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August 17, 2020

VIA EMAIL

Wildfire Safety Division
California Public Utilities Commission
300 Capitol Mall
Sacramento, CA 95814

Re: Reply Comments on Remedial Compliance Plan

Dear Wildfire Safety Division,

Pursuant to the Guidance provided by the Wildfire Safety Division (WSD),¹ San Diego Gas & Electric Company (SDG&E) submits this reply to the August 10, 2020 stakeholder comments filed on SDG&E's Remedial Compliance Plan (RCP) by the Public Advocates Office (CalPA), the Mussey Grade Road Alliance (MGRA), and the Protect Our Communities Foundation (POC). These stakeholders make various claims regarding the sufficiency of the information SDG&E provided in its RCP to satisfy its two Class A deficiencies – Condition Guidance-3, Lack of Risk Modeling to Inform Decision-making; and Condition SDGE-13, Lack of Risk Reduction or Other Supporting Data for Increased Time-of-Trim Clearances. As discussed below, SDG&E's RCP sufficiently resolved the two Class A deficiencies and met the intent of the conditions. In certain instances, SDG&E has provided additional information to address stakeholder concerns, where appropriate.

I. Condition Guidance-3 – Risk Modeling

In Guidance-3, WSD indicated that the utilities did not provide sufficient detail in their 2020 Wildfire Mitigation Plans (WMP) regarding how they are leveraging risk models to target the highest risk portions of the grid. WSD thus directed the utilities to submit the following:

- i. how it intends to apply risk modeling and risk assessment techniques to each initiative in its WMP, with an emphasis on much more targeted use of asset management, vegetation management, grid hardening and PSPS [Public Safety Power Shutoff] based on wildfire risk modeling outputs;

¹ Wildfire Safety Division, Guidance on the Remedial Compliance Plan & Quarterly Report Process Set Forth in Resolution WSD-002 (July 17, 2020) (hereinafter, Guidance).

- ii. identify all wildfire risk analyses it currently performs (including probability and consequence modeling) to determine which mitigation is targeted to circuits and assets where initiatives will provide the greatest benefit to wildfire risk reduction;
- iii. a timeline to leverage its risk modeling outputs to prioritize and target initiatives and set PSPS thresholds, including at least asset management, grid operations, vegetation management, and system hardening initiatives;
- iv. how it intends to incorporate future improvements in risk modeling into initiative prioritization and targeting processes; and
- v. how it intends to adapt its approach based on learnings going forward.²

POC claims that SDG&E did not provide this information.³ MGRA raises concerns with the information SDG&E did provide, claiming it is abbreviated and lacks detail compared to the other utilities' submissions.⁴ CalPA argues that SDG&E's RCP is insufficient with respect to subparts (i) and (ii) of Condition Guidance-3.⁵ These criticisms lack merit.

SDG&E's response to Guidance-3 strictly followed the requirements detailed in that guidance. First, with respect to subpart (i), SDG&E interpreted the phrase "intends to" to be forward-looking. SDG&E thus described how it is developing advanced methodologies to inform how and where each initiative is implemented, rather than repeating how SDG&E has been applying risk models previously described in detail in its Risk Assessment Mitigation Phase (RAMP) Report.⁶ Nevertheless, to resolve any concerns, SDG&E offers additional information from its RAMP Report, which describes how it *has been* applying risk modeling techniques to its WMP initiatives (*see* Appendix A to this response).

Second, with respect to subpart (ii), SDG&E provided a list of specific risk models that have been informing SDG&E's targeting of mitigations including the RAMP multi-attribute value function (MAVF), Wildfire Risk Reduction Model (WRRM) and the Pole Risk Mitigation Engineering (PRiME) model. SDG&E disagrees with CalPA's statements regarding the sufficiency of the level of detail, such as data sources, methodology, assumptions, *etc.* Those purportedly missing items were not in scope of subpart (ii) as written in Resolution WSD-002. That said, SDG&E offers additional details on its models in Appendix A to this response.

Third, with respect to subpart (iii), SDG&E again interpreted this as a forward-looking requirement. SDG&E thus provided a three-year timeline of how it is evolving its risk modeling capabilities to enhance its ability to prioritize and target initiatives as well as set PSPS thresholds. In addition, SDG&E will be providing a 10-year timeline with annual milestones in its upcoming Quarterly Report response to Guidance-12 that will offer additional details. As such, SDG&E believes its response to Guidance-3 is sufficient.

² Resolution WSD-002, Appendix A, p. A3.

³ POC Comments, p. 4.

⁴ MGRA Comments, p. 2.

⁵ CalPA Comments, pp. 7-8.

⁶ Investigation (I.) 19-11-011, SDG&E RAMP Report (November 27, 2019).

Fourth, with respect to subpart (iv), SDG&E also viewed this as a future-looking requirement. SDG&E thus described its plans to incorporate its Wildfire Next Generation System (WiNGS) as a key improvement to its risk modeling capabilities to inform initiative prioritization and targeting at the segment level as well as informing operational decision-making. SDG&E's response to Guidance-12 will offer additional detail on those plans.

Fifth, with respect to subpart (v), SDG&E again described its forward-looking process to continue to incorporate lessons learned in its risk modeling approaches and highlighted new capabilities in WiNGS to demonstrate how it is incorporating PSPS impacts into its modeling based on feedback received from various stakeholders about the need to evaluate risks of PSPS, while not just looking at it as a mitigation. While SDG&E appreciates concerns raised about WiNGS, it believes that working with stakeholders to share the model and gain insights and inputs is the right step forward as it is in the early stages of development. SDG&E also fully agrees and emphasizes the need to leverage the appropriate forums for these discussions such as the Safety Model Assessment Proceeding (S-MAP) Rulemaking, R.20-07-013.

II. Condition SDGE-13

In Condition SDGE-13, WSD sought better data and analysis with respect to SDG&E's enhanced 25-foot clearances for "at risk species" of trees.⁷ WSD thus directed SDG&E to submit a plan for comparing areas with and without enhanced post trim clearances and for collaborating with the other utilities on how to measure clearance distance impacts.⁸ CalPA deems SDG&E's RCP insufficient to meet this condition and faults SDG&E for allegedly ignoring various findings, and POC makes similar arguments.⁹ SDG&E has complied with this condition and has not ignored applicable requirements.

As an initial matter, it is important to recognize that SDG&E's enhanced trimming is driven by an important safety motivation – avoiding catastrophic wildfires. SDG&E is statutorily obligated to operate safely,¹⁰ which includes taking steps to avoid vegetation contact with its energized facilities. The risk of such fires is real: CAL FIRE has determined that several recent powerline-related wildfires ignited when tree limbs came into contact with electrical equipment.¹¹ SDG&E was deemed imprudent by the Commission in 2017 for failing to prevent the 2007 Rice Fire, in which a tree limb contacted an overhead conductor, igniting a fire.

⁷ Resolution WSD-005, Rev., Appendix A, p. A9.

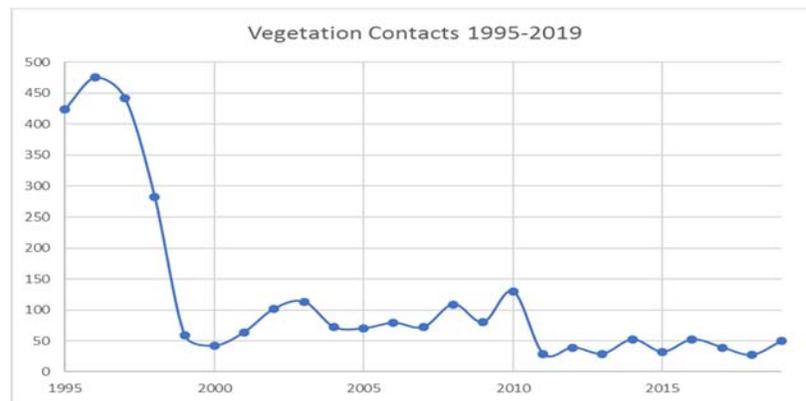
⁸ *Id.*

⁹ CalPA Comments, p. 1; POC Comments, pp. 11-14.

¹⁰ *See, e.g.*, P.U. Code § 451.

¹¹ *See, e.g.*, "CAL FIRE Investigators Determine Cause of Camp Fire," CAL FIRE News Release (May 15, 2019) (attributing a second ignition source to vegetation contact with powerlines); "CAL FIRE Investigators Determine Causes of 12 Wildfires in Mendocino, Humboldt, Butte, Sonoma, Lake, and Napa Counties," CAL FIRE News Release (June 8, 2018) (attributing ignition of Redwood Fire, Cherokee Fire, Norrbom Fire, Adobe Fire, Patrick Fire, Nuns Fire, Pocket Fire, and Atlas Fire to tree limbs contacting powerlines).

While General Order 95 and Public Resources Code Section 4292 specify minimum clearances for utilities to maintain, they do not specify maximum clearances. SDG&E has determined that 25-foot clearances are appropriate in certain limited instances as a result of historical experience with maintaining such clearances on transmission facilities. SDG&E explained this conclusion in detail in its comments on Draft Resolutions WSD-002 and WSD-005. SDG&E reproduces the following chart below which shows (contrary to CalPA's misguided theories that enhanced post trim clearances have no impact or even adverse impacts) the beneficial impact of enhanced clearances.



When SDG&E went beyond minimum regulatory requirements and trimmed the majority of its trees in the system to have clearances between 10-12 feet, vegetation contacts were significantly reduced by an average of 320 faults per year. Using SDG&E's five-year average ignition rate from SDG&E's 2020 WMP Table 11, SDG&E's enhanced clearances reduced 27 ignitions annually as a result of that change, representing an incredible reduction in risk. Given this data, and the fact that regulations exist to ensure that minimum post trim clearances are maintained between vegetation and electric lines, it would be illogical to assume no relationship (and even more illogical to assume an adverse relationship)¹² between increased post trim clearances and vegetation contacts.

Indeed, on SDG&E's transmission system where it maintains clearances between 20' – 30' and greater, SDG&E has had two contacts and 0 ignitions in the last five years.

¹² CalPA's assertion that the "best evidence" regarding the relationship between vegetation clearances and wildfire risk shows that extended clearances may increase risk is wrong. CalPA appears to be confusing vegetation management and fuels management. SDG&E's extended clearance program is attempting to get greater clearance from vegetation (*i.e.*, trees, not native shrubs) that are growing in proximity to the distribution lines. Just to be clear, the native shrubs and bushes already maintain clearances greater than 25' being that they are on the ground and under lines that typically run between 40' and 50' in the air and pose no threat to the powerlines. SDG&E's enhanced clearance program is designed to reduce vegetation contacts by increasing the distance between vegetation and the powerlines. Fewer vegetation contacts mean fewer opportunities for ignitions.

TABLE 11b Transmission: Key Recent Drivers of Ignition Probability, Last 5 Years																				
Incident type by ignition probability driver	Near misses tracked	Number of Incidents per year					Avg % probability of ignition per incident					Ignition per year caused by driver								
		2015	2016	2017	2018	2019	Average	2015	2016	2017	2018	2019	Average	2015	2016	2017	2018	2019	Average	
Contact from object	All types of object contact	Yes	35	34	34	32	18	30.6	11.43%	2.94%	2.94%	15.63%	5.56%	7.84%	4	1	1	5	1	2.4
	Animal contact	Yes	15	5	7	1	6	6.8	20.00%	0.00%	0.00%	100.00%	0.00%	11.76%	3	0	0	1	0	0.8
	Balloon contact	Yes	17	24	24	26	10	20.2	5.88%	0.00%	4.17%	0.00%	10.00%	2.97%	1	0	1	0	1	0.6
	Veg. contact	Yes	1	1	0	0	0	0.4	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0	0	0	0	0	0
	Vehicle contact	Yes	1	3	1	4	1	2	0.00%	0.00%	0.00%	75.00%	0.00%	30.00%	0	0	0	3	0	0.6
	Other	Yes	1	1	2	1	1	1.2	0.00%	100.00%	0.00%	100.00%	0.00%	33.33%	0	1	0	1	0	0.4

Ultimately, stakeholders may be asking whether SDG&E has reached the point of diminishing returns, whether trimming trees from 10’-12’ to 20’-30’ substantially reduces vegetation contacts and therefore ignitions, and whether that reduction is worth the additional vegetation management expense to ratepayers and the visual and environmental impacts to customers associated with tree trims and removals. SDG&E believes that the reduction will be significant, worth the expense, and is in the best interest of the safety of our customers and to the safety of the public in general. SDG&E still averages 40 distribution vegetation contacts a year, and another 3.4 ignitions (*see* SDG&E’s 2020 WMP Table 11). As stated above, with SDG&E’s transmission system, where SDG&E has the right of way widths to maintain post trim clearances of 20’ - 30’ or greater, SDG&E experiences an average 0.4 vegetation contacts a year. While SDG&E does not expect to get to transmission level vegetation contacts due to the number of contacts caused by fall in trees and other non-inventory trees, there is still a significant opportunity to reduce vegetation contacts from 40 per year. Even one such contact can result in a catastrophic wildfire.

Nevertheless, per SDGE-13, SDG&E has collaborated with the other investor owned utilities (IOUs) to develop another way of measuring the effectiveness of post trim clearance. SDG&E and the other utilities developed a simple but valid way of measuring the effectiveness by comparing the annual vegetation contact rate (contacts over total trees trimmed) of the trees trimmed to the enhanced clearance levels relative to the contact rate of the trees that have not.

MGRA stated that the IOUs’ plans to measure the effectiveness of post trim clearance is a positive step and should provide useful data going forward. SDG&E agrees with MGRA on both points. MGRA also recommends more specific tracking of fall in tree data and SDG&E supports this as well. While fall in trees are more difficult to mitigate as they are often out of the right of way and not managed in the vegetation tree inventory, they do have an impact on vegetation contacts and ignitions and that impact should be measured.

But CalPA said the plan lacked detail, is not actionable, and does not provide usable evidence. CalPA went on to list eight questions that were not answered by the plan. SDG&E’s study will address all eight of CalPA’s questions and will do so in a timely manner. SDG&E is planning its first report on the effectiveness of post trim clearances as part of its Quarterly Report to be submitted on September 9, 2020. SDG&E believes this report will meet CalPA’s expectations. SDG&E is willing to confer with CalPA to ensure there are no misunderstandings with how this mitigation impacts wildfire risk.

SDG&E appreciates the opportunity to provide these reply comments on the RCPs and looks forward to working with the Commission and interested stakeholders on these issues.

Respectfully submitted,

/s/ Christopher M. Lyons

Attorney for
San Diego Gas & Electric Company

Appendix A

Additional Detail on SDG&E Risk Models

As described in its RCP, SDG&E leverages various risk models to inform targeting and prioritization efforts for its initiatives. These models are categorized as either enterprise-level or asset-level and include the following three key models:

Application	Model	Status
Enterprise Level	RAMP Multi-Attribute Value Function (MAVF)	Currently applied as approved in the S-MAP and continuing to evolve to incorporate lessons learned
Asset Level	Wildfire Risk Reduction Model (WRRM)	Has been informing targeting and prioritization for hardening programs at the asset-level but is evolving to be incorporated in new asset modeling capabilities being developed as part of SDG&E’s asset management program as well as new models such as WiNGS
	Pole Risk Mitigation Engineering (PRiME)	

The RAMP MAVF

SDG&E uses its MAVF model, which was approved through the settlement agreement in the S-MAP proceeding (D.18-12-014) and implemented for the first time in the SDG&E’s RAMP proceeding (I.19-11-010/-011). The model is used to assess various drivers of risk and quantify the likelihood of a risk occurring and its potential consequences using three attributes: safety (fatalities and injuries), reliability (outages), financial (damages and societal impacts). The model is used to quantify a pre-mitigation risk level as well as a post-mitigation risk level to determine the risk spend efficiency (RSE) of programs and projects proposed by SDG&E. While the MAVF is required to be built once, the CPUC-approved settlement agreement allows the utilities to adjust its MAVF over time. SDG&E plans to continually improve its risk assessments, which will be presented in its next RAMP, due by May 2021.

As described in its RAMP Report Wildfire chapter,¹³ SDG&E models its wildfire risk using the MAVF as follows:

- **Data Gathering:** Historical data was used as a starting point for consideration of likelihoods. Data considered was both from reportable ignitions (since 2014) and from large fire history (since 1970) reported, for example, by CAL FIRE.
- **Changes from Historic Likelihood:** Changes were considered from the historic likelihood of fires. Changes from historic likelihoods are primarily due to: a) system hardening programs, including PSPS, that have been undertaken during the timeframe used (to elaborate, the timeframe used for analysis was between 1970 and 2018, and system hardening programs began in earnest in 2008); b) climate change; c) increased

¹³ <https://www.sdge.com/sites/default/files/regulatory/SDG%26E-1%20Wildfire%20Risk%20FINAL.pdf> at 1-16.

overhead miles relative to previous timeframes; and d) change in vegetation relative to previous timeframes. Because each of these changes are not precisely known, models were used to estimate the actual range of current likelihoods, with 10,000 estimates stored for use in the next step.

- **Modeling of Consequences:** Consequences were also modeled by using historical fires to create or “fit” a probability distribution from large fires considering financial loss. The probability distribution is SDG&E’s estimation of the types of financial losses that may occur if a large utility associated wildfire occurs. The probability distribution is not a precise statistical forecast, but it is a useful estimation for wildfire risk discussions. The probability distribution that is currently used is not permanent and will be modified as new information becomes available.
- **Monte Carlo Simulation:** In Microsoft Excel, Monte Carlo modeling was performed to identify the likelihood and consequence of large fires by running tens of thousands of simulations.
- **Meeting the S-MAP Settlement Agreement Decision’s Requirements:** For the RAMP Report to meet the requirements of the S-MAP Settlement Agreement (SA) Decision, aspects of the Monte Carlo output were utilized. Because the scope of the Wildfire risk in the RAMP Report includes all CPUC-reportable fires, and not solely large destructive fires, an adjustment was made from the other internal modeling to calculate the Likelihood of Risk Event (LoRE) based on the recent history of SDG&E’s CPUC reportable fires. Consequence of Risk Event (CoRE) was partially calculated from the Monte Carlo modeling by extracting the expected values of the output consequences.

To determine effectiveness of mitigations using the MAVF, SDG&E assesses initiatives taking into account their scope, where they would be implemented and the lifetime of the projects during which the benefits of risk reduction would be realized to estimate a potential reduction in either the likelihood of ignitions or consequence of ignitions. Once an estimate is calculated, SDG&E then recalculates a new risk score (the post-mitigation risk score) following the same steps above with the new likelihood and consequence values. It then subtracts the post-mitigation risk score from the pre-mitigation risk score, multiplies it by the lifetime of the project and divides it by the total cost to obtain the RSE scores.

Wildfire Risk Reduction Model

WRRM is the primary model that informs the implementation of SDG&E’s Fire Risk Mitigation (FiRM) program which targets overhead distribution, fire-hardening, and rebuilding effort. The goal of FiRM is to fire-harden facilities in the high fire threat district (HFTD) by replacing aged line elements, utilizing advanced technology, and designing for known local weather conditions. Prioritization and scoping of each FiRM project is driven largely by analysis using SDG&E’s WRRM.¹⁴

WRRM is a probabilistic computer model that can perform nearly 70 million fire behavior simulations. It conducts a risk assessment at every pole, using that pole’s characteristics and

¹⁴ <https://www.sdge.com/sites/default/files/regulatory/SDG%26E-1%20Wildfire%20Risk%20FINAL.pdf> at 1-34.

environmental conditions. WRRM utilizes the following as a quantitative approach to risk management:

- Failure rates (before and after hardening);
- Change of ignition;
- Environmental conditions;
- Fire behavior;
- Consequence; and
- Cost of hardening project.¹⁵

Factors considered in the prioritization and scoping process include, but are not limited to, recent occurrences of a “wire-down,” wind and weather conditions, fire risks, outage history, conductor size and type, condition of equipment, environmental conditions, and resulting customer impacts. FiRM projects are scoped on a circuit-by-circuit basis by considering various risk factors. Risk mitigation methods include replacement or removal of small conductor and older wood poles, and employing targeted fire risk mitigation methods of the circuit, including removal of equipment, long span remediation or reinforcement, and advanced technology implementation (namely, falling conductor protection, synchrophasor/phasor measurement unit (PMU) enabled relaying/monitoring, high impedance fault detection, and light imaging detection and ranging (LiDAR) survey data captured via Unmanned Aerial Vehicles (UAVs and helicopters) before and after construction.¹⁶

Pole Risk Mitigation and Engineering

SDG&E’s PRiME program was developed to assess pole strength and integrity considering loading conditions, third party attachments, localized weather conditions, and remaining pole strength throughout SDG&E’s service territory. PRiME does not overlap with existing programs, such as FiRM.¹⁷ Prioritization of PRiME projects is largely driven by a risk model that considers many factors to identify pole failure risk potential including locally known conditions (wind), age of pole, intrusive inspection data, un-guyed structures, conductor size/type, load of Communications Infrastructure Providers, and conductor size.¹⁸ The second component to the prioritization of projects is to identify the fire risk at each pole location and batch work together for fire hardening.

¹⁵ https://www.sdge.com/sites/default/files/SDGE-1_RAMP_Wildfires_Caused_by_SDG%2526E_Equipment_FINAL.pdf

¹⁶ <https://www.sdge.com/sites/default/files/regulatory/SDG%26E-1%20Wildfire%20Risk%20FINAL.pdf> at 1-35.

¹⁷ <https://www.sdge.com/sites/default/files/regulatory/SDG%26E-1%20Wildfire%20Risk%20FINAL.pdf> at 1-36.

¹⁸ <https://www.sdge.com/sites/default/files/SDG%2526E-15%2520Direct%2520Testimony%2520of%2520William%2520Speer%2520-%2520Electric%2520Distribution%2520-%2520O%2526M.pdf> at WHS-26.