to develop weather forecasts and predict where ignition and wildfire spread is likely,
2) Installation of high definition cameras throughout an electrical corporation's service territory, with the ability to control the camera's direction and magnification remotely,
3) Use of continuous monitoring sensors that can provide near real-time information on grid conditions,
4) Use of a fire risk or fire potential index that takes numerous data points in given weather conditions and predicts the likelihood of wildfire, and
5) Use of personnel to physically monitor areas of electric lines and equipment in elevated fire risk conditions.

Generally speaking, SDG&E is leading California electrical corporations with respect to gathering and processing data relating to weather for situational awareness. SDG&E's situational awareness plans consist of extensive camera,

weather monitoring and wireless fault indicator systems; development and further refinement of its FPI, along with a Santa Ana Wildfire Threat Index (SAWTI); and use of field personnel based on system conditions, weather, and wildfire potential. SDG&E shares its FPI-based forecasts daily with local fire agencies, emergency responders, and the National Weather Service. SDG&E's WMP also discusses ongoing development of a circuit risk index, which should enhance decision-making for isolating specific points for future PSPS events. However, the WMP does not adequately address how it utilizes its FPI nor incorporates the outputs of its FPI into protocols and procedures.

Additionally, SDG&E's WMP does not adequately explain or identify what mitigations it takes or plans to take with respect to early fault detection. While fault indicators are helpful with respect to locating faults when they occur, they do not help prevent faults from occurring in the first place. SDG&E also states it has not identified a risk-mitigating application for continuous monitoring sensors.

Deficiencies and Conditions – Situational awareness and forecasting

SDG&E does not adequately explain how it utilizes FPI or incorporates FPI into protocols and procedures. Additionally, SDG&E does not adequately describe how it plans to utilize early fault detection.

Deficiencies such as these are not unique to SDG&E. As such, this deficiency and associated condition is addressed in the Guidance Resolution, WSD-002.

6.5.3. Grid Design and System Hardening

The grid design and system hardening section of the WMPs examine how the filer is designing its system and what it is doing to strengthen its distribution and transmission system and substations to prevent catastrophic wildfire. The grid design and system hardening WMP section also requires discussion of routine and non-routine maintenance programs, including whether the filer replaces or upgrades infrastructure proactively rather than running facilities to failure. Programs in this category, which often cover the most expensive aspects of a WMP, include initiatives such as the installation of covered conductors to replace bare overhead wires, undergrounding of distribution or transmission lines, and

pole replacement programs. The filer is required, at a minimum, to discuss grid design and system hardening in each of the following areas:

1) Capacitor maintenance and replacement,
2) Circuit breaker maintenance and installation to de-energize lines upon detecting a fault,
3) Covered conductor installation,
4) Covered conductor maintenance,
5) Crossarm maintenance, repair, and replacement,
6) Distribution pole replacement and reinforcement, including with composite poles,
7) Expulsion fuse replacement,
8) Grid topology improvements to mitigate or reduce PSPS events,
9) Installation of system automation equipment,
10) Maintenance, repair, and replacement of connectors, including hotline clamps,
11) Mitigation of impact on customers and other residents affected during PSPS event,
12) Other corrective action,
13) Pole loading infrastructure hardening and replacement program based on pole loading assessment program,
14) Transformers maintenance and replacement,
15) Transmission tower maintenance and replacement,
16) Undergrounding of electric lines and/or equipment,
17) Updates to grid topology to minimize risk of ignition in HFTDs, and
18) Other/not listed items if an initiative cannot feasibly be classified within those listed above.

SDG&E will introduce Supervisory Control And Data Acquisition (SCADA) capacitors (30 each in 2020 and 2021 and 40 in 2022[7]) to increase situational awareness during extreme weather conditions and monitor ignition data. SDG&E prioritizes distribution equipment replacement projects according to its WMP prioritization and resource allocation process and utilizes Quality Assurance (QA)/Quality Control (QC) to audit the quality of the installations.

SDG&E plans to use advanced protection devices including microprocessor relays—designed to trip a circuit breaker—with synchro Phasor Measurement Units (PMUs) to measure power quality; automation controllers; line monitors to enable the use of fault protection; and fault detection devices. SDG&E prioritizes distribution equipment replacement projects according to its WMP prioritization and resource allocation process and utilizes QA/QC to audit the quality of the installation.

Many of SDG&E's equipment repair and replacement activities are embedded in its regular operations and maintenance processes. Distribution pole replacement is subject to SDG&E's WMP prioritization and resource allocation process. Replaced poles are audited by SDG&E's Civil/Structural Engineering Department. SDG&E plans to replace 2,010 poles in the HFTD over the next three years.[8]

According to SDG&E there are approximately 11,000 expulsion fuses in its service territory. In 2019, SDG&E replaced these fuses with 2,000 California Department of Forestry and Fire Protection (CAL FIRE)-approved power fuses in the HFTD and plans to replace 3,000 fuses in 2020. Similar to other grid resiliency measures, SDG&E is using a risk prioritization and QA/QC methodology to select the location and audit installed fuses.[9]

SDG&E states it will use WMP prioritization and resource allocation processes to identify if, where and how each of these proposed options will be pursued. Over the next three years, SDG&E will install 30 switches to enable grid sectionalizing

[7] SDG&E Revised WMP updated March 2, 2010, at 69.

[8] *Id.* at 75.

[9] *Id.* at 76.

to mitigate PSPS impacts.[10] With respect to microgrids, SDG&E will examine its ability to serve critical facilities, the amount of undergrounding required, load profiles, and technology solution, i.e. solar, solar + storage, etc. They will also consider grid topology issues, such as whether a community is not in a high-risk PSPS area but receives power from lines that are within a high risk area or whether concentrated critical facilities could potentially remain powered by a microgrid. SDG&E has developed three microgrid projects and has proposed additional projects in the Microgrid rulemaking proceeding. SDG&E has instituted a generator grant program administered by a third-party to medical baseline customers and provides communities with community resource centers during PSPS events. The expanded grant program is intended to be utilized by customers to fund portable generators. SDG&E plans to fund 400 mobile generators and whole house generators in rural communities where the cost of hardening is high from 2020-22.[11]

SDG&E is deploying a privately-owned, Long-Term Evolution (LTE) network to enhance SDG&E's communication network to enable fire prevention and public safety programs.

SDG&E's WMP states it has formed a PSPS mitigation engineering team that will assess and prioritize specific mitigations based on segment-by-segment analysis of circuits prone to PSPS. SDG&E also plans to pilot the use of covered conductor in 2020 and expects the number of circuit miles with covered conductor to increase in 2020 and 2021. The WSD expects specific and detailed data on the results of its segment-by-segment analysis and its covered conductor pilot in future WMPs to enable the Commission to validate the effectiveness of SDG&E's prioritization and resource allocation methods.

SDG&E's WMP does not adequately identify or describe the details of its more costly planned investments or of its decision-making process with respect to its various planned initiatives. Although SDG&E's WMP states that it uses prioritization methods and resource allocation processes to identify if, where and how each of these measures should be pursued, the WMP does not provide an adequate description of those methods and processes nor how specifically they

[10] *Id.* at 77.

[11] *Id.* at 84.

lead SDG&E to identify which measures to pursue, where to pursue them, and in what order to pursue them. Such detail is particularly important for significant investments, i.e., additional overhead distribution facilities and undergrounding, in order to evaluate whether SDG&E is pursuing these very costly mitigations in the most efficient manner.

Deficiencies and Conditions – Grid design and system hardening

Deficiency (SDGE-4, Class B): SDG&E does not provide sufficient detail on strategic undergrounding pilots.

In addressing its undergrounding efforts, SDG&E states it will determine a need to strategically underground lines through pilots that establish a baseline for project scope, cost and schedule, but does not provide sufficient detail on how it will report and share its findings.

Condition (SDGE-4, Class B): In its first quarterly report, SDG&E shall:

i) detail its plans to report and share the findings of its undergrounding pilot initiatives;

ii) outline what data it plans to collect and report for project scope, cost and schedule of these projects, and

iii) explain how it intends to track and measure the effectiveness of these projects in comparison to other WMP initiatives.

Deficiency (SDGE-5, Class B): SDG&E does not provide sufficient detail on need for regulatory assistance.

SDG&E acknowledges potential easement and line extension barriers (from main road to house) related to undergrounding efforts, and requests regulatory assistance to alleviate barriers. However, SDG&E does not provide specific detail regarding the type of regulatory assistance needed, the required timeframe for such actions, or its plans for obtaining the needed assistance from regulators.

Condition (SDGE-5, Class B): In its first quarterly report, SDG&E shall:

i) list and describe all regulatory barriers to implementation of its undergrounding initiatives,

ii) detail its proposals for specific regulatory changes needed to eliminate the barriers identified in (i) above; and

iii) describe its efforts and actions over the past 3 years to collaborate with regulators and other entities responsible for implementing the regulatory changes identified in (ii) above, including status and expected timeline for implementation.

Deficiency (SDGE-6, Class B): SDG&E does not provide sufficient detail on plans for reinforcing transmission lines.

SDG&E's WMP lacks sufficient detail to demonstrate the efficacy of its plans for reinforcing transmission lines – to have at least one hardened line into every transmission substation in the HFTD by 2020 and to harden 66 miles within a three-year period.[12]

Condition (SDGE-6, Class B): In its first quarterly report, SDG&E shall:

i) detail how it plans to measure and report the efficacy of its plans to reinforce transmission lines and, specifically, to have at least one hardened line into every transmission substation in the HFTD by 2020 and to harden 66 miles within the three-year plan period;

ii) list and describe the specific actions and initiatives it plans to implement to achieve this plan for its transmission lines; and

iii) the status and timeline for completion of all actions and initiatives identified in (ii) above.

6.5.4. Asset Management and Inspections

The asset management and inspections portion of the WMP Guidelines requires the filer to discuss power line/infrastructure inspections for distribution and

[12] *Id.* at 88.

transmission assets within the HFTD, including infrared, LiDAR, substation, patrol, and detailed inspections, designed to minimize the risk of its facilities or equipment causing wildfires. The filer must describe its protocols relating to maintenance of any electric lines or equipment that could, directly or indirectly, relate to wildfire ignition. The filer must also describe how it ensures inspections are done properly through a program of quality control.

SDG&E's asset management and inspection plans consist of mandated maintenance and inspection programs,[13] annual patrol inspections of every distribution facility; and detailed overhead visual inspections of HFTD Tier 3 areas on a three-year cycle. SDG&E has begun piloting a Circuit Ownership program, by which field employees submit circuit vulnerabilities so that such vulnerabilities can be timely repaired and prevent a potential ignition; a program dashboard enables oversight and tracking of issues, and should enable assessment of the effectiveness of this pilot. SDG&E plans to pilot periodic infrared inspections to identify "hot" connections that have the potential to cause wire downs and ignitions upon failure; and drone inspections to obtain zoomed-in photos of connectors and hardware. SDG&E considers that LiDAR be used in the context of engineering and design, but not for inspections of facilities.

However, the WMP does not adequately describe the details of its risk assessment process, or whether and how it considers alternatives to identified risk-reduction initiatives. SDG&E's determination to conduct annual patrol inspections of every distribution facility, and detailed overhead visual inspections of HFTD Tier 3 areas every three years, suggest that it considers wildfire risks to determine how often and where to focus its inspection efforts, but does not identify or describe the specific risk(s) it intends to mitigate with each type of inspection. Also, as a proportion of its overall expenditures (from 2020 to 2022), SDG&E plans to spend more than twice as much as PG&E or SCE on asset management and inspections; a large portion of these planned expenditures are for drone inspections. Consideration of alternatives is not

[13] Relevant maintenance and inspection mandates include: General Order (GO) 165 (inspection cycles for electric distribution facilities), GO 128 (underground electric supply systems construction and maintenance), GO 95 (overhead electric line construction and maintenance), GO 174 (substation system inspection and maintenance); and Public Resources Code Sections 4292 and 4293 (minimum clearances around utility poles).

apparent from SDG&E's WMP. Similarly, although the general description of factors SDG&E considers when determining asset replacements is valuable, the WMP lacks a detailed breakdown of the factors contributing to its specific planned additions.

Appendix B, Figure 2.1a represents a breakdown of utility inspection findings per circuit mile and delineates the findings in accordance to the priority levels defined in GO 95, Rule 18. In accordance with Rule 18, priority Level 1 findings are those that pose "an immediate risk of high potential impact to safety or reliability." Priority Level 2 findings are any non-immediate "risk[s] of at least moderate potential impact to safety or reliability…" GO 95, Rule 18 considers priority Level 3 findings as, "any risk of low potential impact to safety or reliability." Pursuant to Rule 18, each priority level corresponds to a maximum timeframe for corrective action (*i.e.* to fix the identified GO 95 violation or safety hazard).

As shown in Appendix B, Figure 2.1a, SDG&E's reported inspection findings remained relatively constant from 2015 through 2019. Because SDG&E corrects all inspection findings within the timeframe corresponding to Level 2 findings, SDG&E reports no Level 3 findings. In 2019, 96% of SDG&E's inspection findings were priority Level 2 (compared to 64% for SCE and only 6% for PG&E).

Deficiencies and Conditions – Asset management and inspections

SDG&E does not provide adequate details of its risk assessment process and how it considers alternatives to identify the most effective risk-reduction initiative, nor does SDG&E identify and describe the specific risk(s) it intends to mitigate with each type of inspection.

This deficiency is not unique to SDG&E. As such, this deficiency and associated condition is addressed in the Guidance Resolution, WSD-002.

6.5.5. Vegetation Management and Inspections

This section of the WMP Guidelines requires filers to discuss vegetation inspections, including inspections that go beyond existing regulation, as well as infrared, LiDAR, and patrol inspections of vegetation around distribution and transmission lines/equipment, quality control of those inspections, and limitations on the availability of workers. The filer must also discuss

collaborative efforts with local land managers to leverage opportunities for fuel treatment activities and fire break creation, methodology for identifying at-risk vegetation, how trim clearances beyond minimum regulations are determined, and how the filer considers and addresses environmental and community impacts related to tree trimming and removal (erosion, flooding, and the like).

SDG&E's vegetation management and inspection programs consist of tracking and maintaining a database of trees and poles that are located close to electric infrastructure; regular patrolling, pruning, and identifying and removing hazardous trees and replacing with the right tree at the right place; pole maintenance with pole brushing and clearing; training first responders in electrical and fire awareness; and red flag operations. SDG&E describes its enhanced vegetation management as (1) conducting a second hazard tree inspection activity throughout the entire HFTD to coincide with post-trim audit activity; (2) removing hazard trees with strike potential; and (3) extending the clearance area around lines from 12 feet to 25 feet at the time of trim. SDG&E states that trees with strike potential are inspected and those identified as hazard trees are mitigated. SDG&E also identifies target species for removal and offers a program to replace trees under right tree-right place criteria. Although this process appears somewhat effective, it still allows trees to become a hazard before being mitigated. Trees with strike potential that do not meet the hazard criteria can still fail and contact the lines and cause ignitions.

There are several areas of concern in SDG&E's 2020 vegetation management proposals. We describe each below and prescribe conditions with which SDG&E is required to comply.

Deficiencies and Conditions – vegetation management

Although the adequacy of staff resources appears less of a concern than for the other large electrical corporations, SDG&E's WMP does not detail its recruitment and training efforts for vegetation management personnel. All utilities have experienced some level of difficulty finding sufficient numbers of experienced personnel, particularly in vegetation management. Utilities describe a competitive environment that makes recruiting talent difficult. However, utilities do not explain in detail the range of activities that they are undertaking to recruit and train personnel to grow the overall pool of talent.

This deficiency is not unique to SDG&E. As such, this deficiency and associated condition is addressed in the Guidance Resolution, WSD-002.

Deficiency (SDGE-7, Class B): Potential redundancies in vegetation management activities.

The scope and magnitude of its vegetation management activities raised concerns about potential redundancies. SDG&E seems to provide potentially redundant programs and measures, and greater evaluation of its "Master Schedule" as mentioned throughout Section 5.3.5 was needed. The Master Schedule, supplied in response to a WSD data request, only displays the schedule for routine vegetation inspections and work.

Condition (SDGE-7, Class B): In its first quarterly report, SDG&E shall:

i) Describe how it assesses its vegetation management processes to determine effectiveness; and

ii) Provide additional evaluation on how inspections overlap with one another both in timing and scope, including evaluation of effectiveness in terms of number and quality of findings per inspection. For example, if not many findings are being made, then SDG&E should provide an assessment of whether additional efforts are necessary.

Deficiency (SDGE-8, Class B): Consideration of environmental impacts, local community input.

SDG&E does not provide sufficient detail regarding how it measures and accounts for the potential environmental impacts related to its vegetation management work or how it incorporates input from local stakeholders in planning and executing its vegetation management work.

Condition (SDGE-8, Class B): In its first quarterly report, SDG&E shall describe:

i) how it measures and accounts for the potential environmental impacts related to its vegetation management work; and

ii) how it incorporates input from local stakeholders in planning and executing its vegetation management work.

Deficiency (SDGE-9, Class B): SDG&E does not explain how investments in undergrounding reduce planned vegetation management spend.

SDG&E indicates in its WMP plans for significant investment in undergrounding. We anticipate that increased underground infrastructure will result in cost savings from reduced or eliminated need for vegetation management for underground infrastructure. However, SDG&E's WMP reports no changes in vegetation management costs over the plan period (i.e. 2020-2022) and lacks detail on how its planned investment in undergrounding initiatives correlates to cost savings in other initiatives, such as vegetation management.

Condition (SDGE-9, Class B): In its first quarterly report, SDG&E shall describe:

i) whether and how it takes ancillary cost savings into account when evaluating the effectiveness of undergrounding initiatives; and

ii) how SDG&E plans to account for realized cost savings through a reduced need for certain vegetation management activities, resulting from its undergrounding investments.

Deficiency (SDGE-10, Class C): Use of outside entities for fuel reduction.

SDG&E's fuel reduction plans are still in an elementary phase. Scrutiny on the effectiveness of using grants and outside entities to perform such work is needed to determine if this effort is more or less effective than having SDG&E staff perform the work themselves, or if this measure alleviates critical resource constraints.

Condition (SDGE-10, Class C): In its annual update, SDG&E shall detail:

i) whether fuel reduction projects via outside entities are being completed; and

ii) how they tie into the overall vegetation management program in terms of effectiveness.

Deficiency (SDGE11, Class B): Lack of detail on veg. mgmt. around substations.

In Section 5.3.5, SDG&E's WMP lacks detail regarding its vegetation management efforts for substations beyond maintaining conductor clearance.

Condition (SDGE-11, Class B): In its first quarterly report, SDG&E shall:

i) describe how it plans fuels reduction work around its substations; and

ii) whether and how it maintains defensible space around its substations.

Deficiency (SDGE-12, Class B): Details of quality assurance, quality control.

SDG&E's WMP describes a quality assurance and quality control efforts designed to evaluate and ensure the effectiveness of its vegetation management and inspection activities. However, SDG&E's WMP lacks sufficient detail regarding how these quality assurance and quality control efforts measure and evaluate the effectiveness of vegetation management and inspection activities.

Condition (SDGE-12, Class B): In its first quarterly report, SDG&E shall:

i) describe the process and measures for how its quality assurance and quality control (QA/QC) efforts evaluate the effectiveness of vegetation management and inspection activities;

ii) list and describe all QA/QC audits performed, the timing of the audits, and the quantitative results of such audits; and

iii) list and describe all changes implemented as a result of QA/QC audit findings.

Deficiency (SDGE-13, Class A): Lack of risk reduction or other supporting data for increased time-of-trim clearances.

Throughout its WMP, SDG&E expresses an intent to obtain greater clearances than those required or recommended by the Commission. As these vegetation management programs continue to grow in scope, detailed discussion or

evidence of the effect of these increased vegetation clearances on utility ignitions remains lacking. Specifically, SDG&E does not detail proposed guidelines for where such a clearance is both feasible and necessary, or scientific evidence or other data showing that such clearance will reduce wildfire risk, as directed in our decision approving SDG&E's 2019 WMP.[14] Further details were provided to the WSD in response to a data request, specifically that SDG&E performs a tree-by-tree analysis with particular concern for "at-risk species" to determine if a 25-foot clearance is beneficial.

SDG&E's WMP does not provide results or analysis of the effectiveness of this measure since implementation of its 2019 WMP, as required by D.19-05-039. Without the ability to understand or even observe an incremental benefit of this increased clearance, it will be difficult to determine the effectiveness of this measure.

Condition (SDGE-13, Class A): SDG&E shall submit an RCP with a plan for the following:

i. Comparing areas with and without enhanced post-trim clearances to measure the extent to which post-trim clearance distances affect probability of vegetation caused ignitions and outages.

ii. Collaborating with PG&E and SCE in accordance with Conditions PG&E-26 and SCE-12 to develop a consensus methodology for how to measure post-trim vegetation clearance distance impacts on the probability of vegetation caused ignitions and outages.

Deficiency (SDGE-14, Class B): Granularity of "at-risk species". SDG&E identifies five types of "at-risk" trees - eucalyptus, palm, oak, pine, and sycamore.

[14] D.19-05-039, at 10: "In SDG&E's next WMP, it shall propose, in detail, guidelines for where a 25-foot post-trim clearance for vegetation management is both feasible and necessary. If SDG&E plans to create a 25-foot clearance during this WMP cycle, it may only do so if such a practice is supported by scientific evidence or other data showing that such clearance will reduce risk under wildfire conditions.; and Ordering Paragraphs 5 and 6.

However, SDG&E identifies these trees by their genus, and based on additional review, the WSD has discovered that not all tree species within a genus are considered "at-risk" trees. As such, SDG&E's WMP lacks sufficient detail to identify the tree species it considers "at-risk" and subject to its enhanced vegetation management programs.

Condition (SDGE-14, Class B): In its first quarterly report, SDG&E shall detail the following:

i) all tree species within the genera identified in its list of "at-risk" trees;

ii) the measures, properties and characteristics it considers in identifying "at-risk" trees; and

iii) the threshold values of the measures, properties and characteristics identified in (ii) above that result in a species being defined as "at-risk."

6.5.6. Grid Operations and Operating Protocols, Including PSPS

The grid operations and operating protocols section of the WMP requires discussion of ways the filer operates its system to reduce wildfire risk and the potential scope and scale of PSPS events. For example, disabling the reclosing function of reclosers[15] during periods of high fire danger (e.g., during RFW conditions) can reduce utility ignition potential by minimizing the duration and amount of energy released when there is a fault. This section also requires discussion of work procedures in elevated fire risk conditions, PSPS events and protocols, and whether the filer has secured on-call ignition prevention and suppression resources and services.

SDG&E has fully deployed SCADA-controlled reclosers on its distribution system; each recloser is tied into specific wind anemometer locations, allowing

[15] A recloser is a high voltage circuit breaker that detects and interrupts momentary fault conditions on the grid. The device can reclose automatically and reopen if a fault condition is still detected. However, if a recloser closes a circuit that poses the risk of ignition, wildfire may be the result. For that reason, reclosers are disabled in certain high fire risk conditions. During overcurrent situations, circuit breakers trip a switch that shuts off power to the electrical line.

for targeted applications of PSPS to the areas that pose the most significant real-time risk of wildfire. During periods of elevated wildfire risk conditions, all distribution reclosing functions are disabled on circuits located within the HFTD but may include other circuits if the burn environment is conducive to large wildfires. SDG&E has also developed the ability to enable more sensitive relay settings on overhead distribution reclosers. The relay settings improve sensitivity of fault detection and the speed at which faults are cleared. These reclosing protocols are validated annually prior to the start of fire season.

SDG&E uses Wildfire Infrastructure Protection Teams consisting of contractors for wildfire prevention and ignition mitigation services, which is paired with SDG&E personnel during times of elevated wildfire potential. Contractor teams include two qualified firefighters, firefighting equipment and 300 gallons of water. These teams are intended to prevent an ignition from work being performed and other heat sources that exist on a construction site. In 2019, SDG&E increased the number of teams to eight. Plans are to expand the program depending on the volume of work in fire prone portions of their serviced territory.

SDG&E monitors environmental conditions throughout the year, designated as 1) Normal, 2) Elevated Condition, or 3) Extreme or RFW Conditions. These designations define specific operating procedures and guidelines tailored to the severity of environmental conditions.

In 2019, SDG&E formalized its process of reviewing all wildfire procedures with a new position, Training and Plan Enhancement Fire Coordinator. SDG&E intends to provide training on procedures in conditions of elevated fire risk.

SDG&E provided information in a narrative form on the current processes, i.e. FPI and Vegetation Management Index; organizational structure, i.e. cross - function team of engineers, meteorologists and risk managers; and personnel training and guidelines, and planned improvements, i.e. the cross functional team will conduct further analysis to assess SDG&E asset risk due to wildfires.

SDG&E has on-site and on-call resources and services to utilize during a wildfire event. This includes a year-round aviation firefighting program, regarding which SDG&E notes that state firefighting resources are often diverted to fight fires north of its service territory, and an industrial fire brigade contractor with

specialized training with electric fires. These resources are stationed at facilities near the center of SDG&E's service territory.

Appendix B, Figure 1.5a shows the total annual RFW circuit mile days for each reporting year. This figure is used as a proxy for differentiating fire weather potential—as a function of RFWs—year over year for each electrical corporation. Appendix B, Figure 2.8a displays annual customer hours of PSPS events normalized across the WMP-defined metric of RFW Circuit Mile Days. Normalizing accounts for varying fire weather conditions using a common metric of RFWs. Further study and refinement is necessary, as there are inconsistencies in how the electrical corporations calculate this value. The following analysis discusses both normalized and total values for PSPS customer hours.[16]

While SDG&E began implementing PSPS back in 2013, SDG&E reports that it did not initiate any PSPS events in 2015 and 2016. However, since 2017, SDG&E's total customer hours of outages associated with PSPS has increased nearly 35% annually. During this same period (2017-2019), as the duration of SDG&E PSPS outages increased, in accordance with the figure in Appendix B, Figure 1.5a, the RFW circuit mile days in its territory steadily decreased over 30% annually, on average. Interestingly, while SDG&E's reported RFW circuit mile days in 2019 are approximately equal to 2016 values (3% more in 2019), there were no PSPS events initiated in 2016 compared to more than 1.3 million customer hours of PSPS related outages in 2019. Even SDG&E, who has the most mature PSPS program of the large electrical corporations and is regarded as an industry leader in wildfire mitigation, has reported an average annual increase of nearly 110% in PSPS customer hours when normalized for RFW circuit mile days, signaling the increased reliance on PSPS as a mitigation measure. As discussed in Section 4, SDG&E suggests this increase is a direct result of it incorporating its 95th and 99th percentile wind variation data as a criterion for calling a PSPS event.

Although SDG&E is clearly focused on mitigating the impact of future PSPS events and describes an expansive PSPS outreach strategy, the WMP does not adequately describe other areas crucial to an overall PSPS mitigation strategy. In particular, it does not describe SDG&E's protocols for re-energization after a

[16] Total customer hours of PSPS obtained from appear in SDG&E's WMP Table 12.

PSPS event, beyond a general statement that it conducts patrols and corrects any issues such as clearing debris or repairing damaged equipment prior to re-energization.

Deficiencies and Conditions – Grid Operations and Operating Protocols, including PSPS

SDG&E does not provide adequate detail on its strategy to reduce scale and scope of PSPS nor protocols for re-energization after a PSPS event.

This deficiency is not unique to SDG&E. As such, this deficiency and associated condition is addressed in the Guidance Resolution, WSD-002.

6.5.7. Data Governance

The data governance section of the WMP Guidelines seeks information on the filer's initiatives to create a centralized wildfire-related data repository, conduct collaborative research on utility ignition and wildfire, document and share wildfire-related data and algorithms, and track and analyze near miss data.

SDG&E's data governance plans consist of developing two types of centralized data repositories. One is for asset data management, aimed at consolidating data to track the condition of assets and using predictive analysis to identify likelihood of failure. SDG&E states it will be using this information to inform its risk management strategies. The other centralized data repository is a GIS platform aimed at sharing PSPS data with state agencies and was developed to support emergency preparedness efforts. SDG&E's WMP also describes its collaborative efforts with academia, government and community members to develop and share its data tools and algorithms; SDG&E plans to establish a Fire Science and Innovation Lab in 2020 to continue collaborative research and problem-solving for preventing ignitions, mitigating fires and building resiliency. SDG&E also plans to continue developing its Ignition Management Program, for analysis of near ignition events, and will integrate the outputs of this analysis into its WMP metrics, operational and system hardening initiatives. However, the WMP does not adequately address whether and how SDG&E will centralize other related datasets (e.g., ignition, outage, near miss data) with its asset condition data.

Deficiencies and Conditions – Data Governance

Deficiency (SDGE-15, Class B): Details of centralized data repository. SDG&E indicates efforts to create a centralized data repository, however, its WMP lacks sufficient detail of the data to be included.

Condition (SDGE-15, Class B): In its first quarterly report, SDG&E shall:

i) list and describe all data it plans to provide in its centralized repository;

ii) list and describe the sources and treatment of all data identified in (i) above; and

iii) describe the frequency it plans to update all data identified in (i) above.

6.5.8. Resource Allocation Methodology

The resource allocation section of the WMPs requires the filer to describe its methodology for prioritizing programs to minimize the risk of its equipment or facilities causing wildfires in the most cost-efficient manner. This section requires filers to discuss risk reduction scenario analysis and provide a risk spend efficiency analysis for each aspect of the plan.

SDG&E's resource allocation plans consist of a resource allocation methodology and system that conforms with ISO 55000;[17] development of an enterprise-wide, multi-attribute value framework for evaluating capital investments; and risk spend efficiency calculations for most but not all of its wildfire mitigation activities.

However, the WMP does not adequately address the details of its resource allocation process. For example, while SDG&E outlines numerous efforts to improve its ability to more effectively conduct PSPS and minimize its impacts, there is a clear gap and absence of detail on the relationship between various hardening, vegetation management, and asset management initiatives and corresponding impacts on thresholds for initiating PSPS events. Also, while SDG&E describes its resource allocation methodology in narrative, it does not provide spending data, as this planning and risk function is part of its utility

[17] ISO 55000 is an international standard for establishment, implementation, maintenance, and improvement of an asset management system.

capital planning process. Similarly, in terms of risk assessment, SDG&E's WMP simply refers to its RAMP and to Section 5.4 of its WMP, which is not specific to wildfire reductions, rather than provide information responsive to the WMP Guidelines.

Appendix B, Figure 3.1a shows the total planned spend for each utility during the plan period (2020-2022). The planned spend is also presented as normalized values – normalized over circuit miles and HFTD circuit miles. Considering that much of the planned spend will occur in HFTD areas, the HFTD circuit mile normalization is focused on in this analysis. However, utility-provided information was used to populate Appendix B, Figure 3.1a and there are errors in utility calculations for spend totals, as well as inconsistent interpretations on what data to report (i.e., overhead vs. total miles, transmission vs. distribution, and other) for circuit mileage.

As shown in Appendix B, Figure 3.1a, when assessing planned spend per circuit mile in HFTD, large electrical corporations are roughly planning to spend similar amounts. On average, the large electrical corporations plan to spend $305K per HFTD circuit mile.

SDG&E's planned spend per HFTD circuit mile, approximately $291 thousand, is at the low end of the large electrical corporations and is approximately 4.5% less than the average of PG&E, SCE and its planned spending.

Appendix B, Figures 3.2a and 3.3a show the same information – planned spend by category for the plan period – in different formats. The planned spend is normalized by HFTD circuit miles. Utility-provided information was used to populate the information in Appendix B, Figures 3.2a and 3.3a and there are errors in utility calculations for spend totals, as well as inconsistent interpretations on what data to report, such as overhead vs. total miles and transmission vs. distribution, for circuit mileage.

As shown in Appendix B, Figures 3.2a and 3.3a, over 90% of all large electrical corporations' planned spending is allocated to the following four categories: (1) grid design and system hardening, (2) vegetation management and inspections, (3) asset management and inspections, and (4) grid operations and protocols (mostly PSPS). On average, the large electrical corporations plan to allocate

approximately 93% of their planned spend on initiatives across these four WMP categories. All large electrical corporations plan to spend more than half their total budget on grid design and system hardening initiatives and approximately 5% of their budget on other enabling initiatives (e.g., situational awareness and risk assessment and mapping).

In comparing planned spend allocation to PG&E and SCE across the four categories identified above, SDG&E plans to allocate twice the percentage of its budget to asset management and inspection initiatives, despite having more underground circuit miles, as a percentage of total circuit miles, compared to PG&E and SCE.

Appendix B, Figure 3.6a lists the top five initiatives by planned spend for SDG&E. It is important to recall that these are individual initiatives and do not comprise the full suite of activities within each category. Appendix B, Figure 3.6b lists the top three initiatives within each of the top four categories. The top initiatives by planned spend are only shown for the top four spend categories because less than 10% of planned spend is attributed to the other six WMP categories.

Appendix B, Figure 3.6a shows that SDG&E allocates nearly 30% of its total planned budget on undergrounding. This is especially noteworthy when considering that compared to PG&E and SCE, SDG&E currently has the largest share of its total system underground, yet it plans to allocate significantly more resources (as a fraction of total expenditures) on more undergrounding. This undergrounding work is planned to ramp up over the plan period with an average annual spend of approximately $125 million – about 25 times more than SDG&E spent on undergrounding as part of its 2019 WMP ($5 million). Interestingly, as SDG&E plans to ramp up undergrounding efforts during the plan period, it plans on significantly decreasing its spending on hardening of overhead distribution lines during that same time. Also noteworthy is the fact that SDG&E plans to allocate nearly 10% of its total planned spend during the WMP period on installation of an LTE communication network to support its vast deployment of automated sensory devices and SCADA enabled equipment. SDG&E is the only electrical corporation planning to allocate such a significant portion of its spending on development of high-speed communication network.

SDG&E indicates this LTE network is intended to mitigate communication gaps in rural areas from external communication providers.

In response to maturity model survey questions regarding capability 14, SDG&E indicates that it projects to have the ability to estimate risk spend efficiencies for hardening initiatives at the circuit level.

Deficiencies and Conditions – Resource allocation methodology

SDG&E does not adequately address the details of its resource allocation process.

This deficiency is not unique to SDG&E. As such, this deficiency and associated condition is addressed in the Guidance Resolution, WSD-002.

6.5.9. Emergency Planning and Preparedness

The WMP Guidelines require a general description of the filer's overall emergency preparedness and response plan, including discussion of how the plan is consistent with legal requirements for customer support before, during and after a wildfire, including support for low income customers, billing adjustments, deposit waivers, extended payment plan, suspension of disconnection and nonpayment fees, and repairs. Filers are also required to describe emergency communications before, during, and after a wildfire in English, Spanish, and other languages required by the Commission.

The WMP Guidelines also require discussion of the filer's plans for coordination with first responders and other public safety organizations, plans to prepare for and restore service, including workforce mobilization and prepositioning of equipment and employees, and a showing that the filer has an adequate and trained workforce to promptly restore service after a major event.

SDG&E's emergency planning and preparedness plans consist of customer support programs, emergency communications, coordination with public safety partners, and planning/preparation for workforce mobilization under an Incident Command System (ICS) framework designed for service restoration. SDG&E states it is adding personnel for after-action review and PSPS coordination. In total, SDG&E plans to spend approximately $18 million, or one percent of its total planned spending on emergency planning and preparedness.

SDG&E has developed a robust notification and communications program over the years with multiple modes of communication. SDG&E's WMP states its communications protocols are agnostic of the emergency type.

6.5.10. Stakeholder Cooperation and Community Engagement

The final topic covered in Section 5 relates to the extent to which the filer will engage the communities it serves and cooperate and share best practices with community members, industry partners, government and public safety agencies, and others engaged in utility-related wildfire mitigation.

SDG&E's stakeholder cooperation and community engagement consist of community outreach and education before, during and after a wildfire or PSPS, including in-language communications; development of a joint fire prevention plan with local stakeholders; partnering with local emergency response and participation in community preparedness efforts; community resource centers located in or near areas likely to be impacted by PSPS events; and cooperation with suppression agencies. However, the WMP does not adequately address whether and how SDG&E engages in cooperative fuel reduction work.

Deficiencies and Conditions – Stakeholder cooperation and community engagement

Deficiency (SDGE-16, Class B): Details of cooperative fuel reduction work.

A large portion of SDG&E's HFTD area falls within federal lands. As such, it is imperative that SDG&E maintain close coordination and working relationships with the U.S. Forest Service (USFS), who is responsible for managing federal lands. SDG&E identifies specific ways in which it coordinates with the USFS, which appear sufficient for receiving permits for fuel reduction, but SDG&E does not address the resources needed to collaborate on fuel reduction efforts and establish formal agreements.

Condition (SDGE-16, Class B): In its first quarterly report, SDG&E shall describe:

i) whether it plans to collaborate with the USFS on fuel reduction programs in its service territory;

ii) what programs or agreements, if any, it has in place with the USFS for fuel reduction programs;

iii) the timeline for implementing initiatives identified in (i) and (ii);

iv) how it plans to identify the resources needed to collaborate with the USFS on fuel reduction; and

v) the status of reaching any formal agreements on fuel reduction efforts.

7. Maturity evaluation

In 2020, the WSD introduced a new Utility Wildfire Mitigation Maturity Model, to establish a baseline understanding of utilities' current and projected capabilities and assess whether each utility is progressing sufficiently to improve its ability to mitigate wildfire risk effectively. The maturity model also serves as an objective means of comparing across utilities and provides a framework for driving utility progress in wildfire risk mitigation over time. WMP filers were required to complete a survey in which they answered specific questions which assessed their existing and future wildfire mitigation practices across 52 capabilities at the time of filing and at the end of the 3-year plan horizon. The 52 capabilities are mapped to the same 10 categories identified in Section 5 above.[18]

The maturity model will continue to evolve each year to reflect best practices and lessons learned. With the inaugural use of the maturity model in 2020, it is important to note that the resulting maturity score is to be informative of a utility's capabilities within the context of the underlying assessment criteria. Accordingly, it is essential that the maturity assessment scores are understood within the context of the qualitative detail supporting each score. The model results require context and should not be interpreted as the final word on an electrical corporation's wildfire mitigation capabilities without an understanding of the scoring process described in the Guidance Resolution. As such, the final maturity model outputs should be viewed as levels or thresholds – they are not absolute scores.

[18] A detailed description of the purpose and use of the maturity model is provided the Guidance Resolution being issued concurrently with the instant Resolution.

Compared to peer utilities, SDG&E's wildfire mitigation program is currently in a more mature state and SDG&E is focused on development of more advanced capabilities. Despite having a relatively mature wildfire mitigation program, SDG&E plans to advance its capabilities across several categories, including risk assessment and mapping and vegetation management and inspections. For example, in its response to maturity model survey questions regarding capability 22, SDG&E currently determines inspection schedules using a static map but indicates plans to schedule vegetation inspections based on risk by 2023. SDG&E plans to enhance its climate scenario modeling to account for changes in geography, vegetation and extreme weather caused by climate change. SDG&E also plans to increase the confidence interval used in its ignition risk modeling to above 80%, as well as increasing the granularity of its quantitative wildfire and PSPS risk reduction estimates to the circuit-level. Additional advanced capabilities SDG&E plans to grow include enhancing its assessment of wildfire consequence modeling outputs and real-time updates to its weather forecasts with machine learning.

SDG&E's maturity assessment reveals measurable growth in grid design and system hardening capabilities in several forms. This includes taking PSPS into account in its initiative prioritization methodology, determining initiative specific RSE estimates at the circuit-level and independently evaluating the performance and efficacy of new initiatives. When it comes to vegetation inspection and management capabilities, SDG&E currently has a centralized inventory of its vegetation clearances but plans to supplement this inventory with information including tree health and moisture content. SDG&E also indicates plans to schedule vegetation management work based on predictive modeling and leverage models of ignition risk, limb failure and local climate to determine appropriate post-trim clearances.

SDG&E projects growth in its data governance capabilities. SDG&E currently has a centralized database of situational, operational and risk data but plans to supplement this by cataloguing all fire-related data, algorithms, analyses and data processes into a single document and include explanation of sources,

assumptions, and documentation of analyses. Most of SDG&E's projected advancements in resource allocation methodology maturity is found in more granular estimates. By the end of the plan term, SDG&E projects to provide climate-based risk projections, RSE figures for vegetation management and system hardening initiatives and RSE estimates for all its WMP initiatives at the circuit-level. SDG&E's high maturity scores for stakeholder cooperation and community engagement are indicative of a well communicated and executed program that engages stakeholders early in processes and develops strong collaborative partnerships.

A detailed summary of SDG&E's maturity model responses and results is provided in Attachment C.

8. Impact of COVID-19 Pandemic

After SDG&E submitted its WMP, on March 19, 2020, California Governor Gavin Newsom signed Executive Order N-33-20 requiring Californians to stay at home to combat the spread of the COVID-19 virus. Specifically, Governor Newsom required Californians to heed the order of the California State Public Health Officer and the Director of the California Department of Public Health that all individuals living in California stay home or at their place of residence, except as needed to maintain continuity of operation of the federal critical infrastructure sectors, in order to address the public health emergency presented by the COVID-19 disease (stay-at-home order).[19]

As articulated in the March 27, 2020 joint letters[20] of the WSD, CAL FIRE and the California Governor's Office of Emergency Services regarding essential wildfire and PSPS mitigation work during COVID-19 sent to each electrical corporation, electrical corporations are expected to continue to prioritize essential safety work. The WSD expects the electrical corporations to make every effort to keep WMP implementation progress on track, including necessary coordination with

[19] Executive Order N-30-20. Available at http://covid19.ca.gov/img/Executive-Order-N-30-20.pdf.

[20] https://www.cpuc.ca.gov/covid/. Letters to each electrical corporation are found under the heading "Other CPUC Actions", March 27, 2020: Joint Letters to IOUs re: Essential Wildfire and PSPS Mitigation Work.

local jurisdictions. Such effort is essential to ensuring that electrical corporations are prepared for the upcoming and subsequent wildfire seasons, while complying with COVID-19 restrictions requiring residents to shelter-in-place, practice social distancing, and comply with other measures that California's public health officials may recommend or that Governor Newsom or other officials may require in response to the COVID-19 pandemic.

Furthermore, the WSD expects the electrical corporations to continue to make meaningful progress on PSPS mitigation goals, including continuing with sectionalization projects, local outreach and coordination, establishing customer resource centers, and microgrid projects. Electrical corporations are expected to limit planned outage work during this time to wildfire mitigation, PSPS reduction, projects that immediately impact reliability if delayed, and emergency/public safety outages. In addition, electrical corporations are expected to undertake any other critical work related to operating a safe and reliable grid and to mitigate wildfire and/or PSPS risk.

9. Conclusion

- SDG&E's Wildfire Mitigation Plan contains all of the elements required by AB 1054, Pub. Util. Code Section 8386(c) and all the elements required by the WMP Guidelines.
- SDG&E's WMP is approved by the WSD, subject to the conditions set forth in Appendix A.

10. Comments

A draft of this Resolution was served on the service list for R.18-10-007. Comments were allowed under Rule 14.5 of the Commission's Rules of Practice and Procedure. The WSD accepted one set of comments per stakeholder that collectively addressed Draft Resolutions WSD-002 – WSD-009, which represent the totality of the WSD's evaluation of the 2020 WMPs.

The following stakeholders served timely comments on one or more of the WMP Draft Resolutions: Kevin Collins on May 26, 2020; and PG&E, SCE, SDG&E, Bear Valley, California Association of Small and Multi-Jurisdictional Utilities, Horizon

West Transmission, California Environmental Justice Alliance, East Bay Municipal Utility District, Energy Producers and User Coalition, Green Power Institute, Mussey Grade Road Alliance, Protect our Communities Foundation, Public Advocates Office, Catherine Sandoval, County of Santa Cruz, and The Utility Reform Network on May 27, 2020. Additionally, several members of the public submitted input regarding the Draft Resolutions.

In comments to the draft resolution, Protect Our Communities Foundation states the WSD errs in not requiring a remedy for failure to justify 25-foot clearances, as directed by D.19-05-039. Public Advocates Office asserts the WSD has improperly modified D.19-05-039. Arguing against the assertion that it has not complied with D.19-05-039, SDG&E refers to Table 11 of its WMP as indication that a 25-foot post-trim clearance has had a positive impact on wildfire risk for its transmission system, which led it to extend these "enhanced" clearances to the HFTD. SDG&E further explains it is limiting the scope of enhanced clearances to the five highest-risk tree species in the HFTD, approximately 20 percent of trees. Although SDG&E argues that the study called for in Condition SDG&E-13 (prior to modification in the Final Resolution) is "effectively impossible to conduct since such ignitions and outages cannot be simulated," it confirms that it tracks post-trim clearance by tree so it can identify vegetation contacts from a tree with 10-12 foot post-trim clearance separately from vegetation contacts from a tree with 25-foot post-trim clearance.

Although the information provided in SDG&E's comments to the draft resolution provides some insight to the effectiveness and limited scope of this measure, such information should have been included in SDG&E's WMP for examination by stakeholders and the WSD. Therefore, the WSD has modified Condition SDG&E-13 to reflect this deficiency and changed it from Class C to Class A. In addition, the WSD has modified Condition SDG&E-13 to remove the requirement for a study and to provide clarification that SDG&E must collaborate with PG&E and SCE to develop a consensus methodology for how to measure post-trim vegetation clearance distance impacts on the probability of vegetation caused ignitions and outages.

Findings

1. AB 1054 and Commission Resolution WSD-001 require SDG&E to file a WMP for 2020 that conforms with Pub. Util. Code § 8386(c) and guidance provided by the WSD and served on the R.18-10-007 service list on December 16, 2019 by ALJ ruling.

2. The WMPs were reviewed and acted upon with due consideration given to comments received from governmental agencies, the WSAB, members of the public, and all other relevant stakeholders.

3. The WMPs were reviewed and acted upon in compliance with all relevant requirements of state law.

4. SDG&E's WMP contains all the elements required by AB 1054, Pub. Util. Code § 8386(c).

5. SDG&E has satisfied the requirements of Pub. Util. Code § 8386(c) and the WMP Guidelines.

6. Appendix A contains findings regarding deficiencies in SDG&E's WMP.

THEREFORE, IT IS ORDERED THAT:

1. Ratification of the Wildfire Safety Division's approval of San Diego Gas & Electric Company's Wildfire Mitigation Plan is subject to conditions set forth in Appendix A.
2. The Wildfire Safety Division's approval of San Diego Gas & Electric Company's (SDG&E) 2020 Wildfire Mitigation Plan, conditioned upon SDG&E's compliance with the conditions listed in Appendix A, is hereby ratified.
3. San Diego Gas & Electric Company shall submit an update to its Wildfire Mitigation Plan in 2021 according to the forthcoming guidance and schedule issued by the Wildfire Safety Division.
4. San Diego Gas & Electric Company shall submit a new comprehensive 3-year Wildfire Mitigation Plan in 2023.

5. Nothing in this Resolution should be construed as approval of the costs associated with San Diego Gas & Electric Company's Wildfire Mitigation Plan mitigation efforts.
6. San Diego Gas & Electric Company may track the costs associated with its Wildfire Mitigation Plan in a memorandum account, by category of costs, and shall be prepared for Commission review and audit of the accounts at any time.
7. San Diego Gas & Electric Company shall submit a letter to the Wildfire Safety Division containing any updates to scope, timing or other aspects of any mitigation set forth in its Wildfire Mitigation Plan as result of the COVID-19 pandemic, including Public Safety Power Shutoff. The letter shall list items using the same names and sections used in the Wildfire Mitigation Plan and give a thorough description of why the COVID-19 pandemic requires the specified action. The letter shall be submitted within 60 days of issuance of this Resolution and shall be addressed to the Director of the Wildfire Safety Division. The letter shall be emailed to wildfiresafetydivision@cpuc.ca.gov with service on the service list of Rulemaking 18-10-007. If there are no changes to report, no such submission is required.
8. Nothing in this Resolution should be construed as a defense to any enforcement action for a violation of a Commission decision, order, or rule.

This Resolution is effective today.

I certify that the foregoing resolution was duly introduced, passed and adopted at a conference of the Public Utilities Commission of the State of California held on June 11, 2020 the following Commissioners voting favorably thereon:

/s/ ALICE STEBBINS
Alice Stebbins
Executive Director

MARYBEL BATJER
President
LIANE M. RANDOLPH
MARTHA GUZMAN ACEVES
CLIFFORD RECHTSCHAFFEN
GENEVIEVE SHIROMA
Commissioners