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

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| Application of Southern California Gas Company (U904G) to Submit Its 2025 Risk Assessment and Mitigation Phase Report. | Application A.25-05-010 (Filed May 15, 2025) |
| Application of San Diego Gas & Electric Company (U 902 M) to Submit Its 2025 Risk Assessment and Mitigation Phase Report. | Application A.25-05-013 (Filed May 15, 2025) |

# MUSSEY GRADE ROAD ALLIANCE COMMENTS

# ON THE 2025 SAN DIEGO GAS AND ELECTRIC COMPANY RAMP AND

# SAFETY POLICY DIVISION REPORT

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## 1. INTRODUCTION

Pursuant to the Scoping Memo issued on August 11, 2025,[1] the Mussey Grade Road Alliance (MGRA) files and serves these comments on the Sempra RAMP[2] and SPD Report[3]. MGRA's findings and analysis largely support those of SPD, and additionally identify other issues that should be addressed in this proceeding and in SDG&E's General Rate Case filing.

MGRA's Comments address three main issues. First, the SPD Report itself is reviewed. MGRA concurs with many of SPD's conclusions and observations, some of which were raised in MGRA's SDG&E 2026-2028 WMP Comments. MGRA Comments then address a number of issues that were not included in SPD's Report, but which should be addressed by SDG&E in its GRC. Finally, MGRA will discuss process issues raised by the novel approach adopted in this RAMP and discusses available remedies for these issues.

These comments have been prepared by MGRA's expert witness Joseph W. Mitchell, Ph.D.

## 2. HISTORY

Since the development of the RAMP process in the S-MAP proceeding and subsequent Risk-based Decision-making Framework (RDF) proceeding R.20-07-013, there have been a number of IOU GRC cycles that have issued RAMP filings that were reviewed by SPD, Cal Advocates, and intervenors. These include PG&E (2020), Sempra (2021), SCE (2022), and PG&E (2024). The process that was developed over the course of several years adapted to the need for the Safety Policy Division to do a thorough evaluation of the RAMP application, usually requesting additional time, and providing an opportunity for intervenors to provide informal input to SPD prior to its report, which SPD would include in its report and also use in its evaluation. In these earlier proceedings, intervenor formal comments were therefore secondary and the time required to prepare

[1] A.25-05-010/13; ASSIGNED COMMISSIONER'S SCOPING MEMO AND RULING; August 11, 2025.
[2] A.25-05-013/13; Sempra; 2025 Risk Assessment Mitigation Phase; May 15, 2025.
[3] Safety Policy Division Evaluation Report on Sempra's 2025 RAMP Applications (A.)25-05-10 [sic]; October 10, 2025.

them was reduced in order to help maintain the GRC schedule.[4] Early service of intervenor comments also provided utilities additional time to prepare formal responses within the scope of the RAMP proceeding.

Additionally, SDG&E submitted a triannual Wildfire Mitigation Plan (2026-2028) this spring,[5] immediately prior to SDG&E's RAMP filing describing its risk methodology and wildfire risk mitigation planning in considerable detail. SDG&E's WMP was released a month before the RAMP filing, and consequently, much of it is technically relevant for the current RAMP. MGRA was an active participant in that review, issuing data request and providing technical comment.[6]

SDG&E filed its RAMP on May 15, 2025. MGRA filed its protest on June 18, 2025.[7] On June 19, 2025, Administrative Law Judge Gruendling issued a ruling consolidating proceedings and requiring prehearing conference statements. Parties met and conferred, issuing a Joint Prehearing Conference statement on July 7, 2025. A prehearing conference was held on July 23, 2025.

At the prehearing conference, MGRA's representative Joseph Mitchell stated that intervenors had met and conferred with SPD prior to the PHC and had confirmed that the dates for the report and informal comments requested in the Cal Advocates' proposed schedule were reasonable. Mitchell also stated that SPD Staff "*do very much appreciate the informal comments as input. Historically those have often been incorporated into the SPD comments; and when those are combined, much more frequently affect substantive improvements in the utility GRC filings*."[8]

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[4] A.25-05-010-13; JOINT PREHEARING CONFERENCE STATEMENT; July 7, 2025; p. 7. (Joint PHC Statement) Shows schedule for previous three RAMP proceedings.
[5] OEIS Docket 2026-2028 WMPs; 2026–2028; SDG&E; Wildfire Mitigation Base Plan; May 2, 2025. https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=58389&shareable=true (SDG&E WMP R0)
[6] OEIS Docket 2026-2028 WMPs; 2026–2028; MUSSEY GRADE ROAD ALLIANCE COMMENTS ON THE 2026 TO 2028 UPDATE OF THE WILDFIRE MITIGATION PLANS OF SDG&E; June 13, 2025. https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=58684&shareable=true (MGRA WMP Comments)
[7] A.25-05-013; MUSSEY GRADE ROAD ALLIANCE PROTEST TO SAN DIEGO GAS AND ELECTRIC COMPANY 2025 RISK ASSESSMENT MITIGATION PHASE APPLICATION; June 18, 2025. (MGRA Protest)
[8] Transcript at p. 46.

The Scoping Memo[9] was issued on August 11, 2025. The Scoping Memo adopted a shorter schedule as argued by Sempra and thereby reduced the SPD review period and opportunity for intervenors to file substantive informal comments and have them included in SPD's Report.

Nevertheless, SPD indicated that it would review early-received informal comments from intervenors, though due to the short notice these lacked substantive analysis and data request support. It also stated that intervenor informal comments would no longer be appended to the SPD Report. MGRA served its informal comments on August 22, 2025. MGRA's informal comments were based largely upon its WMP Comments.

During this period, the Office of Energy Infrastructure Safety rejected SDG&E's original Wildfire Mitigation Plan on June 24, 2025.[10] SDG&E re-filed the R1 revision of its WMP on July 18, 2025.[11] MGRA filed additional comments on SDG&E's revision on August 4, 2025, taking the position that SDG&E's R1 WMP revision should also be rejected as insufficient.[12]

SPD filed its Report on October 10, 2025.

## 3. DISCUSSION AND STRUCTURE OF COMMENTS

The purpose of the RAMP proceeding is to ensure that safety risks are identified across the enterprise so that mitigations can be properly funded in the subsequent GRC proceeding. To ensure that the utility's self-assessment of risks is accurate, the Commission allows review of the RAMP by the Safety Policy Division and parties to the proceeding. The RAMP is an unusual proceeding in that its deliverable comprises reports and comments, and usually no actionable Decision is made prior to the RAMP being used as inputs to the GRC. The utility is required to address and respond

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[9] A.25-05-010-13; ASSIGNED COMMISSIONER'S SCOPING MEMO AND RULING; August 11, 2025. (Scoping Memo)

[10] Docket 2026-2028-BASE-WMPS; Rejection and Resubmit Order for the San Diego Gas & Electric Company 2026-2028 Base Wildfire Mitigation Plan; June 24, 2025. (OEIS Rejection)
https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=58774&shareable=true

[11] Docket 2026-2028-BASE-WMPS; SDG&E; Wildfire Mitigation Base Plan; version R1; July 18, 2025. (SDG&E WMP)
https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=58946&shareable=true

[12] Docket 2026-2028-BASE-WMPS; MUSSEY GRADE ROAD ALLIANCE COMMENTS ON THE R1 REVISION OF THE 2026 TO 2028 UPDATE OF THE WILDFIRE MITIGATION PLANS OF SDG&E; August 4, 2025. (MGRA WMP R1 Comments)
https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=59121&shareable=true

to comments raised by SPD and parties in the RAMP proceeding but not necessarily to implement them, and as a result SPD and intervenor input is sometimes given short shrift. The Commission's treatment of the RAMP in the GRC generally consists of a few lines, if that, acknowledging that the RAMP Process has been followed. The cases where RAMPs have risen above pro-forma exercises occur when utilities accepted suggestions coming out of the RAMP proceedings voluntarily and when rulings post-RAMP have required additional information to be provided in the GRC filing. Hence, the present comments will be poised as recommendations for next spring's Sempra GRC filing, and these comments seeks an additional ruling supporting that MGRA recommendations be analyzed in the GRC.

In previous RAMP proceedings, substantive intervenor work appeared in the informal comments which were then entered into the record as an attachment to the SPD Report. As this mechanism is not available in the current proceeding, other mechanisms need to be employed. First, MGRA's informal comments to SPD have been attached as Appendix A to this filing. As noted earlier, these largely drew from MGRA's filings in its 2026-2028 WMP review. Secondly, data requests responses from SDG&E received after MGRA's informal comment filings are attached as Appendix B. Finally, data and analysis included from MGRA's WMP review and related SDG&E data request responses will be included as extended quotations in the body of these Comments (partially explaining their length).

The comments themselves are organized in three parts. The first section is comment on the SPD Report. The second section address the SDG&E RAMP itself and SDG&E's data request responses. Finally, procedural issues arising from the novel approach to the RAMP comments taken in the scoping memo will be raised and recommendations for addressing these issues in a subsequent ruling will be made.

Analysis workpapers based on SDG&E RAMP data request responses can be found at: https://github.com/jwmitchell/Workpapers/SDGERAMP25/

Analysis workpapers by MGRA created for the WMPs are available online at: https://github.com/jwmitchell/Workpapers/WMP26

## 4. SAFETY POLICY DIVISION REPORT

MGRA largely supports Safety Policy Division's Sempra RAMP evaluation report and finds that staff did a commendable job of reviewing a complex document on an accelerated timeline. To the extent that similar areas were studied by SPD and MGRA no significant conflicts between the analyses were found. SPD cited to a number of sources in MGRA WMP comments, further expanding on MGRA observations and findings. Areas meriting particular attention are listed in the following subsections:

### 4.1. Sempra's Alternative Tranching Methodology

The SPD Report notes that:

"*Phase 3 establishes quintiles of LoRE and quintiles of CoRE (5×5) as the default best practice, producing 25 tranches. In 2025, Sempra deviated from this default by submitting a Tranching White Paper on November 1, 2024, proposing a Homogeneous Tranching Methodology. This represents the first instance of a utility formally testing an alternative to the quintile approach.*"[13]

SPD is not fully swayed by Sempra's approach:

"*On balance, SPD does not conclude that the alternative is categorically superior to the default quintile method*."[14]

In fact, SPD conducts a detailed analysis of SDG&E's use of its alternative tranching method compared to risk scores and while "*when segments are sorted by descending risk score values within each class (e.g., HFTD Tier 3), the HTM ranking (tranche assignment) generally aligns with the actual risk score values, demonstrating a strong correlation between the risk scores and the HTM's tranche assignment within that class*..."[15] this does not generalize and that "*SDG&E's HTM is ineffective at creating consistently homogeneous risk tranches or homogeneous CoRE/LoRE tranches when applied across all classes*."[16]

[13] SPD Report; p. 13.
[14] Id.; p. 20.
[15] Id.; p. 108.
[16] Id.; p. 110.

The original assessment made in MGRA's WMP Comments was guardedly positive on SDG&E's HTM tranching approach, for the specific reason that HTM provides an ordinal ranking, so that lower-numbered tranches generally have higher risk than higher-numbered tranches.[17] Nevertheless, SPD's work is convincing and indicates that SDG&E's HTM methodology is not meeting the goal of creating homogenous risk tranches. Rather than abandon HTM and restrict itself to the 5 X 5 risk tranches, SDG&E should improve its HTM model to address inconsistencies noted by SPD.

The usefulness of the HTM tranches for specific analyses is demonstrated below. This work, taken from MGRA's WMP R1 Comments, shows how SDG&E has assigned undergrounding mitigation to higher risk tranches in its upcoming and ongoing mitigation work, explaining partly its claim that undergrounding addresses a significantly more risk than covered conductor. The figure below shows the number of segments per HTM risk tranche, indicating which have been selected for undergrounding and which for covered conductor:

[17] MGRA SDG&E WMP R1 Comments; pp. 6-10.

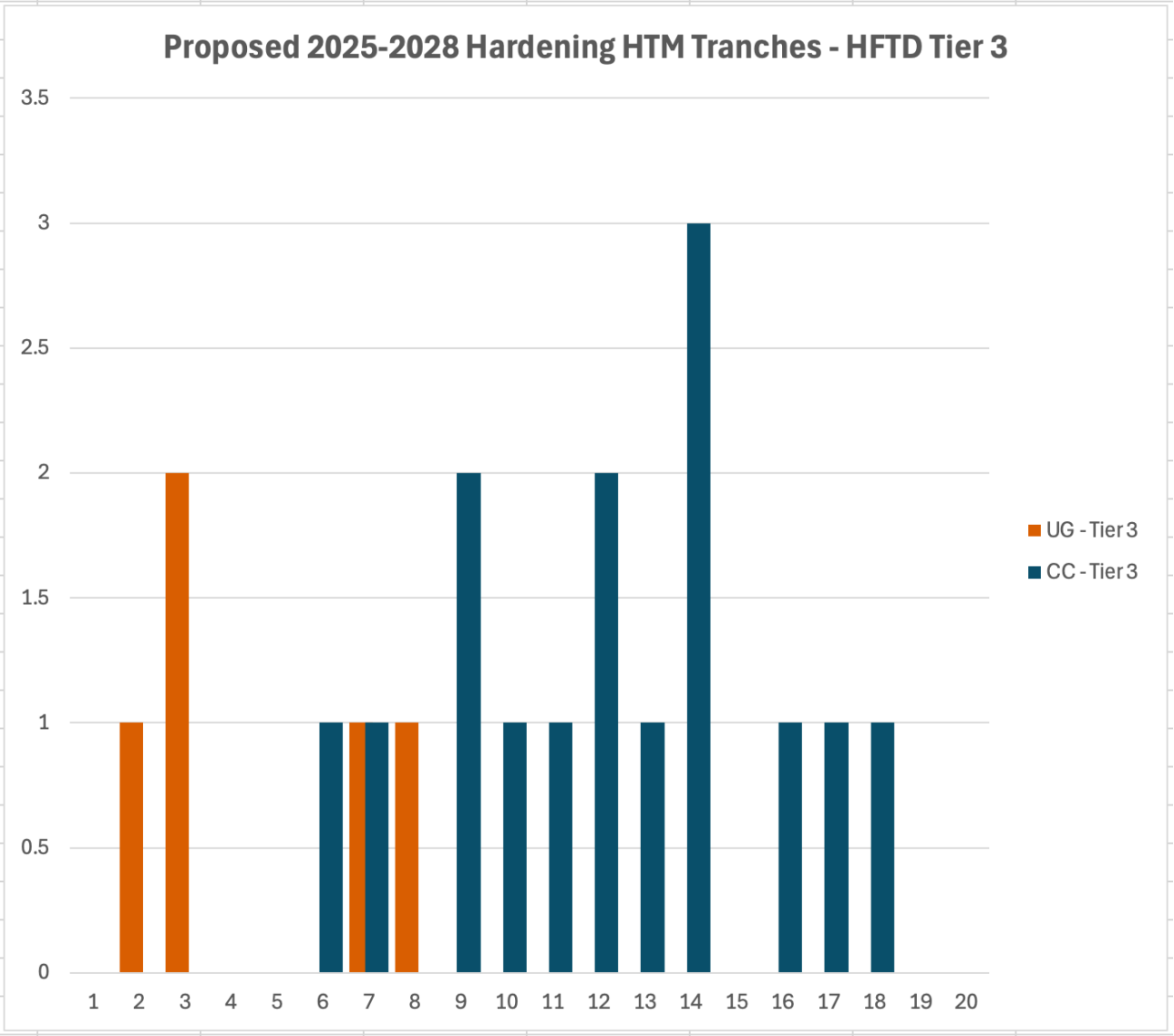


**Figure 1 -** Count of circuit segments proposed for hardening mitigation in SDG&E's Appendix G in each HTM tranche for HFTD Tier 3.[18]

It is clear from this plot that many circuit segments from low-risk circuit segments are being mitigated by SDG&E's hardening program, which led MGRA to infer that SDG&E may be holding circuits in reserve for its SB 884 undergrounding program.

In its data request responses to SPD, SDG&E admitted that tranching "*doesn't necessarily drive the decision-making process for wildfire and PSPS grid hardening investment*."[19] To which

[18] MGRA WMP R1 Comments; p. 8. Cites:
Workpaper SDG&E_2026-2028_Base-WMP_Appendix G Supporting Data_R1-jwm.xlsx; Tab HTM Tranche.
[19] SPD Report; p. 112.

SPD states: "*This response is consistent with SPD findings that SDG&E's tranching methodology is poorly correlated with its mitigation selection. SPD's observation is also aligned with Mussey Grade Road Alliance's (MGRA) comment that 'SDG&E is leaving a remarkable amount of risk "on the table" by choosing to mitigate lower-ranked risk circuits in the 2026-2028 timeframe there is little evidence that SDG&E is using calculated risk as a primary motivation for its hardening priorities*.'"[20]

**Recommendations:**

- SDG&E should revise and improve its HTM tranching methodology to address the issues that SPD raised regarding inhomogeneous risk per tranche and should provide these improved HTM tranching estimates regardless of whether it also includes the traditional LoRE X CoRE risk tranches.

## 4.2. Risk Scaling

### 4.2.1. SPD Assessment of Risk Scaling and MGRA WMP Comments

SDG&E has adopted a "convex" non-linear scaling function to adjust its calculated risk values. SPD's report expresses concern about SDG&E's approach to risk scaling, pointing out numerous examples of risk multipliers being as high as 12-fold for 99$^{th}$ percentile risks.[21] SPD presents another example of risk values from SDG&E's workpapers showing an increase from $476 M to $3,021 M.[22] SPD emphasizes that "*if a utility applies risk scaling in its CBR calculations, it must also present the unscaled (neutral) CBR values and unscaled related risk elements*."[23]

SPD performs an analysis of calculated risk values versus calculated scaling factor and determines that "*implied risk scaling effect values are also poorly correlated to CoRE values and start CoRE neutral. Figures 7-7 and 7-8 together indicate that SDG&E's scaling function does not exhibit a meaningful correlation with either unscaled risk or unscaled CoRE of segments. The*

[20] SPD Report; p. 114. Cites: MGRA WMP R1 Comments; p. 12.
[21] SPD Report; p. 123.
[22] Id.; p. 122.
[23] Id.

*scaling function appears to have been applied inconsistently, raising concerns about the integrity of risk prioritization and the validity of SDG&E's CBR calculations*."[24]

SPD also expresses concern that SDG&E's "*Bernoulli-style Monte Carlo simulation does not adequately portray the full distribution of CoRE outcomes which is required to identify or prioritize 'black swan' scenarios: rare but catastrophic events with outsized consequences. By representing the potential range of outcomes with one expected value, information about possibly extreme events is not available to inform mitigation decisions*."[25]

MGRA also provided extensive criticism of SDG&E's scaling function in its WMP and informal RAMP comments, as discussed below. However, SPD's identification of the issues highlighted above extends beyond MGRA's analysis and should be emphasized. One implication of SPD's analysis that SPD did not mention and which is highly relevant to a general rate case is that an asymmetric error in the choosing mitigation is a ratchet mechanism that will increase ratepayer costs over time as the errors are identified and corrected. In simple terms: if the CBR is artificially inflated due to a statistical fluctuation or erroneous calculation, it means that segments that may not have warranted priority would be hardened (particularly with undergrounding, as shown in Figure 1). Once the money is spent on undergrounding it will not be refunded to ratepayers. Subsequent analysis with different results (either from additional statistical fluctuations, improvements in the calculation, or a change to the risk scaling function) would cause higher risk circuit segments to be identified, which might in fact merit hardening and additional spending. Hence there is no financial incentive for highly accurate calculations, and inaccuracies and more importantly variability over time work in the company's favor. There is no implied claim that inaccuracies are intentional, however this observation reinforces the requirement that mitigation choices and priorities be based on accurate risk calculations.

SPD quoted an MGRA result from its R1 comments regarding the imputed losses from the Eaton fire that would have been calculated using its scaling function. There are two errors in this result. Most importantly the MGRA result was erroneous, stating a $128 trillion cost,[26] whereas the correct scaling provided in SDG&E's reply is $210 billion. This is still a 20-fold increase over the

[24] Id.; p. 126.
[25] Id.; p. 129.
[26] SPD Report; p. 130.

imputed financial risk of a wildfire with 10,000 home losses (10,000 X $ 1 M = $10 B).[27] Additionally, SPD cites the erroneous number to MGRA's Informal Comments, however MGRA had already identified the error in its Informal Comments and noted SDG&E's correction.[28]

Typical risk inflation due to SDG&E's "convex scaling" becomes greater as the loss increases, but typically increases risk for segments in high fire areas by about a factor of 6 to 8. While SPD notes the papers that SDG&E cites as justification for its risk scaling function and its process for determining a power law exponent, SPD fails to dig deeper into the math and logic of SDG&E's approach to see whether SDG&E is at all consistent with the papers it cites or with current best practice. In fact, SDG&E fails to provide adequate documentation supporting its risk aversion function at several levels:

- The sources cited by SDG&E in determining its risk aversion function are applied only to fatalities and risk to human life. There is no risk aversion approach cited for property loss, or any documented evidence that the same risk aversion function can be applied to financial or reliability risk as to safety risk.

- The concept of "risk aversion" – that people are willing to pay more to avoid a more catastrophic event than smaller events doing the same damage – is not universally accepted.

MGRA's analysis of this issue in its 2026-2028 SDG&E WMP Comments was extensive, and relied on SDG&E's RAMP filing, since risk scaling was not described in detail in SDG&E's WMP. SDG&E's response to MGRA's analysis primarily consisted of falsely characterizing MGRA as biased opponents of undergrounding. MGRA's analysis remains valid and relevant to the RAMP proceeding and the subsequent GRC. Relevant portions are quoted verbatim in the following subsection.

[27] Appendix A; MGRA Informal Comments; pp. 6, 7. Cites:
SDG&E WMP R1 Reply Comments; p. 6.
[28] MGRA Informal Comments; p. 6.

### 4.2.2. *MGRA 2026-2028 SDG&E WMP Comments on Risk Scaling (5.1)*

p. 13-14:

*SDG&E's methodology uses a power law function derived from f—N curves (fatalities versus frequency) obtained from literature, which it then applies as a multiplier if the number of fatalities is greater than a threshold. The SDG&E scaling function is described by:*

$$f(x) = \begin{cases} x & 0 \le x < 1 \\ x^{\alpha} & x \ge 1 \end{cases}$$

*where $\alpha$ = -1.47, and x is the number of what SDG&E calls "equivalent fatalities", which will be discussed in depth below. SDG&E's WMP explains that "this function converts the number of fatalities associated with an event into an adjusted figure that reflects SDG&E's risk aversion towards catastrophic events."[29] SDG&E's determination of the exponent is derived as an average from two sources that study risk tolerance attitudes in different industries and natural catastrophes.*

*As shown in Figure 5-7, this "Risk Aversion Function" causes a dramatic increase in SDG&E's scaled risk as baseline risk increases.*

Figure 5-7: SDG&E Convex Risk Aversion Function

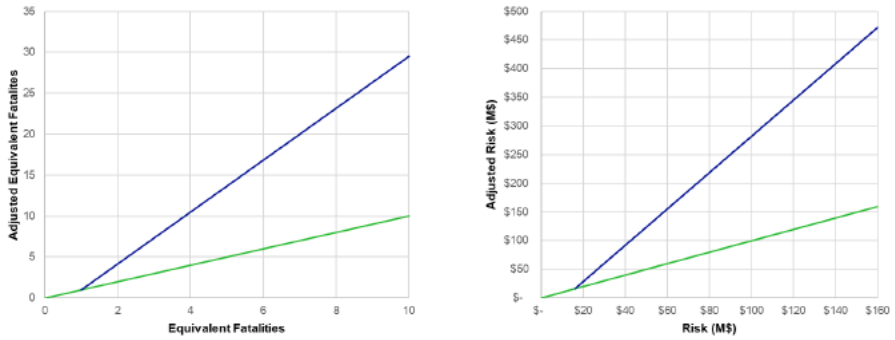


**Figure 2 -** *SDG&E's Figure 5-7, showing its "Risk Aversion Function" in terms of what it calls "equivalent fatalities" and calculated risk in $M.* ***(Figure 1 in MGRA WMP Comments)***

*This leads SDG&E's estimated losses to be as high as $52B (P99) or even $211B (P100), as shown in its Table 5-7. This sounds implausible, and in fact is, so Energy Safety needs to carefully examine the basis of SDG&E's approach.*

p. 15:

[29] SDG&E WMP p. 41.

*Nevertheless, the companies are allowed to use risk scaling. For Energy Safety to adopt these estimates over neutral risk scaling, however, this use needs to be adequately justified. SDG&E cites Griesmeyer, et. al, 1980 (fn 35) to state that this is an "*outcome that aligns with societal preferences*."*[30]

*Griesmeyer et. al describe the general principle of risk aversion:*

*"*Societal values have frequently been assessed using recorded accident statistics on a wide range of human activities assuming that the statistics in some way reflect societal preferences, or by surveys concerning perceptions and evaluations of risk.

Both methods indicate a societal aversion to risk e.g., many small accidents killing a total a of 100 people are preferred over one large accident in which 100 lives are lost*."*

*It is important to note that Griesmeyer's work was done in 1980, and considerable work has been done in risk management since then. A literature search reveals that acceptance risk aversion and the use of f-N curves is by no means universal. Rheinberger and Treich, 2017,*[31] *provide a superb overview of the topic, describing the rapid increase in publications referring to disasters and catastrophes, and discuss many topics now familiar to California utilities, regulators, and stakeholders: catastrophes, tail-risk, f-N curves, ALARP, and risk aversion. The paper reviews the results of numerous studies that have attempted to gauge societal attitudes toward risk and finds that, surprisingly, the majority of studies have found "catastrophe acceptance" to be more prevalent that "catastrophe aversion", and concludes that: "*It is not clear whether we are, nor whether we should be, catastrophe averse*."*

p. 16:

*They utility's motivation for adopting a risk-averse attitude is obvious: it resolves every issue that the utility has regarding wildfire and regulation, and additionally allows it to make additional profits. And as SDG&E's own language shows, they do a quick bait and switch, arguing first that risk aversion "*aligns with societal preferences*" and then stating that its risk aversion function converts risk values to "*an adjusted figure that reflects SDG&E's risk aversion towards

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[30] SDG&E 2025 RAMP-3-23.
Griesmeyer, J.M., Simpson, M., Okrent, D., 1980. Use of risk aversion in risk acceptance criteria (No. ALO-83; UCLA-ENG-7970). California Univ., Los Angeles (USA). Dept. of Chemical, Nuclear, and Thermal Engineering. https://doi.org/10.2172/5230500

[31] Rheinberger, C.M., Treich, N., 2017. Attitudes Toward Catastrophe. Environ Resource Econ 67, 609–636. https://doi.org/10.1007/s10640-016-0033-3

catastrophic events*". SDG&E's attitude toward risk aversion is not necessarily society's attitude toward risk aversion. Should the regulators, the CPUC and OEIS adopt risk aversion? The CPUC's motivation for allowing utilities to use it was apparently to allow another mechanism for incorporating uncertainty and tail risk. SDG&E and PG&E, however, are purportedly using it to impute an aversion to catastrophic events. Should OEIS give this model any credence or adopt it itself?*

*While SDG&E has provided reasonable regulatory and academic support for its risk aversion function, examining how it is used in practice reveals that it goes badly wrong in the details, and in fact generates absurd (though self-serving) results.*

*Noting that a loss of $210 B dollars seems extraordinarily high given the size and makeup of SDG&E's service area, SDG&E was asked to provide additional detail regarding this number. It responded that: "*Over the course of the 5 million simulated years, the most extreme wildfire scenario, resulting in an estimated cost of approximately $211 billion, was driven by two ignition events that coincidentally occurred under the same simulation seed ID*," and provides the following detail regarding these events:*

p. 17:

| | **Ignition 1** | **Ignition 2** | **Total** |
|---|---|---|---|
| Sim Weather Conditions Date | 11/12/2018 | 11/17/204 | |
| Total Acres Burned | 43,703 | 35,934 | 79,637 |
| Total Structures Destroyed | 6,029 | 4,042 | 10,071 |
| Wildfire Total Risk (with Risk Aversion) $M | $136,729.33 | $74,237.73 | $210,967.06 |
| Wildfire Total Risk (without Risk Aversion) $M | $7,559.78 | $4,989.72 | $12,549.50 |
| Wildfire Safety Risk (without Risk Aversion) $M | $1,427.77 | $863.42 | $2,291.19 |
| Wildfire Financial Risk (without Risk Aversion) $M | $6,132.00 | $4,126.24 | $10,258.25 |
| Wildfire Total Risk (with Risk Aversion) $M | $0.01 | $0.05 | $0.06 |

**Table 1-** SDG&E's two "worst case" Monte Carlo events shown in DRR MGRA-2026-8-3-Q4. Risk averse score can be seen to be roughly 7-10X the size of the total safety, financial, and reliability risk.

*What is odd about the SDG&E estimation is how much larger the "risk averse" estimated risk is than the estimates of safety, reliability, and financial risk without "risk aversion" applied, with SDG&E's total risk averse estimate being nearly 100X larger than its uncorrected wildfire safety risk. SDG&E explains its method for getting a correction of this magnitude:*

*"*Note that any monetized CoRE will first transform into equivalent fatalities using Equation 3.8, then be scaled by Equation 3.7, and finally be transformed back to monetized scaled CoRE… Consistent with the Commission's shift to monetization in the Phase 2 Decision, SoCalGas and SDG&E's adoption of Equation 3.10 produces a consistent implied threshold for Safety, Reliability, and Financial attributes. Specifically, the Companies apply the risk scaling factor on a trial-by-trial basis to each CoRE attribute, starting at the monetized equivalent of the VSL dollar value for one fatality.*"*[32]

*SDG&E's Equation 10 is defined:*

p. 18:

$$g(x) = \frac{x}{VSL} \qquad 3.8$$

$$g^{-1}(x) = VSL \cdot x \qquad 3.9$$

$$s(x) = g^{-1} \circ f \circ g(x) = g^{-1}\left(f(g(x))\right) \qquad 3.10$$

*where x is the loss, and VSL is the DOT value of Statistical Life (currently $16.2 M).*

*Effectively SDG&E is stating that the societal preference – or at least SDG&E's preference – aversion to catastrophic loss of life translates directly to aversion to "catastrophic" loss of money, which by SDG&E's definition is anything over the Department of Transportation Value of Statistical Life, or $16.2 M. SDG&E's methodology stands every principle of cost/benefit analysis and risk aversion as defined in the references and in the regulatory record on its head. The whole idea of catastrophic risk aversion, whether one accepts it or not, is to decouple the value of human life from the cold logic of cost/benefit analysis, to say that the societal impact of a mass casualty event is worse than the impact of an equal number of fatalities that occur for more mundane*

[32] Op. Cite; p. RAMP-3-27.

*reasons. For SDG&E to then conclude that if society is willing to spend an amount of money that grows exponentially with the number of casualties it is therefore willing to spend an amount of money that grows exponentially with amount of money at risk makes no sense from an economic or ethical point of view. It is in fact an example of a classic "affirming the consequent" logical error.*[33] *The absurdity of this approach is apparent in* Table 1 *which shows the total estimated risk reaching nearly 100X the safety risk. Even from an economic standpoint, the SDG&E estimate implies a societal catastrophe aversion that would be willing, for CBR of 1.0, to spend 17X the amount of the potential loss for a mitigation. It is also important to note that until the recent CPUC decision setting VSL, SDG&E and other utilities were using $100 M as the effective VSL to account for this risk aversion,*[34] *indicating utilities in fact supported the idea of differentiating losses from fatalities from other wildfire costs and preferentially increasing safety risk.*

pp. 18-19:

*It might be argued that in fact society does spend more than potential loss for insurance against catastrophic loss, such as spending for homeowners insurance. This example provides a good comparison. A homeowner might be required to spend ~1% of their home value per year to provide insurance in a wildfire area. SDG&E's estimates for unscaled and scaled wildfire and PSPS enterprise risk in its RAMP are $467 M and $3,021 M,*[35] *respectively, a factor of 6.5, or a risk premium of 550%. Assuming this was mitigated at CBR=1.0, with an amortization period of 50 years, this yields an effective annual premium of 4%/year. In fact, is unlikely that wildfire mitigation costs will be amortized over 50 years. More likely, ratepayers will need to pay it in 10 years or less, which would result in an annual risk premium of 21% of dollars-at-risk. And whose risk? While some wildfire loss costs may be passed on to ratepayers through various mechanisms into higher rates, it is SDG&E's shareholders that would be most affected. So this is not a "societal" preference, it is an SDG&E preference, and it represents an economic choice, and not a safety choice, and therefore is outside of Energy Safety's mandate, and Energy Safety should therefore look strictly at risk-neutral scaling."*

p. 20:

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[33] https://en.wikipedia.org/wiki/Affirming_the_consequent

[34] See MUSSEY GRADE ROAD ALLIANCE COMMENTS ON 2022 WILDFIRE MITIGATION PLANS OF PG&E, SCE, AND SDG&E; p. 296/332. Cites;
MGRA Informal Comments on SDG&E 2020 RAMP, DRR MGRA-DR-003-Q7.

[35] RAMP-01-11; Table 4.

*The CPUC has indicated that risk-averse scaling is permissible assuming risk-neutral calculations are provided as well, but the basic assumption made by all stakeholders until SDG&E's WMP and RAMP filings was that risk aversion was intended to address uncertainty, aversion to mass casualties, and otherwise unmanageable tail-risk estimates. For wildfire tail-risk calculation, risk-aversion is unnecessary and redundant because extreme loss cases are automatically created by 24 hour wildfire spread modeling and truncated power law loss estimates. If Energy Safety wishes to support a mass-casualty averse attitude, it can do so by requiring SDG&E's use of risk aversion to apply this scaling ONLY to its safety attribute. This would still incorporate a societal or regulatory risk-averse attitude but would have a smaller effect on the overall result. This is demonstrated in the table below, in which MGRA re-calculates the values in* Table 1 *applying SDG&E's scaling function only to its safety attribute:*

| | **Ignition 1** | **Ignition 2** | **Total** |
|---|---|---|---|
| Sim Weather Conditions Date | 11/12/18 | 11/17/14 | |
| Total Acres Burned | 43,703 | 35,934 | 79,637 |
| Total Structures Destroyed | 6,029 | 4,042 | 10,071 |
| Wildfire Total Risk (with Risk Aversion) $M | $136,729.33 | $74,237.73 | $210,967.06 |
| Wildfire Total Risk (without Risk Aversion) $M | $7,559.78 | $4,989.72 | $12,549.50 |
| Wildfire Safety Risk (without Risk Aversion) $M | $1,427.77 | $863.42 | $2,291.19 |
| Wildfire Financial Risk (without Risk Aversion) $M | $6,132.00 | $4,126.24 | $10,258.25 |
| Wildfire Reliability Risk (without Risk Aversion) $M | $0.01 | $0.05 | $0.06 |
| Wildfire Total Risk (without Risk Aversion) $M | $15,119.55 | $9,979.38 | $25,098.93 |
| Estimated number of fatalities | 44 | 27 | 71 |
| Estimated number of serious injuries | 176 | 107 | 283 |
| SDG&E Risk Averse equivalent fatalities | 261 | 426 | 688 |

| | | | |
|---|---|---|---|
| Wildfire Safety Risk (without Risk Aversion) $M | $8,460.41 | $13,814.72 | $22,275.13 |
| Wildfire Total Risk (with Safety Risk Aversion) $M | $14,592.42 | $17,941.01 | $32,533.43 |

**Table 2 -** - *Identical to* **Table 1** *except applies SDG&E's risk scaling function and its equivalent fatality estimates only to the Safety attribute and not the financial or reliability attributes. Note that SDG&E's estimates of fatalities per structure is addressed in the consequence section. VSL of $16.2 M is used.*

p. 21:

*Table 2 demonstrates that while applying risk scaling to only the safety attribute still substantially increases the total risk estimate (from $25.1 B to $ 32.5 B), it is still a factor of 7 lower than if the risk-averse function were to be applied to all attributes ($210 B). MGRA does not recommend this approach, but it at the least adheres to the principal of mass-casualty aversion. SDG&E's application of a multiplier to its entire risk including financial and reliability risk lacks foundation and should not be used in any way by Energy Safety.*

### 4.2.3. Risk Scaling Discussion and Recommendations

Risk scaling is one of the weightiest matters that needs to be determined during the GRC cycle. As MGRA has noted, utilities have spent years improving, tuning and honing their risk models in order to improve their accuracy and precision. At the end of this process, to multiply this risk value by an arbitrary and large factor disregards the work put in by SDG&E employees, Commission staff, and intervenors over the last decade. MGRA has raised its concerns about risk scaling in the PG&E RAMP and GRC proceedings, in the WMP, in its informal comments to SPD, and in these comments on the RAMP.

The question before the Commission at this point is what to do with the information. SDG&E dismissed MGRA concerns about its scaling process in the course of the OEIS WMP process, and we should expect a similar response to these RAMP comments. Because RAMP is non-determinative, there will by default be no follow up in the course of this proceeding. SDG&E's obligations regarding how to process this input in its GRC are de minimis – it needs to only state it has addressed the issue, provide the justifications it used in its WMP responses and in its Reply, and continue. Concerns about SDG&E's methodology are now available to the record in its GRC.

SDG&E will have to make available non-scaled data and analysis as it goes into its GRC phase, so in the end the Commission will make the choice of which approach to accept. The question of whether risk-averse scaling is an appropriate projection of public sentiment is addressed in a review article cited by MGRA (Rheinberger and Treich, 2017), which concludes that "it depends" – different studies have come up with different results, but concludes that under many scenarios people do not adopt risk-averse attitudes. It will be the Commission's job to decide on behalf of "the public" whether a risk-averse attitude is appropriate for determining wildfire spending and priorities, and then whether SDG&E's risk attitude is correct. Despite SDG&E's incorrect claim that MGRA has a strong negative opinion of risk scaling per se (as opposed to SDG&E's implementation), even if it did that would be "an opinion", and not one that MGRA asserts should be the "public opinion". SDG&E, on the other hand, conflates "SDG&E risk attitude" with "societal risk attitude" and claims to be acting on the public's behalf, even though SDG&E has a perverse incentive to drive up calculated risk values and thereby spending.

SDG&E's justifications are weak and it is unlikely to prevail in convincing the Commission to adopt its risk scaling model if it goes forward with the arguments it has presented to date. In order to streamline the upcoming GRC, it would be good if some of these issues could be addressed prior to and in SDG&E's GRC filing. First, it would benefit SDG&E to prepare a version of its risk-averse scaling that applies only to the safety attribute, and not the financial or reliability attributes. MGRA presents a method for doing this and an example in the prior subsection. Literature search has not revealed any support for SDG&E's assertions that public risk attitude or attitude used in other industry sectors that applies to potential fatalities can be directly carried over to financial losses or reliability. MGRA re-iterated its request for external references regarding risk aversion for financial and reliability losses in a data request, and SDG&E failed to provide any, instead simply repeating the methodology it uses to obtain the result.[36] To be clear: the assertion that risk aversion should be applied to financial losses and reliability risks, and that the function used to describe aversion to safety risks should be the same as that for financial loss and reliability is entirely an SDG&E invention and has no support in academic literature or in industry best practices. Furthermore, it implies absurd results, such as extremely high imputed risk premiums. Second, the GRC process would benefit if the Commissioner or ALJ would issue a ruling in the current proceeding emphasizing what areas SDG&E should improve in its upcoming GRC filing, and this

[36] SDGE DRR MGRA-SDGE-003-3. Appendix B.

should include a requirement for cited sources for its use of risk scaling with financial and reliability attributes. A precedent was the April 22, 2025 Ruling in the PG&E RAMP proceeding laying out further requirements for PG&E's GRC filing.[37]

**Recommendations:**

- In addition to risk neutral scaling, if SDG&E wishes to pursue a risk-averse scaling it should present analysis in which risk aversion is applied only to the attribute(s) that are supported in the literature, in this case specifically safety risk.
- The ALJ should issue a ruling prior to the proceeding requiring SDG&E to provide additional information supporting its proposed risk scaling function:
    - References supporting the application of SDG&E's risk scaling function to the financial attribute.
    - References supporting the application of SDG&E's risk scaling function to the reliability attribute.

### 4.3. SDG&E Fails to Address Customer Reliability Classes

The Report states that: "*SDG&E uses a flat $3.67 per CMI to represent the electric reliability valuation for all customer classes, while actual values vary significantly by customer type ($188 for large C&I vs. $0.05 for residential). A single value overlooks important differences in how outages affect residential versus non-residential customers and does not account for higher-risk and lower-risk regions. This over-aggregation can increase residential reliability costs and distort CBR results*."[38] The Report recommends that "*SDG&E should calculate and use ICE Calculator granularity at the level of customer class (i.e., residential vs non-residential) separated by HFTD and non-HFTD regions. SDG&E should use the corresponding dollars per CMI values for each customer class and HFTD tier in the CBR calculation of mitigation projects to ensure consistent and representative valuation of electric reliability*."[39] It is important to note that SDG&E does not break commercial customers into "large C&I" versus small business.

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[37] A.24-05-008; ADMINISTRATIVE LAW JUDGE'S RULING TO PACIFIC GAS AND ELECTRIC COMPANY DIRECTING THE SERVICE OF ADDITIONAL INFORMATION AND OTHER REQUIREMENTS; April 22, 2025.
[38] SPD Report; p. 121.
[39] SPD Report; p. 146.

### 4.3.1. MGRA Analysis of Residential versus Commercial Costs and Mitigations

MGRA was able to obtain additional information from SDG&E that provides insight into residential versus commercial costs

MGRA in its Data Request 2 asked SDG&E to provide additional data about commercial and residential customers serviced by each of its circuit segments, along with its total projected annual outage for each circuit segment based upon backcasting.[40] MGRA's request stated *"b. For all circuit segments planned for undergrounding during this GRC period based on PSPS considerations – high wind speed, bundling, or economies of scale – provide the following data in an Excel spreadsheet:*

*a) Circuit segment*

*b) Proposed circuit miles of undergrounding to be performed*

*c) Maximum measured wind speed associated with the circuit used in the assessment*

*d) Number of commercial customers on the circuit segment*

*e) Number of residential customers on the circuit segment*

*f) Projected number of minutes of PSPS outage per year, based on historical backcasting and used in the calculation of "PSPS Risk" for that circuit segment.*"

Using the data SDG&E provided in response, it is possible to evaluate the efficacy of its wildfire mitigation program as a reliability program.

The data provided by SDG&E was used to calculate several additional pieces of information. For example, SDG&E was able to provide the number of commercial and residential customers per circuit segment. Because we know that 1) SDG&E uses $0.05 per CMI for residential customers and 2) The average used by SDG&E for all customers is $3.67 per CMI, it is possible to solve for SDG&E's effective rate for commercial customers, assuming that the $3.67 per CMI is accurate for the set of proposed undergrounding segments. Totals and averages listed below.

[40] Workpapers; MGRA-SDGE-002_Attach_Q3a_19501-jwm.xlsx

| | |
|---|---|
| Total Circuit Segments | 83 |
| Residential Customers | 12,074 |
| Commercial Customers | 2,127 |
| Total Customers | 14,201 |
| Total Ann Avg CMI | 3,245,093 |
| Total Ann Avg $CMI (3.67) | $11,090,491 |
| ICE 1.0 Residential CMI | $0.05 |
| Effective Commercial $CMI | $24.22 |
| Total Ann Avg $CMI (Adj) | $12,835,218 |
| Circuits with Gust > 55 mph | 26 |
| UG Cost/mile | $2,500,000 |
| UG Miles Proposed | 861 |
| UG Proposed Cost | $2,151,831,959 |
| Annualized Avg UG Cost | $39,124,217 |
| Average ROI of UG for CMI | 168 yrs |
| Number circuits ROI < 55 yrs | 5 |
| Annual Battery Costs | $33,344,000 |
| Circuits with Ann. Battery $ < CMI | 3 |
| Circuits with Ann. Battery $ < Ann SUG $ | 68 |

**Table 3 -** Summary of SDG&E circuit segments proposed for undergrounding, including number of residential and commercial customers, total annual CMI costs, circuit mileage and estimated undergrounding cost, average ROI time for undergrounding with respect to CMI. Additionally, an example battery replacement project with $20k residential and $200k commercial cost and 20 year battery life was compared against undergrounding and found to be less expensive for 68 of the 83 circuits examined.[41]

The MGRA analysis looked at the total number of residential and commercial customers and using an average CMI of $3.67 and a residential CMI of $0.05 was able to conclude that the effective commercial CMI is $24.22.

[41] Workpapers; MGRA-SDGE-002_Attach_Q3a_19501-jwm.xlsx.

The MGRA analysis includes an example battery-based alternative mitigation, similar to the PG&E program being proposed in its GRC.[42] In this theoretical example, a residential backup battery was estimated to cost $20k and a commercial backup $200k, and both to have a 20 year lifetime. PG&E justified its program not only from the standpoint of reliability for customers who have frequent PSPS but also because batteries can potentially be used as distributed energy storage. MGRA's analysis reaches the following conclusions:

- SDG&E should provide an effective commercial customer CMI if it continues to use ICE 1.0 in its GRC filing.
- Reducing Customer Minutes Interrupted using ICE 1.0 costs rarely provides a positive BCR based on reliability alone.
    - For undergrounding, only 5 circuits of the 83 proposed would have a favorable BCR, and this assumes that upstream undergrounding has already been performed.
    - For battery replacement, only 3 circuits would have a favorable BCR based on CMI improvements alone.
- Only 26 of the circuit segments proposed for undergrounding have wind gusts in excess of 55 mph.
- For 68 of the 83 circuits proposed for undergrounding, the average amortized annual cost for a battery backup system is less than the average amortized annual cost for undergrounding.

**Recommendations:**

- SDG&E should provide an effective commercial customer CMI if it continues to use ICE 1.0 in its GRC filing.
- SDG&E should prepare a backup battery alternative mitigation for comparison with undergrounding for circuit segments where PSPS is frequent and CMI is high. SDG&E should use appropriate market pricing for customer and commercial battery backup. This

[42] A.25-05-009; PG&E Testimony PG&E-4; p. 6-61; Customer Battery Infrastructure Program (Capital MWC 21).

should be used in conjunction with aggressive PSPS thresholds in the calculation of wildfire risk reduction.

## 5. REVIEW OF SDG&E 2025 RAMP

The following items were not analyzed in the SPD review but are relevant to the preparation of SDG&E and revenue request.

### 5.1. Improvements in the SDG&E Analysis

SDG&E made several significant improvements in its risk analysis that should be included and further developed in its GRC filing.

#### 5.1.1. Increase of wildfire simulation duration to 24 hours

SDG&E correctly notes that "*Relying on one worst-case instance of wildfire activity to define the existing wildfire risk could underestimate potential future threats. Therefore, a broader range of data must be incorporated, including predictive modeling and climate projections, to result in a comprehensive and resilient wildfire mitigation strategy*."[43] To account for this shortcoming, SDG&E increased duration of unsuppressed wildfire simulations using Technosylva's FireSight to 24 hours and verified that the results aligned with the Generalized Pareto Distribution model.[44] MGRA has supported increasing simulation times to 24 hours since the initial adoption of Technosylva wildfire simulations in order to better account for tail risk events.

#### 5.1.2. Probability of Failure Models

MGRA has from the beginning of its interventions at the CPUC called for utilities to adopt a science-based approach to determining wildfire risk. This is because for the most part catastrophic utility wildfires are initiated versus a "common-cause" failure mechanism:[45] High winds cause

[43] RAMP; SDG&E-Risk-4; p. 27.
[44] Id.
[45] Mitchell, J.W., 2013. Power line failures and catastrophic wildfires under extreme weather conditions. Engineering Failure Analysis, Special issue on ICEFA V- Part 1 35, 726–735. https://doi.org/10.1016/j.engfailanal.2013.07.006.

damage to utility equipment either directly or through causing vegetation or other objects to make contact with utility lines, this contact initiates an electrical arc, the arc ignites nearby vegetation causing a wildfire, and under fire weather conditions and high winds the wildfire grows rapidly to the point where fire services cannot contain it. This is not the sole mechanism causing utility wildfire – "fuel driven" wildfires can occur when humidity and vegetation moisture content are low, such as the Dixie and Butte fires – but wind-driven wildfires have caused the vast majority of fatalities, injuries, and property loss from utility-related wildfires.

While SDG&E provided background and technical detail on its WiNGS-Planning and WiNGS-Ops models in its 2026-2028 WMP and RAMP filing and workpapers, it was still not clear to what extent SDG&E's models incorporated the physical cause and effect relationships between the wind-related probability of failure. In its response to MGRA Data Request 2,[46] SDG&E provides a clear and detailed description of how its models work for conductor and vegetation risk drivers that shows that it incorporates a scientifically reasonable physical and statistical framework, consisting of the following elements:

- A Monte Carlo model that selects from historical weather conditions (or predicted weather conditions for operational models) that uses a probability of failure (PoF), Probability of Ignition (PoI), and 24 hour consequence modeling to determine risk.
- A Probability-of-Failure model based on a multivariate regression fit to historical data including hourly wind data. This provides a probability that a risk driver will occur given hourly weather inputs.
- A conditional Probability-of-Ignition model that assumes that a fault has occurred. It is based on a multivariate regression fit to historical data including hourly weather data.
- Consequence modeling based on 24 hour simulations of a wildfire ignition.

This approach differentiates SDG&E's model from the probability models used by PG&E and SCE, which rely on machine-learning. The weakness in those data-driven models is that they have no mechanism to incorporate hourly wind data and therefore underestimate the amplification

[46] See Appendix B.

effect of wind on utility wildfire risk. The SCE and PG&E models therefore fail to incorporate the following effects readily shown in the SDG&E models:

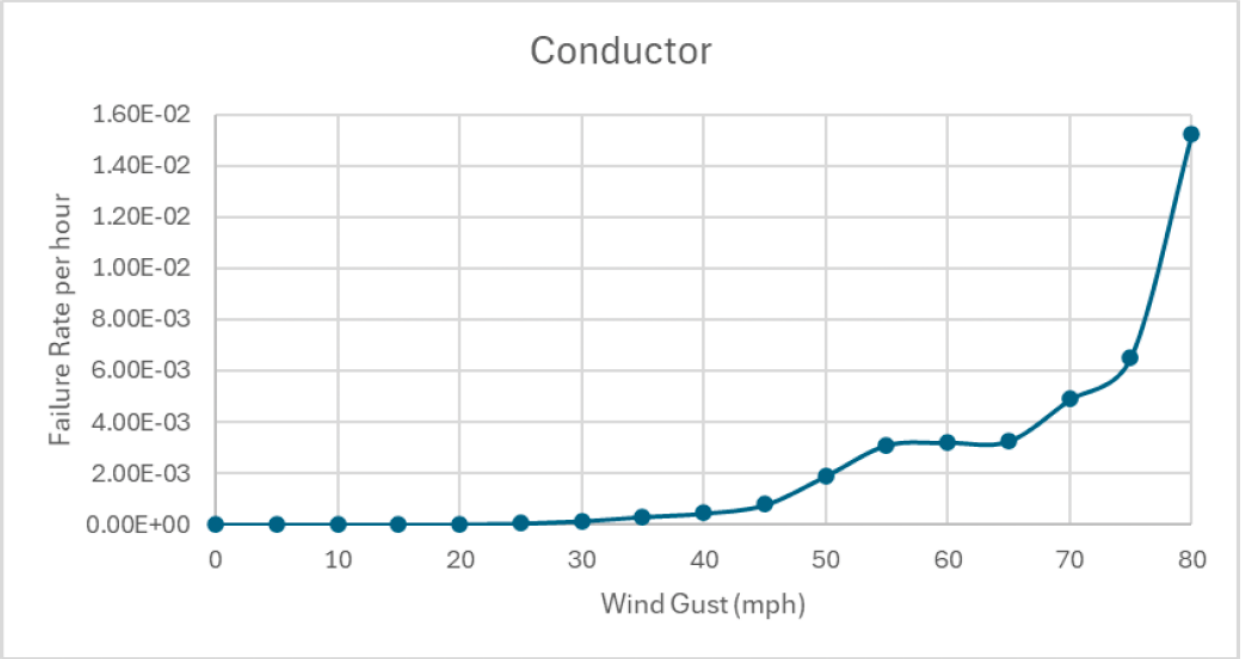
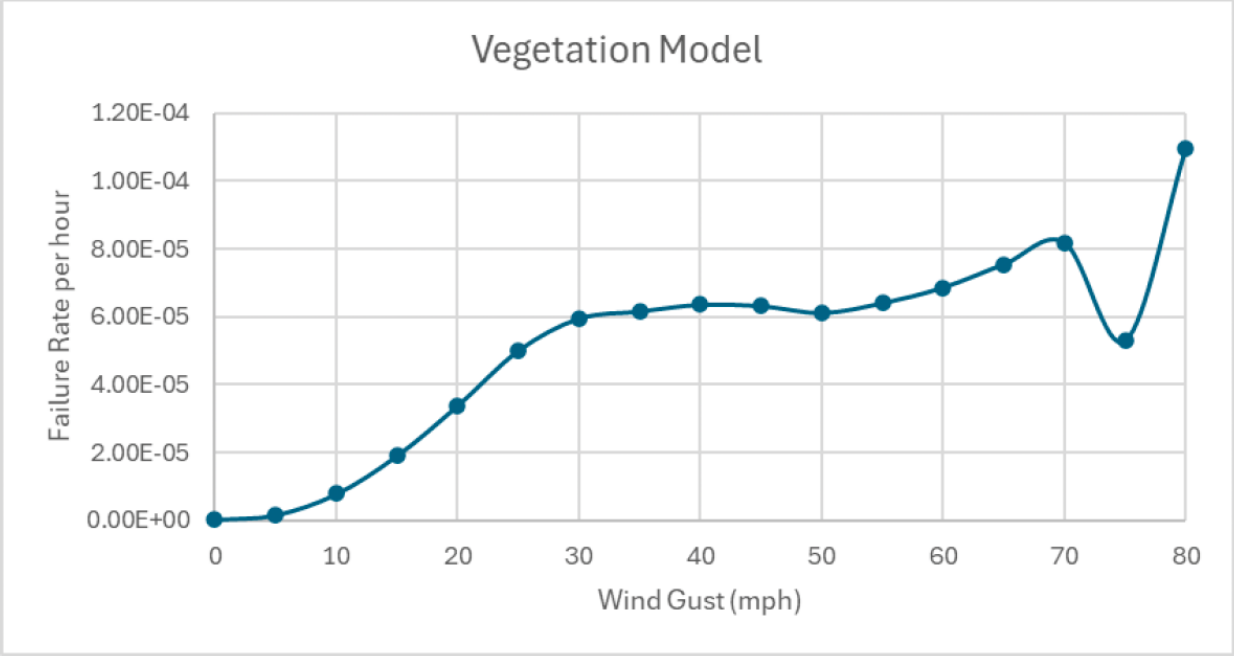



**Figure 3 -** SDG&E's Probability of Failure regression model fit for conductor failure driver, showing failure rate per hour versus wind gust speed.[47]




[47] SDG&E DR Response MGRA-2-2.a.

**Figure 4 -** SDG&E's Probability of Failure regression model fit for vegetation failure driver, showing failure rate per hour versus wind gust speed.[48]

These results are consistent with MGRA filings in previous proceedings and Mitchell 2013, which itself was based on SDG&E outage data. While SDG&E's analysis itself and the manner in which the fit was performed has not been validated, the steep dependency between outage rate on wind speed shows is similar to that also seen in SCE and PG&E outage data.

SDG&E additionally provides the relationship between conditional ignition probability (assuming a fault) and wind speed:

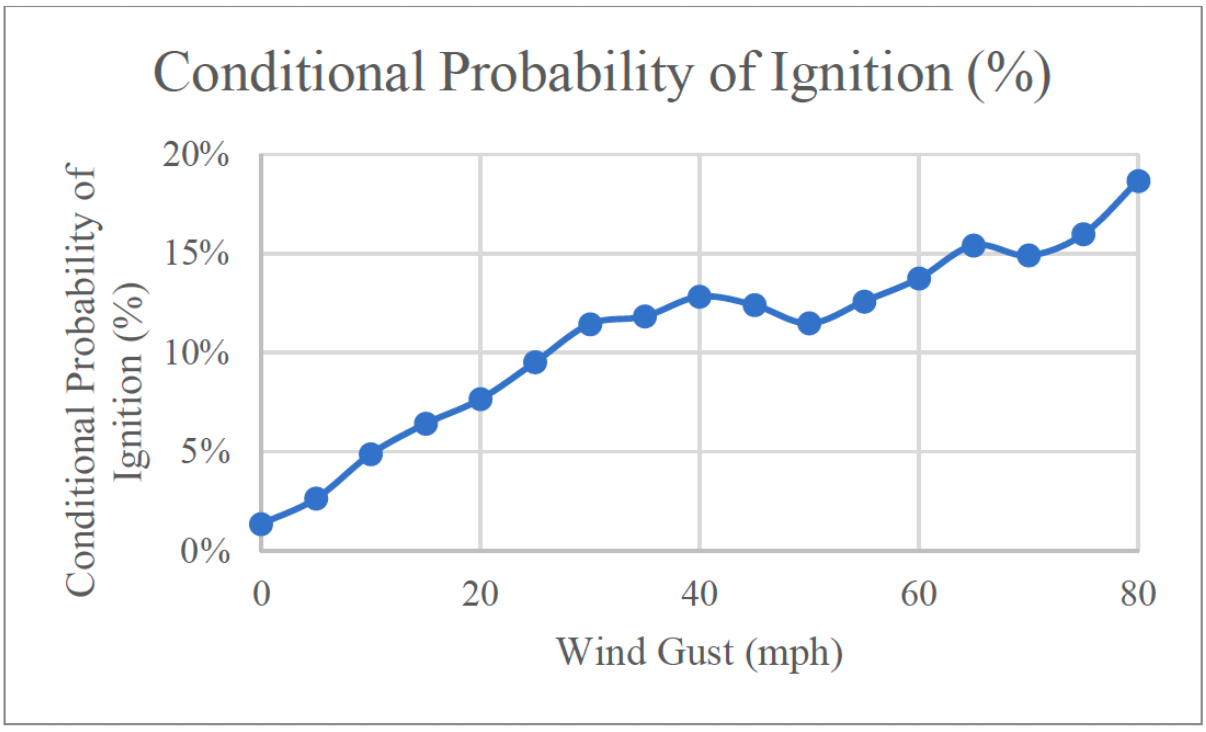



**Figure 5 -** SDG&E's conditional probability of ignition, i.e. under the assumption that an outage occurs, as a function of wind gust speed.

This dependency demonstrates another multiplicative effect increasing the likelihood of a catastrophic wildfire. The combined effects of increase of outage probability with wind speed, the increase of ignition probability with wind speed, and the increase of wildfire spread rate with wind speed explain why the vast majority of life and structure loss from utility-related wildfires occur during wind-driven events.

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[48] Id.

While SDG&E's approach is encouraging, it needs to be noted that SDG&E's PoF models are only used for conductor failure and vegetation drivers. SDG&E creates another class of drivers "Other Equipment & Foreign Object PoF" which it describes as "*a deterministic model that is used to account for the number of historical outages that do not show a correlation with wind gust conditions or exhibit significant seasonality. This model captures outages resulting from equipment failures that are not related to wind events, such as fuse damages, recloser malfunctions, and transformer issues. It also accounts for outages caused by external forces, including animal interference, balloons, and contact by employees or members of the public. The model also includes random outages due to vandalism, theft, and other unforeseen incidents*."[49]

SDG&E's DR Response also includes a graph showing that indeed this driver category, does not show a positive wind dependency.

The "Other Equipment & Foreign Object" category appears to at the same time to be overbroad and not to mention other known wind-related effects, such as damage noted in post-PSPS patrols. These other wind-related damage effects include:

- Damage to utility poles
- Cross arm damage
- Damage to insulators
- Contact between communications equipment and utility equipment

These potential drivers are covered, partially, by SDG&E's "Pole/Span Conditional Probability of Ignition" adjustment, but this does not account for the wind sensitivity of the initial damage event.

Evidence that SDG&E's risk model, while good in principle, appears to lack skill in predicting wind damage events that occur during PSPS, particularly to cross arms. This is discussed in more detail in Section 5.2.2.

[49] SDG&E-Risk-4; p. 24; Table 4.

**Recommendation:**

- The WiNGS-Planning risk model used in SDG&E's GRC filing should continue to use the PoF and PoI models described in SDGE's data request responses for vegetation and conductor failure drivers, along with any quantitative improvements in modeling data and methods.
- SDG&E should develop another PoF model that is applicable to wind-related damage from causes other than conductor failure and vegetation contact, including pole damage, cross arm damage, damage to insulators, and contact with non-utility equipment such as communications equipment.

#### 5.1.2.1. Further clarification of SDG&E's vegetation risk model is needed

In the details that SDG&E provided regarding its vegetation risk model in its DR responses to MGRA, it gave a wind-dependent outage rate for different tree species, shown below:

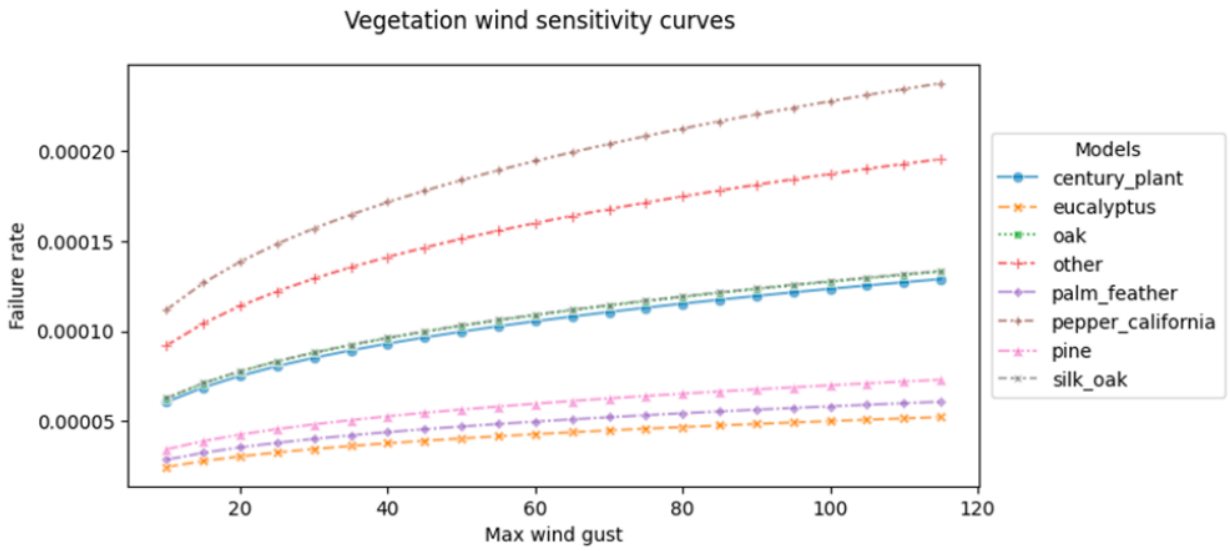


**Figure 6 -** SDG&E vegetation wind sensitivity curves based on a log-log regression model and showing an estimated failure rate per mile per year.[50]

Its DR response state that: "*SDG&E's current vegetation risk model estimates a failure rate per mile per year, which serves as the basis for quantifying vegetation-related risk across the system. Importantly, the model incorporates span-level vegetation characteristics by controlling for*

[50] DRR MGRA-SDGE-003-1. Appendix B.

*both the number and type of trees associated with each span. This allows the model to account for variations in vegetation density and species-specific risk factors, improving the accuracy of failure rate predictions and supporting more targeted vegetation management strategies*."

However, the results of SDG&E's analysis are surprising based upon previous data SDG&E submitted to and analyzed by MGRA. According to the graph shown above, it would be expected that eucalyptus, palm and pine have the lowest failure rates whereas this was exactly the opposite in data analyzed by MGRA in the course of the 2020 WMPs,[51] shown in the table below:

| Species | Average Inventory | Average Outages per year | Total Outages | % of total outages | Outages per 1000 trees per year |
|---|---|---|---|---|---|
| Eucalyptus | 48116 | 25.50 | 459 | 41.90% | 0.53 |
| Palm | 11223 | 12.50 | 225 | 20.50% | 1.11 |
| Pine | 11509 | 8.11 | 146 | 13.30% | 0.70 |
| Oak | 19510 | 3.72 | 67 | 6.10% | 0.19 |
| Sycamore | 3118 | 1.11 | 20 | 1.80% | 0.36 |
| Pepper (California) | 8462 | 0.94 | 17 | 1.60% | 0.11 |
| Cottonwood | 1931 | 0.72 | 13 | 1.20% | 0.37 |
| Avocado | 11838 | 0.72 | 13 | 1.20% | 0.06 |
| Cypress | 473 | 0.67 | 12 | 1.10% | 1.42 |
| Ash | 4706 | 0.61 | 11 | 1.00% | 0.13 |
| Century Plant | 401 | 0.50 | 9 | 0.80% | 1.25 |
| Ficus | 1587 | 0.50 | 9 | 0.80% | 0.32 |
| Willow | 9099 | 0.50 | 9 | 0.80% | 0.05 |
| Silk Oak | 1578 | 0.44 | 8 | 0.70% | 0.28 |
| Tamarisk/Salt Cedar | 1310 | 0.39 | 7 | 0.60% | 0.30 |

**Table 4 -** MGRA analysis of SDG&E data on faults per tree type per year, done as part of its 2020 WMP analysis.

Furthermore, eucalyptus and palm trees are known problems for utility equipment, so it is extremely odd that SDG&E's analysis appears to rank them at low risk. Possible explanations might be an error in the legend of the figure supplied by SDG&E, or potentially that SDG&E is looking at existing risk after years of vegetation mitigation and has removed potential threats from eucalyptus and palm. In any case, while SDG&E's attempt to quantify wind dependencies is a positive step its results need to be further clarified before it should be used in the GRC or suggested as a general best practice. Hopefully an explanation can be provided in SDG&E's Reply.

[51] CPUC Wildfire Safety Division; MUSSEY GRADE ROAD ALLIANCE COMMENTS ON 2020 WILDFIRE MITIGATION PLAN Q3 QUARTERLY REPORT OF SDG&E, PG&E, AND SCE; September 30, 2020; p. 5.

**Recommendation:**

- SDG&E needs to further clarify why tree varieties such as eucalyptus and palm show as having low fault rates.

#### 5.1.3. SDG&E Mitigation Analysis Excel Workbooks

SDG&E states that its "*Excel workbooks are designed to be user-friendly, allowing users to easily evaluate any feeder segment within the service territory*."[52] A "live" workbook with functioning formulae meets this criterion and greatly increases the transparency of SDG&E's wildfire risk analysis and greatly reduces the need for parties to request bespoke analyses from the utility, resulting in a reduction in time and effort (and thereby ratepayer money) required.

SDG&E's model should be considered a best practice and development of similar user configurable spreadsheets should be encouraged for other utility RAMP and GRC proceedings.

### 5.2. Issues with SDG&E Risk Estimations

#### 5.2.1. Removal of wildfire smoke risk estimation

One area that MGRA analyzed in detail in past SDG&E RAMP, GRC and WMP filings was the inclusion of a wildfire smoke risk estimate.[53] While MGRA maintained (and still maintains) that SDG&E's previous estimates of wildfire smoke risk contain technical errors, the general principle of applying a correction to risk estimates to account for safety and health effects of wildfire smoke is sound. This issue has been discussed in other proceedings, in the WMPs, and in the OEIS Risk Modelling Working Group. At this point, no clear valid methodology exists for doing an accurate estimate of wildfire smoke harm due to its complexity. SDG&E correctly states that "*The complexity arises from several factors, including but not limited to the variability in wildfire behavior, identifying and quantifying the type of material burned, the duration of the fire,*

[52] DRR MGRA-SDGE-002-4.
[53] A.21-05-011-14; MUSSEY GRADE ROAD ALLIANCE INFORMAL COMMENTS TO THE SAFETY POLICY DIVISION REGARDING SAN DIEGO GAS AND ELECTRIC COMPANY'S RAMP FILING; October 22, 2021; pp. 5-17.

*the diverse locations and existing characteristics of the customers impacted, and the difficulty in predicting long-term environmental impacts*."[54] However, when SDG&E states that "*While the removal of the Acres Burned sub-attribute may lead to an underestimation of wildfire risk in SDG&E's service territory, this change is intended to streamline the wildfire risk quantification process and improve the accuracy of SDG&E's assessments to provide a more transparent wildfire risk evaluation*," this is not completely correct. Based on current research on wildfire smoke health effects, the impact of wildfire smoke is expected to be significant, and based on previous MGRA analysis likely to be comparable to or even larger than direct wildfire safety risk. Therefore, removing wildfire smoke risk doesn't make SDG&E's estimate more *accurate*, rather it makes it more *precise.* An estimate that includes a highly uncertain wildfire smoke risk estimate may be "wrong", but it is "less wrong" than an estimate that ignores a major health and safety effect entirely.

**Recommendation:**

- SDG&E should restore a wildfire smoke risk estimation to its wildfire risk analytical framework.

### 5.2.2. SDG&E PSPS damage reports suggest low predictive skill of risk model for infrastructure damage

SDG&E does not use a probability of failure model for infrastructure damage such as pole and cross arm failure. As described in SDG&E's WMP filings and MGRA's comments, SDG&E does apply a multiplier to ignition rates to account for wind. SDG&E elaborates in its response to data request MGRA-2026-8-03-Q2: "*To distinguish and quantify the wildfire risk for a given risk driver that occurred at locations prone to wildfire conditions, the 99th percentile wind gust for a given location is compared to the 25th, 50th, 75th of the overall 99th percentile wind guests for all HFTD locations. The weight (WRwind) of the wind component for a risk event is calculated using $2^0$, $2^1$, $2^2$, and $2^3$, respectively."*[55]

As noted in the MGRA WMP comments, SDG&E's methodology is ad hoc, and in light of their RAMP data request responses it can be assumed that this correction is intended to model

[54] RAMP; SDG&E-Risk-4; p. 9.
[55] MGRA WMP Comments; p. 24.

probability of ignition given a fault, not a probability of failure that provides a further amplification factor. In any case, while there should be no objection in principle to applying such a correction for which SDG&E has provided technical support (Figure 5), it is not adequate. And in fact analysis of SDG&E PSPS damage reports provides strong circumstantial evidence that current SDG&E infrastructure is sensitive to wind damage.

MGRA WMP review extensively analyzed SDG&E's PSPS damage reports, specifically the December 2024 wind event.[56] Results are quoted below:

*As in the MGRA PG&E WMP Comments, MGRA analyzed weather station data in the vicinity of the reported damage point (for SDG&E within 3 miles), and calculated peak wind gust recorded by any station in the 72 hours prior to the reported damage time. MGRA's analysis also incorporates cause data from SDG&E's PSPS report.*[57]

*The results from the MGRA analysis are shown below. Damage/risk events are color coded by SDG&E's rated risk tier for the circuit on which the damage occurred (Top 5%, Top 5-10%, Top 10-15%, and Bottom 80%).*[58] *The numeric values show the maximum wind speed measured by any weather station within 5 miles of the damage within 72 hours of the damage report*.[59]

[56] MGRA WMP Comments; pp. 42-47.
[57] R.18-12-005; SAN DIEGO GAS & ELECTRIC COMPANY (U 902-E) PUBLIC SAFETY POWER SHUTOFF POST-EVENT GROUP REPORT FOR DECEMBER 09 – DECEMBER 11, 2024; January 10, 2025. (SDG&E Dec 2024 PSPS Report)
[58] Obtained in SDG&E DRR MGRA-2026-8-04-19.
[59] See supplemental file SDGE_2024_PSPS_Damage_3mi.xlsx, Tab SDGE24WIND. Wind analysis was performed using the M-bar Technologies and Consulting, LLC wind analysis suite.

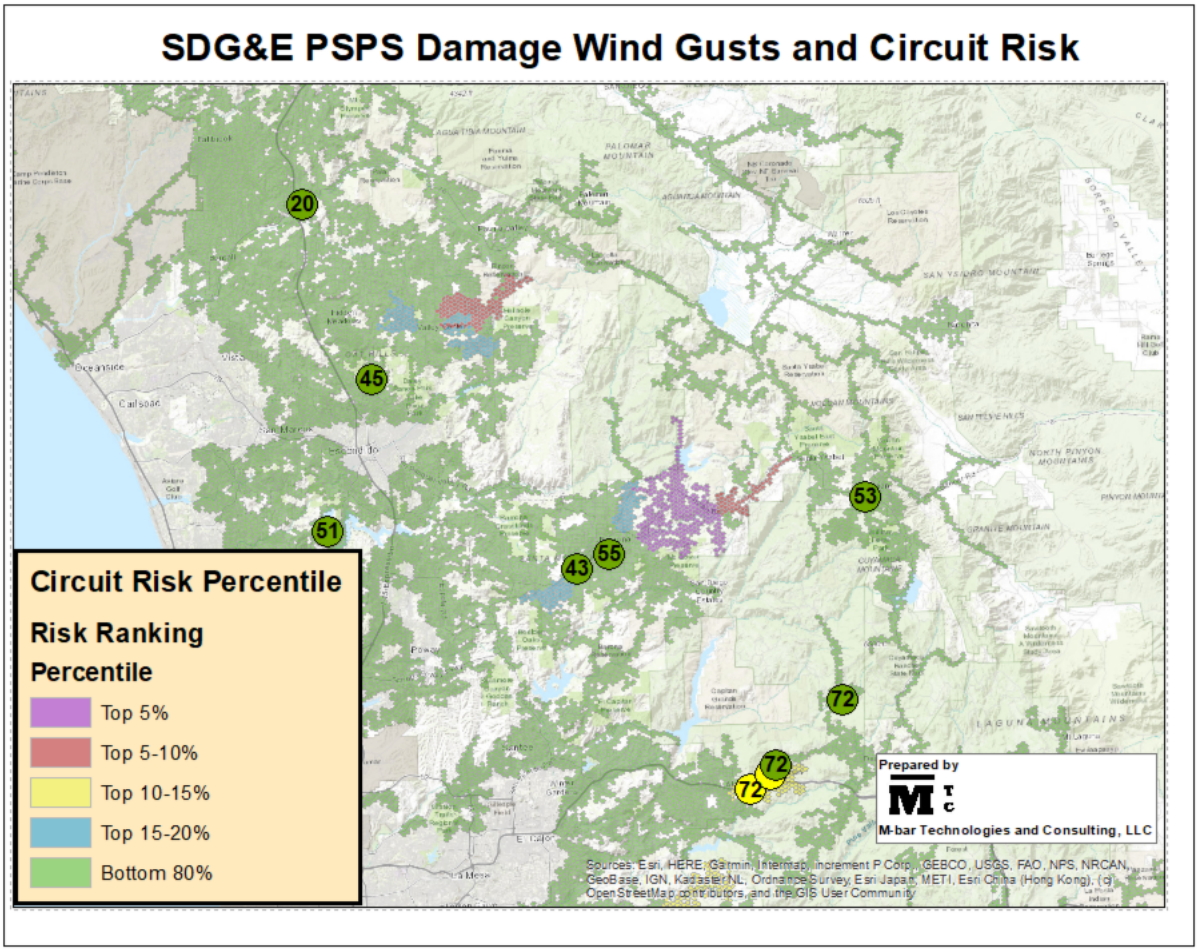


**Figure 7 -** SDG&E damage events identified in post-PSPS inspections. SDG&E's circuit risk tier is identified by color coding. The numeric values are the maximum wind gust speed in mph recorded by ground weather stations within three miles of the event in the 72 hour period prior to the damage report.

*One issue of concern is that of the ten PSPS damage events, only two were on circuits that SDG&E ranks in the top 20% risk tier, and none of them occurred on circuits within the top 10% risk tier. This is in stark contrast with PG&E, for which the majority of PSPS damage events occurred on the 5% highest risk circuits and all but one occurred on circuits in the top 10% risk tier.*[60] *Also noteworthy is that areas with nearby wind gust speeds of 72 mph still ranked in the lowest 80%. Looking at areas where SDG&E calculates its highest risk tiers, these are highly concentrated and mostly to the northeast of population centers Valley Center (NW) and Ramona (central). This supports the suspicion that SDG&E is not properly incorporating ignition risk from wind drivers into its risk analysis,*[61] *and therefore concentrating on consequence. This suspicion*

[60] MGRA PG&E WMP Comments; p. 53; Figure 11.
[61] Section **Error! Reference source not found.**.

*finds additional evidence if one examines the cause of the damage, provided in SDG&E's PSPS report along with photographs of the damage. This is summarized below:*

| Pole ID | Cause | Max 3 mi Gust (mph) |
|---|---|---|
| P710840 | Object - Telco | 44.9 |
| P376436 | Cross arm | 72.0 |
| P213996 | Transformer - Leak | 19.6 |
| P119515 | Cross arm | 50.9 |
| P419391 | Vegetation - Blow-in | 43.2 |
| P516439 | Cross arm | 54.7 |
| P78896 | Guy | 72.3 |
| P78880 | Cross arm | 72.3 |
| P166012 | Cross arm | 53.5 |
| P179023 | Cross arm | 72.3 |

**Table 5 -** SDG&E December 2024 PSPS risk events, along with causes listed in SDG&E's Dec 2024 PSPS Report and wind gusts calculated using M-bar Technologies and Consulting, LLC analysis available in Github. Wind gusts are the maximum measured at any weather station reported by Synoptic in the 72 hours before the damage event was attributed by SDG&E and within 3 miles of the reported damage event. Complete results can be found in Workpaper "SDGE_PspsEventDamagePoint_2024_3mi".xlsx, tab SDGE24WIND.

*The fact that most of the reported risk events were due to physical infrastructure damage, particularly to cross arms, is an indication that SDG&E's infrastructure is not able to tolerate the wind gusts typical of its service area. Three of these cross arm failures occurred when no weather station within 3 miles recorded gusts greater than 56 mph prior to the discovery of the damage, which SDG&E claims is its understanding of the GO 95 requirement. These are not new poles, as shown in the photo below*:

**Figure 23 - Item #6 P516439 Damaged Crossarm**

**Figure 8 -** Photo of damaged cross arm P516439 provided by SDG&E in their report on the December 9-11, 2024 PSPS event. The maximum recorded wind gust within 3 miles of this pole in the 72 hours prior to SDG&E's attribution of the damage time was 54.7 mph.

*It is not known whether any of these specific damage events would have led to arcing had the line been energized. However, the risk is significant enough that in retrospect de-energization was appropriate for this weather event. However, the fact that some of this damage was occurring at modest wind speeds regularly encountered in the SDG&E service area is a problem. SDG&E's preferred solution to the issue is undergrounding, but this is expensive and slow to deploy. Additionally, the circuits showing this damage are not rated as high priority by SDG&E. Covered conductor, on the other hand, while not mitigating all cross arm breakage risk, would entail replacement with hardened cross arms and poles and would be much less susceptible to the type of damage seen during the December 9-11$^{th}$ weather event. It would enable SDG&E to raise its shutoff threshold, which substantially reduces the frequency, extent, and duration of PSPS events.*

**Recommendation:**

- SDG&E should develop another PoF model that is applicable to wind-related damage from causes other than conductor failure and vegetation contact, including pole damage, cross arm damage, damage to insulators, and contact with non-utility equipment such as communications equipment.

### 5.2.3. SDG&E's estimate of covered conductor effectiveness is too low

MGRA has long urged that field data be used when calculating covered conductor wildfire risk reduction efficiencies, and has argued that SDG&E's historical estimates have been too low. In its WMP and RAMP filings, SDG&E's estimates of covered conductor effectiveness have dropped still further, meriting concern from Energy Safety and contributing to its decision to reject SDG&E's WMP filing and require further explanation. While SPD did not specifically mention this problem in its Report this unexplained reduction in covered conductor efficiency is troubling because choice of mitigation is strongly dependent on wildfire reduction effectiveness. MGRA analyzed this question in significant detail in its evaluation of SDG&E's WMP R1 resubmission[62] and presents this analysis verbatim below:

*MGRA's Comments maintained that SDG&E's estimate of covered conductor effectiveness in reducing wildfire risk is seriously low, at only 58%.*[63] *Energy Safety's Rejection notes this anomaly, stating that "SDG&E used an effectiveness for reducing overall risk of 58% for combined covered conductor, which includes additional equipment replacements and installations, compared to 99% for strategic undergrounding. Previously, SDG&E estimated covered conductor alone to have an effectiveness of 64.5%, which did not include the benefits of additional mitigations. Additionally, when considering benefits from early fault detection (EFD), falling conductor protection (FCP), and PSPS, SDG&E estimated a 97.78% reduction in risk. SDG&E did not provide justification as to why it decreased its effectiveness estimates for covered conductor despite including additional mitigations. SDG&E also stated that it calculates the effectiveness for*

[62] MGRA SDG&E WMP R1 Comments; pp. 16-20.
[63] MGRA WMP Comments; pp. 51-57. Note that the MGRA estimate for SCE risk reduction was not based on final SCE data. SCE was not able to reproduce data provided in previous years, and its recent data indicates a lower effectiveness than stated in the MGRA SDG&E comments. Depending on assumptions the effectiveness derived from SCE data is now 74-81%. SCE's stated efficiency is 72%.

*combined covered conductor based on the baseline condition of the asset, but did not use the same methodology for undergrounding*."[64]

*SDG&E provides a transparent explanation of its current methodology in Section 6.1.3.1.5, which explains how it comes to a lower value. To summarize:*

- *SDG&E uses calculated risk rather than ignition frequency to estimate risk reduction.*
- *Risk incorporates consequence, increasing the contribution of ignition drivers likely to occur in high-consequence areas compared to lower-consequence areas.*
- *SDG&E uses what it calls "evidence of heat" events in addition to CPUC Reportable Ignitions*
- *"Evidence of heat" events statistically have drivers with a lower covered conductor mitigation efficiency than CPUC reportable events.*

*SDG&E estimates a CC mitigation effectiveness for CPUC Reportable events of 61.7% (which MGRA maintains is still too low), which when combined with ESD and FCP they estimate at 70.1%.[65] These drop to 50.5% and 61.3% respectively when "evidence of heat" is used.*

#### *5.2.3.1. "Evidence of Heat" as a Risk Proxy*

*SDG&E increases the number of statistical events from 122 (Reportable ignitions, 2019-2024) to 902 (Reportable ignitions + evidence of heat, 2019-2024) , a factor of 7 increase. This can be valuable to the extent that the risk drivers leading to evidence of heat are representative of those that lead to large and catastrophic wildfires. However, the very fact that using this data results in a very significant change in covered conductor estimated ignition reduction implies that there are differences in the distribution of reportable ignitions and evidence of heat events. We can determine the cause of these differences by comparing SDG&E Tables 6-10 and 6-11.*

[64] Energy Safety Rejection; pp. 4-5.
[65] SDG&E WMP R1; Table 6-12; p. 122.

| Overhead Distribution Ignition-Related Drivers | 2024/2025 Subject Matter Expert Ignition-Related Reduction (%) | Total Number of CPUC Reportable Ignitions and Evidence of Heat Events [2019 - 2024] | Fraction CPUC+EoH | Unmitigated Fraction CPUC+EoH | Risk Driver Contribution CPUC + EoH | Total Number of CPUC Reportable Ignitions [2019 - 2024] | Fraction CPUC | Unmitigated Fraction CPUC | Risk Driver Contribution CPUC + EoH |
|---|---|---|---|---|---|---|---|---|---|
| Animal Contact | 90% | 20 | 2.2% | 0.2% | 0.4% | 19 | 15.6% | 1.6% | 4.0% |
| Balloon Contact | 90% | 27 | 3.0% | 0.3% | 0.6% | 9 | 7.4% | 0.7% | 1.9% |
| Vehicle Contact | 80% | 20 | 2.2% | 0.4% | 0.9% | 10 | 8.2% | 1.6% | 4.2% |
| Vegetation Contact | 90% | 72 | 8.0% | 0.8% | 1.6% | 11 | 9.0% | 0.9% | 2.3% |
| Other Contact* | 50% | 47 | 5.2% | 2.6% | 5.3% | 4 | 3.3% | 1.6% | 4.2% |
| Conductor | 90% | 123 | 13.6% | 1.4% | 2.8% | 10 | 8.2% | 0.8% | 2.1% |
| Equipment – Non-Conductor** | 39% | 412 | 45.7% | 27.9% | 56.2% | 49 | 40.2% | 24.5% | 63.3% |
| Other All*** | 10% | 151 | 16.7% | 15.1% | 30.4% | 9 | 7.4% | 6.6% | 17.2% |
| Undetermined**** | 70% | 10 | 1.1% | 0.3% | 0.7% | 1 | 0.8% | 0.2% | 0.6% |
| Overhead to Underground Connection | 75% | 20 | 2.2% | 0.6% | 1.1% | 0 | 0.0% | 0.0% | 0.0% |
| **Total** | **n/a** | **902** | | **49.5%** | 100.0% | **122** | | **38.7%** | 100.0% |

**Table 6 -** OH distribution ignition related drivers and subject matter expert estimates for Combined Covered Conductor ignition reduction efficiency, obtained from SDG&E's tables 6-10 and 6-11. Four columns (3-6,7-10) show total events reported, fraction of events represented by that driver, and the unmitigated fraction for that driver. Columns 3-6 show SDG&E's total including "evidence of heat" events while columns 7-10 show CPUC reportable ignitions only. Green highlighting indicates drivers for which that driver makes up a significatly larger fraction of reportable ignitions than evidence of heat events, and red highlighting shows the opposite.[66]

Table 6 *shows that there are distinct differences between the drivers that cause "evidence of heat" events and those causing ignitions submitted to the CPUC. In particular the "evidence of heat" events are more likely to be assigned to the "Other" or "Other Contact" categories. This is important because these two categories have very low SME estimates for CCC ignition reduction efficiency. As a result, while SDG&E estimates that 38.7% of reportable ignitions are unmitigated, this number rises to 49.5% if "evidence of heat" events are used.*

*Does "evidence of heat" represent a good risk proxy? About this SDG&E says that:*

"*SDG&E considers this approach to be more statistically robust and reflective of real-world conditions. Including all available ignition-related data, regardless of reporting thresholds enhances confidence in mitigation effectiveness estimates and ensures that decisions on long-term wildfire mitigation strategies are grounded in a thorough, data-driven evaluation of asset performance and ignition behavior under field conditions*."

[66] Workbook SDG&E_2026-2028_Base-WMP_SDGE Tables_R1-jwm.xlsx; Tab SDGE Table-6-10-11.

*If these are "real world conditions", then "evidence of heat" must demonstrate potential for ignitions, and it would be expected that the distribution of risk drivers would be similar for both distributions. However,* Table 6 *shows that they most definitely are not from the same distribution. Testing similarity with a chi squared distribution shows a probability of less than.$10^{-14}$ that these two samples arise from the same statistical distribution.*[67]

*Energy Safety's goal is to reduce or eliminate the risk of utility-related catastrophic wildfire, not utility related heat release. Including the sample including "evidence of heat" leads to estimates of wildfire risk that do not correspond to actual ignition data. This is not a "data-driven" approach, but simply incorrect. The art of data analysis, whether it is done using calculational approaches or machine learning, is to reduce data into the form of information. Adding more data to a sample only helps if it is statistically similar to the original sample. Otherwise it simply hides the signal being studied. The "evidence of heat" data increases the statistical sample but decreases its quality by including ignition drivers that have not been shown to be and are not expected to be causative of catastrophic wildfire ignition.*

**Recommendation:**

- SDG&E should continue to use reported ignition data rather than evidence-of-heat data, since the former correlates more readily with the likelihood of catastrophic wildfire. If SDG&E prepares analyses based on evidence-of-heat events, it should prepare parallel analyses using reported events only.

#### *5.2.3.2. Calculation of FCP efficacy is not correct*

*SDG&E calculates the combined effectiveness of covered conductor, falling conductor protection (FCP) and Early Fault Detection (ESD) as follows:*

*Combined Effectiveness = 1 − [(1 − CC Efficacy) × (1 − FCP Efficacy) × (1 − EFD Efficacy)*[68]

[67] See WMP Workpapers, python file Chi2-Table-6-10-11.py.
[68] SDGE WMP R1; p. 121.

*This relationship is only true if the efficacies are uncorrelated. However, the greatest vulnerability of covered conductor mitigated circuits is tree fall-in. This vulnerability is largely mitigated by FCP. FCP on its own has a very modest risk reduction efficacy, since most ignition risk drivers have nothing to do with falling conductors. However, SDG&E has estimated that the efficacy of FCP is high for falling conductors and breaks in conductors. This calculation needs to be performed on a driver-by-driver basis with an independent FCP efficacy calculated for each driver.*

**Recommendation:**

- SDG&E should re-calculate its combined effectiveness based on FCP effectiveness for each individual risk driver rather than an average.

#### 5.2.3.3. FCP effectiveness is higher for wind-related drivers

In SDG&E's response to MGRA DR 1-6, SDG&E provided its estimated FCP wildfire risk reduction efficiency for Falling Conductor Protection. MGRA further analyzed SDG&E's result with the goal of understanding the effectiveness of FCP for wind related drivers, which have been responsible for the vast majority of life and property losses from utility-related fires.[69]

In SDG&E's response, for each driver the effectiveness of FCP was estimated by subject matter experts (SMEs) for the 2024/2025 period. The number of risk events between 2019 and 2024 for each driver was then used to estimate the number of risk events reduced. SDG&E additionally notes that: "*The 2019-2024 period was characterized by an active PSPS regime that was used infrequently. In a regime where PSPS was not used, wind sensitive events would have increased and thereby the effectiveness of FCP*."[70]

The MGRA analysis further identifies drivers that are associated with (though not always caused by) high wind events and tallying these driver events and reduced events separately. The results are shown in the table below:

[69] See RAMP Workpapers, MGRA-SDGE-001_Attach_Q1-6_19428-FCP-jwm.xlsx
[70] Id.

| Drivers | SME Reduction FCP (%) | Risk Events | Risk Events Reduced | Wind Driver | Wind Driver Events | Wind Events Reduced |
|---|---|---|---|---|---|---|
| Animal contact | 0% | 293 | 0 | 0 | 0 | 0 |
| Balloon contact | 0% | 70 | 0 | 0 | 0 | 0 |
| Vegetation contact | 5% | 67 | 3.35 | 1 | 67 | 3.35 |
| Vehicle contact | 5% | 256 | 12.8 | 0 | 0 | 0 |
| Crossarm damage or failure | 10% | 89 | 8.9 | 1 | 89 | 8.9 |
| Conductor damage or failure | 90% | 131 | 117.9 | 1 | 131 | 117.9 |
| Insulator and bushing damage or failure | 0% | 20 | 0 | 1 | 20 | 0 |
| Other - contact | 0% | 68 | 0 | 1 | 68 | 0 |
| Other - equipment failure | 10% | 7 | 0.7 | 1 | 7 | 0.7 |
| Capacitor bank damage or failure | 0% | 6 | 0 | 0 | 0 | 0 |
| Fuse damage or failure | 0% | 74 | 0 | 0 | 0 | 0 |
| Lightning arrester damage or failure | 0% | 51 | 0 | 0 | 0 | 0 |
| Switch damage or failure | 0% | 6 | 0 | 0 | 0 | 0 |
| Pole damage or failure | 5% | 161 | 8.05 | 1 | 161 | 8.05 |
| Voltage regulator damage or failure | 0% | 5 | 0 | 0 | 0 | 0 |
| Recloser damage or failure | 75% | 6 | 4.5 | 0 | 0 | 0 |
| Anchor/guy damage or failure | 0% | 4 | 0 | 1 | 4 | 0 |
| Sectionalizer damage or failure | 0% | 0 | 0 | 0 | 0 | 0 |
| Connection device damage or failure | 20% | 133 | 26.6 | 0 | 0 | 0 |
| Transformer damage or failure | 0% | 103 | 0 | 0 | 0 | 0 |
| Wire-to-wire contact | 0% | 16 | 0 | 1 | 16 | 0 |
| Contamination | 0% | 3 | 0 | 0 | 0 | 0 |
| 3rd Party Contact | 0% | 29 | 0 | 0 | 0 | 0 |
| Vandalism/Theft | 0% | 14 | 0 | 0 | 0 | 0 |
| Other - All | 0% | 24 | 0 | 0 | 0 | 0 |
| Unknown | 0% | 663 | 0 | 0 | 0 | 0 |
| Lightning | 0% | 136 | 0 | 0 | 0 | 0 |

| | | | | | |
|---|---|---|---|---|---|
| | | | | | |
| **Totals** | 2435 | 182.8 | | 563 | 138.9 |
| **Effectiveness** | | 7.5% | | | 24.7% |

**Table 7 -** Efficiency of SDG&E FCP system in reducing wildfire risk drivers as per 2024-5 SME estimates and using 2019-2024 data. "Wind" columns were added by MGRA to identify drivers most likely to create a risk event during high winds.

As should be clear from the SDG&E/MGRA analysis, if wind-related drivers are examined alone, the efficiency of FCP in wildfire mitigation is 25%, nearly 3 times higher than for all risk events. FCP is literally a mitigation of "last resort" – it only activates if a failure has already occurred. As to why SDG&E's analysis should consider high wind events – except for the Butte and Dixie fires, all other California wildfires causing catastrophic life and property originated from wind-related drivers.

**Recommendation:**

- In its GRC, SDG&E should endeavor to incorporate proper causal chain in its WiNGS models so that greater FCP efficacy is shown to be in place during high wind events. Results should be included in their BCR calculations.

### 5.3. Higher Cover Covered Conductor Efficiency and Undergrounding Costs Changes BCR in Favor of Covered Conductor

In data request MGRA-01-Q9, MGRA requested that SDG&E provide an updated CBR workbook with no risk aversion making the following assumptions:

a. CCC risk reduction efficiency of 80%

b. SUG cost of $2.5 million per mile

c. CCC cost of $1.2 million per mile

d. Equal long term cost allocation between SUG and CCC for aviation firefighting, weather station maintenance, and emergency preparedness programs.

The file provided by SDG&E can be found on the M-Bar Technologies and Consulting, LLC GitHub repository.[71] Default costs for SUG used by SDG&E has been $2 million per mile, but so far SDG&E cost reductions have failed to reach this benchmark. Additionally, as SDG&E undergrounding moves into higher risk areas the landscape becomes more challenging, potentially offsetting economies of scale. The standard value for undergrounding cost used in other proceeding has generally been $3 million per mile, so the value used by MGRA is optimistic (on SDG&E's behalf). Likewise, the standard cost for covered conductor used in most proceedings has been $1 million per mile. The $1.2 million value was based on a review of recent SDG&E expenditures. Once again this is an optimistic value.

Regarding the 80% CCC reduction efficiency SDG&E's reply notes that:

"*The CCC mitigation effectiveness rate of 80% assumed by MGRA is unsupported and appears arbitrary when applied to SDG&E's service territory. This assumption diverges from SDG&E's own assessments, which are based on actual Evidence of Heat records (61.71%) and CPUC-reportable ignition data (70.11%). Additionally, MGRA's assumption of 80% contradicts its own analysis referenced in the Informal 2025 SDG&E RAMP Comments, where mitigation effectiveness in SCE's service territory, where more than 6,000 miles of covered conductor have been installed, was revised downward from 81% to 74.4% due to increased ignition events in 2024. While MGRA acknowledges potential inconsistencies in SCE's data, it is important to note that 2024, marked by dry conditions and extreme weather across Southern California, reflects a mitigation effectiveness of only 60%.*"[72]

As noted earlier, use of "evidence of heat" events is not an accurate representation of wildfire ignition risk. And while MGRA's estimate for SCE's data has dropped to 74% for covered conductor due to a re-evaluation by SCE, this value is still 10% higher than the value used by SDG&E. Additionally, SDG&E's risk analysis does not properly incorporate the risk reduction of FCP (shown above to be closer to 25% for drivers likely to cause catastrophic wildfires), and does not include the risk reduction from PEDS. SDG&E's BCR calculation also does not incorporate the risk reduction from PSPS. Taken together, SDG&E has estimated that these additional mitigations

[71] https://www.github.com/jwmitchell/Workpapers. Repository SDGERAMP25, file MGRA-SDGE-001_Attach_Q1-9_19428.xlsx
[72] DRR MGRA-SDGE-001-9.

raise the effectiveness of covered conductor to 97.7%.[73] In this context, use of an 80% ignition reduction efficiency is very conservative.

Regarding the final adjustment for long term cost allocation for various programs, regardless of the validity of MGRA's approach SDG&E's response to MGRA-SDGE-001-8 shows that the effect of this adjustment on the CBR is de-minimis.

With these very conservative estimates in play, SDG&E's comparison of the BCR for its covered conductor and undergrounding programs gives a very different result than what it has presented elsewhere, and that under these assumptions the CCC program generally has a higher BCR than SUG:

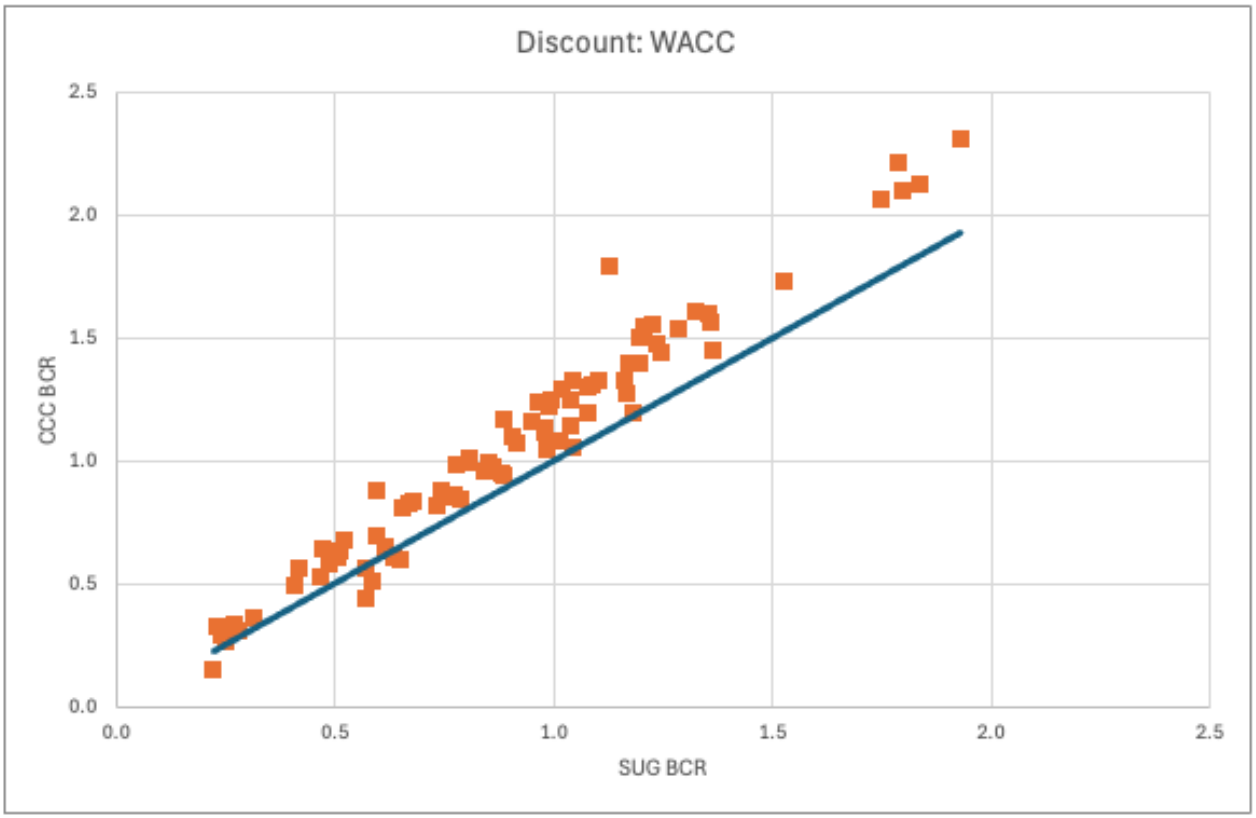


**Figure 9 –** Benefit-cost ratio using WACC discounting for covered conductor versus undergrounding. 'Each orange dot represents a Feeder-Segment BCR. Dots below the 1:1 ratio (blue line) indicate that the SUG BCR is greater than the CCC BCR. Conversely, orange dots above the blue line indicate that the CCC BCR is greater than the SUG BCR.' Values greater than 1.0 indicate that projected benefits outweigh costs.[74]

[73] SDG&E DRR MGRA-2026-8-04-13. See MGRA SDG&E 2026-2028 WMP Comments; Appendix A.
[74] Id.; Tab SUG&CCC_BCR plots.

**Recommendation:**

- SDG&E should provide worksheets in its GRC filing using higher CCC efficiencies taking into account higher FCP efficiency for catastrophic wildfire drivers and PEDS. 80% is the recommended value.

## 6. RAMP PROCESS ISSUES AND REQUESTED REMEDY

As noted in the introduction, the process followed in this RAMP varied from the standard process laid out in the four preceding RAMPs. This change introduced a number of novel procedural challenges and unknowns that may impact SDG&E's Reply, the contents of SDG&E's GRC filing and handling of RAMP comments, potential challenges to SDG&E's RAMP filing, and ultimately the Commission's final decision regarding SDG&E's revenue requirement and required safety mitigations.

Specifically, the timetable for previous RAMP proceedings added an additional few weeks for SPD to prepare its report. During that period, intervenors analyzing the RAMP filing and data request responses would file informal comments with SPD, which SPD then reviewed and used in their report and to target further investigations, and which SPD attached as appendices to its Report. Intervenors and SPD had in fact conferred this year to make a recommendation regarding the schedule. The schedule requested by intervenors and amenable to SPD was not adopted, and instead a schedule roughly equivalent to SDG&E's proposed schedule was put forth in the Scoping Memo.

### 6.1. Impacts of the RAMP Process Changes on the GRC

The RAMP process change has a number of effects, detailed in the table below:

| Difference from Previous RAMPs | Impacts of Change |
|---|---|
| Informal comments no longer part of process | • Required 6 weeks in advance of SPD report<br>• SPD does not get the benefit of complete intervenor input, which it has used often in previous RAMPs.<br>• Sempra has less time to respond to intervenor input in its comments. |

| | |
|---|---|
| | • Intervenors must include all supporting comment and data in comment submission. |
| SPD has 3-4 weeks less to prepare report. | • SPD had less time to issue data requests<br>• Intervenors provide less substantive input to SPD<br>• SPD had less time to conduct full analysis. |
| SPD report out earlier | • Intervenors have additional time for data requests following up on SPD Report.<br>• Sempra has additional time to prepare comments. |
| SPD does not refer to intervenor coments in the proceeding | • Fewer issues of joint concern that Sempra must respond to.<br>• Less duplication of effort between SPD and intervenors.<br>• Sempra must incorporate intervenor input in order for substantive intervenor contribution to be demonstrable. |
| RAMP Schedule completes 3 weeks earlier. | • Sempra has an additional 3 weeks to incorporate input into its GRC filing. |

**Table 8 –** Differences between the current RAMP proceeding and previous RAMP proceedings and the procedural impact of those differences.

As is evident from the table, not all consequences of the change to the RAMP process in the current Scoping Memo were negative. Intervenors have had more time to analyze the RAMP proceeding and issue data requests. Potential duplication of effort between SPD and intervenors has been reduced. Sempra also has additional time to incorporate RAMP input into its GRC.

Nevertheless, there are several consequences that can have potentially negative impacts on the GRC process. SPD has been put at somewhat of a disadvantage, having been given not only less time to do its work but also lack of the benefit of "extra eyes" provided by the intervenors. Intervenor and SPD positions when they have aligned in the past have been synergistic and more often result in utilities making improvements in their GRC filings. One important point for intervenors is that without feedback on their input from SPD, the determination of whether intervenor contributions to the RAMP process are substantive and therefore compensable is entirely determined by whether Sempra addresses them in a substantive way in its GRC filing. If Sempra merely dismisses intervenor RAMP input in its GRC filing regardless of merit, there will be nothing in the record demonstrating that the contribution was substantive and thereby make it challenging for intervenors to claim and receive compensation. If this turns out to be the case in this proceeding, it will discourage participation by intervenors in future RAMP proceedings.

RAMP proceedings are usually non-determinative, and the acceptance of RAMP filings in the GRC decisions have in the past been pro-forma. However, if issues raised in the RAMP are not properly addressed in the GRC filing it may be necessary to re-litigate those issues in the GRC, obtain additional filings by Sempra, or at worst object to the admission of Sempra's RAMP review and input. Any of these would lead to additional expenditure of time and expense and potentially delay the GRC proceeding. However, these potential issues can be avoided if preventative action is taken in the present proceeding.

### 6.2. Requested Remedy

One case in which a RAMP proceeding had tangible effect on the RAMP filing is in last year's PG&E GRC proceeding, in which the ALJ ruled that PG&E needed to include both scaled and unscaled risk models in its GRC filing.[75] The PG&E Ruling first presented a summary of findings by SPD and all intervenors. It then required SDG&E to address four "areas of deficiency" in its RAMP when it files its GRC application by:

- requiring a parallel risk evaluation using risk-neutral linear risk scaling,
- identifying regulatory requirements for each risk mitigation program/project,
- providing a parallel set of reliability cost calculations using a disaggregated approach, and
- removing risk tolerance as a justification for mitigation selections.

This ruling had the salutary effect of improving PG&E's GRC filing by including additional information and clarification of issues identified in the RAMP as incomplete or problematic.

MGRA therefore suggests that a similar approach be taken in the current proceeding in cases where significant evidence suggests that SDG&E's RAMP filings, models, and responses are erroneous, incomplete or unclear. The ruling should not be considered a finding of the factual evidence of information in SDG&E's RAMP filing, but merely a requirement that SDG&E provide additional clarification, explanation, and data in its GRC filing. By placing the additional

[75] A.24-05-008; ADMINISTRATIVE LAW JUDGE'S RULING TO PACIFIC GAS AND ELECTRIC COMPANY DIRECTING THE SERVICE OF ADDITIONAL INFORMATION AND OTHER REQUIREMENTS; April 22, 2025.

information into the GRC filing itself, a "deficiency" ruling leads to a more complete evidentiary record and prevents unnecessary delays and effort that would be required for intervenors and Cal Advocates to obtain the information from SDG&E through data requests. It also demonstrates for the record issues where intervenors made substantive contributions.

The Ruling should find, at the least, the following areas of deficiency, described in detail in the previous sections:

- SDG&E should provide a version of its HTM tranching that addresses issues raised by SPD,
- SDG&E should demonstrate that it is prioritizing high risk circuits in its selection of circuits for mitigation,
- SDG&E should provide an effective CMI for commercial customers,
- SDG&E should provide an alternative mitigation using utility-owned backup power for residential and commercial customers in areas with frequent PSPS for comparison to undergrounding.
- SDG&E should be required to provide external references supporting its claim that its risk scaling function is applicable to financial and reliability risks and not only safety risks,
- SDG&E should provide parallel risk and CBR calculations with and without its risk scaling function,
- SDG&E should provide parallel risk and CBR calculations with and without use of "evidence of heat" events to calculate ignition risks,
- SDG&E should provide parallel risk and CBR calculations using higher efficiencies for covered conductor based on higher FCP efficiency and PEDS reduction in ignitions.
- SDG&E should describe its progress in developing (and include if completed) a probability of failure model that includes wind-dependent damage to infrastructure other than conductors and to vegetation.

Including this additional information will help eliminating points of contention in the General Rate Case and lead to a more streamlined process and more rapid conclusion. It will also

recognize substantive input from intervenors in the record and not leave it to the sole discretion of Sempra.

MGRA also requests that the Ruling allow intervenor hours spent on the RAMP proceeding to be carried forward into SDG&E's GRC proceeding, as the ultimate ratepayer benefit of intervenor contributions will become most clear after the rate case is resolved. This has been allowed in all previous GRC cycles as well, and there is precedent for it. Nevertheless, given the significant changes to the RAMP process it would be beneficial to make the Commission's position clear for the record.

## 7. CONCLUSION

These comments are provided primarily to provide SDG&E with additional input for the preparation of its 2028 GRC. Because for the first time SPD comments predate intervenor comments, the current comments contain substantive information for the record. In order to ensure that the General Rate Case can proceed without disruption due to RAMP acceptance issues, MGRA respectfully requests that the Commission issue a formal ruling specifying additional information that needs to be included in SDG&E's GRC filing.

Submitted this 17th day of November, 2025,

By: __*/S/*____***Diane Conklin***_____

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# APPENDIX A – MGRA INFORMAL COMMENTS

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

| Application of San Diego Gas & Electric Company (U 902 M) to Submit Its 2025 Risk Assessment and Mitigation Phase Report. | Application A.25-05-013<br>(Filed May 15, 2025) |
|---|---|

# MUSSEY GRADE ROAD ALLIANCE INFORMAL 2025 SDG&E RAMP COMMENTS


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Dated: August 22, 2025

# 1. INTRODUCTION

These informal comments are being provided to SPD to facilitate the development of their RAMP report. While there was little time between the issuance of the scoping memo and the effective seven-week lead time needed by SPD for effective evaluation of intervenor comments for the preparation of new material, MGRA developed a wealth of information in its review of SDG&E's 2026-2028 Wildfire Mitigation Plan, and these comments summarize and provide a guide to MGRA's key findings.

MGRA respectfully requests that to the extent that SPD uses MGRA materials from the WMP that it cites to those materials.

These comments have been prepared by MGRA's expert witness Joseph W. Mitchell, Ph.D.

# 2. WILDFIRE MITIGATION PLAN RESULTS

The SDG&E 2026-2028 Wildfire Mitigation Plans were extensive and detailed, and importantly seem to be operating from the same technical assumptions as the RAMP filing, being separated by only a month or so. MGRA's DR1, due out August 27, will verify whether there are significant differences between the WMP and RAMP filings, assuming SDG&E's response is complete.

## 2.1. MGRA WMP R0 Comments

MGRA WMP Comments and associated data request responses may be found here: https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=58684&shareable=true

Highlights, taken from Section 1.3

- SDG&E's "risk averse scaling function" artificially amplifies risk, on the average by a factor of 7 and sometimes by a much greater factor. It also amplifies the difference in calculated residual risk between covered conductor and undergrounding. While basing its approach on findings in the available literature SDG&E errs significantly

in applying an exponentially increasing aversion function to financial losses and not solely fatalities.

- SDG&E's wind gust correction applied to its ignition rate is flawed and applied to the wrong drivers. It also does not take into account the increased frequency of outages under high wind that can lead to ignition.
- SDG&E has correctly increased its wildfire simulations to 24 hours, but its conversion of structures burned to potential fatalities is based on outdated wildfire histories and needs improvement.
- SDG&E has introduced what may be a sophisticated egress model but does not explain whether or how its results are incorporated into its risk framework.
- SDG&E has removed wildfire smoke fatality projections from its consequence model. It should improve and reincorporate a wildfire smoke consequence model.
- Damage was caused to SDG&E infrastructure during the December 2024 PSPS event. This damage, much of it to cross arms, did not occur on circuits that fall in SDG&E's top risk tiers.
- PSPS frequency, scope, and duration can be significantly reduced by raising wind gust thresholds after the installation of covered conductor. This should be incorporated into risk modeling.
- For estimated reliability consequences, SDG&E may be using a much smaller ratio between residential and commercial customers than was used by PG&E or supported by the ICE 1.0 model.
- For the circuits SDG&E proposes for mitigation in the 2026-2028 period, neither undergrounding nor covered conductor has a BCR > 1.0 unless SDG&E applies its faulty "risk averse scaling function" and other questionable assumptions. Its 55 year apportionment of O&M costs needs to be closely examined.

### 2.2. SDG&E Reply to MGRA Comments

SDG&E's reply comments may be found here:
https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=58763&shareable=true

Highlights:

- SDG&E vigorously defends its "risk-averse" function, accusing MGRA of confirmation-bias and justifying applying risk aversion to financial losses as well as safety.
- SDG&E defends its estimates of covered conductor efficacy, stating that the use of non-reportable ignitions supports its lower value.
- SDG&E argues that using SCE's covered conductor deployment as a proxy for its service area is inappropriate.
- SDG&E claims that its egress model is correctly incorporated into its WiNGS-Planning model and rejects the prospect of using it for operational planning as well.
- SDG&E agrees that there is an issue with "PSPS blindness" but claims that its model compensates for this risk by amplifying consequences in high wind areas.
- SDG&E rejects MGRA's suggested improvement to its wind gust correction.
- SDG&E also argues against MGRA's observation that it errs in applying wind gust corrections to drivers that do not have causal relationship to wind. SDG&E provides data showing that risk events from animals and vehicles have higher consequence in high wind areas.

### 2.3. OEIS Rejection of SDG&E WMP R0

Energy Safety rejected SDG&E's 2026-2028 WMP R0 filing:
https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=58774&shareable=true

Highlights:

There were numerous deficiencies noted but of special relevance to MGRA filings are the following:

- Energy Safety required SDG&E to report risk reduction at a service territory level rather than per circuit level. This turns out to be very important to MGRA's R1 comments.
- Citing MGRA, OEIS noted an area of additional concern:
  "b. *SDG&E used an effectiveness for reducing overall risk of 58% for combined covered conductor, which includes additional equipment replacements and installations,32 compared to 99% for strategic undergrounding.33 Previously, SDG&E estimated covered conductor alone to have an effectiveness of 64.5%,34*

*which did not include the benefits of additional mitigations. Additionally, when considering benefits from early fault detection (EFD), falling conductor protection (FCP), and PSPS, SDG&E estimated a 97.78% reduction in risk.35 SDG&E did not provide justification as to why it decreased its effectiveness estimates for covered conductor despite including additional mitigations. SDG&E also stated that it calculates the effectiveness for combined covered conductor based on the baseline condition of the asset,36 but did not use the same methodology for undergrounding*."

35 MGRA Comments, SDGE Response MGRA-2026-8-04, Question 13.

36 MGRA Comments, SDGE Response MGRA-2026-8-04, Question 9.

### 2.4. MGRA Comments on SDG&E 2026-2028 WMP R1

Citing a number of factors, MGRA made the strong recommendation that OEIS reject SDG&E's R1 filing. This had not been a recommendation of MGRA's original comments. The fundamental reason for the recommendation was that once SDG&E had ranked its circuits by its new HTM tier it was clear that one of the main reasons that overall buydown of risk was much greater for undergrounding than covered conductor was that SDG&E appears to be holding back high risk circuits for undergrounding.

https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=59121&shareable=true

Highlights:

- In its R1 revision, SDG&E estimate of risk reduction per mile is 8X larger for undergrounding than it is for covered conductor. This is true for both neutral and risk averse scaling.
- SDG&E's new "HTM" tier calculation appears to be a positive step because it allows ordinal ranking of tiers.
- Circuit segments that SDG&E proposes for undergrounding are in a higher risk tier than the circuits it proposes for covered conductor.
- If the circuit segments assigned to undergrounding and covered conductor are swapped, the risk reduction per mile is twice as large for covered conductor as for undergrounding, reversing the relationship.

- MGRA is concerned that SDG&E is "tabling" risk – holding off mitigating high risk circuits until its SB 884 EUP is approved.
- SDG&E seems to have allocated some long term strategic costs (aerial firefighting, emergency preparedness and recovery, weather station) to apply to the covered conductor program only. MGRA suggests these are general programs wildfire mitigation programs applying to the service territory.
- MGRA shows that inclusion of "evidence of heat" non-reportable events has statistically different driver probability distributions than reportable ignitions, with a much higher contribution from drivers classed as "Other". MGRA therefore argues that this sample does not accurately represent wildfire events. The difference accounts for the 10% lower covered conductor efficacy that SDG&E reports compared to its sibling utilities.
- SDG&E's calculation of combined effectiveness is not accurate because FCP efficacy correlates with covered conductor efficacy. FCP is effective for specific drivers such as tree fall-in to which covered conductor is vulnerable.
- MGRA notes that where any parameter has any degree of freedom, and for some where it is stretching credulity, SDG&E chooses to insert numbers that favor undergrounding. This is the primary reason that MGRA recommends rejecting the R1 WMP.
- For example, SDG&E assumes an undergrounding cost of $2 million per mile, which it has not yet achieved.

### 2.5. SDG&E Reply to MGRA R1 Comments

SDG&E took strong exception to MGRA's comments and urged them to be disregarded.

https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=59197&shareable=true

Highlights:

- SDG&E shows risk calculations for circuits mitigated in the 2023-2024 timeframe that indicates the majority of the circuit miles mitigated were in the top 20 risk ranked circuits according to WiNGS-Planning version 3.

- SDG&E claims that circuit hardening is planned years ahead and that circuits cannot be "pivoted".
- There are other considerations to recommendations, such as feasibility, bundling efficiency , and maximum wind gust.
- SDG&E mitigates circuits using PSPS and maintenance prior to hardening.
- SDG&E correctly points out that I made a large miscalculation of risk aversion by applying scaling to the overall cost rather than the $16 million VSL. SDG&E recalculates the effective aversion cost from the Eaton fire example used by MGRA and shows that the $10 billion estimated property loss from the Eaton fire would be increased to $210 billion with risk aversion applied.
- SDG&E points out that long term foundational costs represent only 15% of the total for CCC segments and 6% of the costs for SUG, with the rest of the CCC cost deriving from O&M expenses such as vegetation management and inspections.
- SDG&E maintains that it is valid to include "evidence of heat" event, showing example photographs of charring that did not result in a reportable ignition. SDG&E states that the efficacy of CCC rises to 70.1% if reportable ignitions alone are used.

**2.6. Discussion of Issues Raised in WMP Reviews**

I remain skeptical that SDG&E's calculations showing a lower BCR for covered conductor than for undergrounding are valid. While SDG&E's comments accuse MGRA of an anti-undergrounding bias and of confirmation bias, SDG&E's comments smack of projection. MGRA's long-term mission has been the reduction of utility wildfire risks in a cost-effective way. Undergrounding is extremely effective, and it is only because it is extremely expensive and that California is in the middle of a utility rate affordability crisis that other options need to be evaluated. In previous RAMP, GRC, and WMP filings MGRA pointed out the correlation between life expectancy and income, and showed that for low income ratepayers, utility rates are in the range where differences in mortality are observed. If these are causal (and it is not clear they are) then impacts of high utility rates could result in more human life and health impact than wildfires. While the Commission has never adopted this analysis, the recent PD in the SCE rate finds that the "*data and analysis presented by the parties to be a useful backdrop against which to evaluate SCE's*

*individual GRC requests*,"[1] and subsequently reduces SCE's revenue requirement by scaling back its proposed undergrounding program.

So while consideration of rates is outside of SPD's and RAMP purview, the question of rates cannot be completely decoupled from risk because of the introduction of BCR as a cost-effectiveness metric. The question of BCR is likely going to be the determinative factor in the decision regarding how much of an undergrounding program to support.

To summarize MGRA's conclusions in light of SDG&E's replies:

### 2.6.1. Risk Banking

It does appear that SDG&E is "tabling" or "banking" high risk circuits with the expectation that it will be easier to get approval for their undergrounding through an EUP application than through a GRC application. The data and denials in SDG&E's replies do not speak to the central issue. While SDG&E prioritized high risk circuits in 2023 and 2024, the years in question are 2025-2030. There was no potential for an EUP in 2023 through 2024, and these circuits were hardened before the most recent SDG&E GRC decision cut back SDG&E's undergrounding program. Also, the arguments about difficulties in shifting planning are irrelevant. MGRA's analysis was not an alternative proposal, but rather an analysis of what would have been if SDG&E had set its priorities differently. In the event that SDG&E is making long-term commitments based on faulty or biased calculations, it will be SDG&E's responsibility to correct its spending priorities to ensure adequate protection of residents.

### 2.6.2. Risk Aversion

Upon any reasonable review is clear that SDG&E's risk averse scaling function goes well beyond anything justified in the literature it cites, literature which applies only to fatalities. Applying risk aversion to economic losses makes no sense, as SDG&E's projected cost of $210 billion for the Eaton fire shows – a factor of 20 more than the estimated $10 billion from property loss. While utilities are allowed to use risk-averse scaling, SPD should become involved in setting

[1] A.23-05-010; Proposed Decision; July 28, 2025; p. 35.

some strictures around it because scaling affects the BCR. For one thing, it should be required that any presentation of risk and BCR in the GRC be accompanied by an equivalent risk-neutral calculation. The possibility of limiting risk-aversion to fatalities as has been done in other industries was explored in the MGRA WMP comments. This would result in more modest risk estimates.

### 2.6.3. Efficacy of Covered Conductor and Other Mitigations

MGRA has been tracking the efficacy of covered conductor deployed by SCE for a number of years, since SCE has actually deployed enough covered conductor to track this with some statistical significance. During this year's WMP cycle, however, SCE was unable to provide data that was consistent with that provided in previous years, which had led to a conclusion that covered conductor was 81% effective in reducing wildfire ignitions. Due to differences in the data set and an increase in ignitions in 2024, the calculated value is now 74.4%.[2] This is still significantly higher than the CCC value quoted by SDG&E, which purportedly also includes Falling Conductor Protection.

It also needs to be emphasized that wildfire risk is also reduced by PSPS and PEDS, which combined with CCC as Energy Safety's rejection notes can increase risk efficiency up to 97%.

Additionally SDG&E's new methodology for calculating efficiencies using non-reportable ignitions is inappropriate. In general larger data samples are better, but the larger sample is statistically different from the reportable ignition sample in several ways, and the ways it is different are not historically responsible for wildfires. The photos SDG&E showed would not have been classified as "Other", the driver mostly responsible for the difference in calculated CC efficacy. SPD shouldn't accept this methodology, which MGRA's R1 Comments show through statistical analysis is incorrect and biased.

### 2.6.4. Risk Calculations

SDG&E's ignition risk calculations remain flawed, which is a shame because they are not so far from doing it in a reasonable way. MGRA's WMP comments suggested an improved method for

[2] MGRA Comments on SCE 2026-2028 WMP; p. 44.
https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=58804&shareable=true

calculating probability of ignition and we'll be repeating that in the RAMP. SDG&E is adjusting for wind, but mostly on the consequence side, which isn't where the big impact comes from. High wind exponentially increases the fault rate, and therefore potential ignition rates.

For SDG&E's consequence model they and the other IOUs have now all shifted to 24 hour runs of the Technosylva simulation, as MGRA has been urging for several years.

The only real test of wind sensitivity is PSPS damage and SDG&E is not incorporating this into its risk calculations yet. Of special note is that PG&E's PSPS damage events had a very good correlation with their circuit risk estimation.[3] SCE's didn't, but almost all of its PSPS damage were in or near its "High Wind" designated IWMS areas.[4] SDG&E's PSPS damage is not on its highest risk circuits, and this is a concern.

Finally, SDG&E has eliminated its wildfire smoke health effect correction from its risk calculation. As critical as I've been of their calculation, which I still maintain makes a straightforward mathematical error, adjusting for wildfire smoke is much "less wrong" than ignoring it entirely, even if the calculation has a lot of guesswork. Previous MGRA RAMP informal comments, particularly SDG&E's last RAMP, had a detailed analysis of wildfire smoke, and SPD has in the past supported the inclusion of wildfire smoke health effects in risk models. More people may have died from wildfire smoke from utility wildfires than died directly from the fires. It's surprising that SDG&E would go out on a limb to amplify its risk calculation using an ill-supported "risk averse" function but doesn't want to adjust safety risk upwards using wildfire smoke, which would be more supportable from a technical standpoint.

### 2.6.5. Lifecycle Costs

Lifecycle costs are going to be central to the RAMP and GRC proceedings, and are where SPD should pay particular attention. Despite the fact that they are not directly "safety" related, they are inputs to the BCR and are, based on all the analysis I've done so far, the primary driver reducing

[3] MGRA Comments on the PG&E 2026-2028 WMP Comments; p. 53.
https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=58534&shareable=true
[4] MGRA Comments on the SCE 2026-2028 WMP Comments; p. 34.
https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=58804&shareable=true

the CCC BCR. While SDG&E does assign some long term capital costs against covered conductor that it shouldn't, it correctly states that the primary costs come from O&M. Understanding and validating SDG&E's lifecycle costs is the hill where the undergrounding/CC battle is going to be fought, and all inputs need to be checked. Cal Advocates, supported by MGRA and TURN, is trying to get data on the following items that are not included in SDG&E's lifecycle costs:

1. Annual capital rate of return costs paid for by ratepayers.
2. Annual income taxes on capital rate of return paid for by ratepayers.
3. Annual property taxes.
4. Other capital-related costs including:
    a. Depreciation, including negative salvage value.
    b. Asset retirement Costs.

SDG&E has made so many questionable and potentially biased choices in its selection of data and methods that its claim that lifecycle costs increase the cost of covered conductor to more than that of undergrounding needs to be carefully scrutinized. Even if SDG&E prevails on this issue in the RAMP, its victory may be Pyrrhic in the GRC and EUP. A lower BCR for covered conductor may not be interpreted by the CPUC as "*let's do more undergrounding*" but rather as "*let's do less hardening*" due to the extreme affordability crisis currently being faced. It may mean in the longer term a higher tolerance for long-term dependence on PEDS and PSPS, which have been extremely effective in preventing wildfires under worst-case conditions.

## 3. DATA

MGRA did a number of analyses supporting its WMP review. Raw excel files were downloaded directly from the SDG&E FTP site, and you can see what I requested in the data requests attached as an appendix to the MGRA WMP R0 and R1 comments. Analyzed versions of these files were saved separately and these were posted to Github along with originals at the same time the MGRA comments were filed:

https://github.com/jwmitchell/Workpapers/tree/main/WMP26/SDGE

## 3.1. Key Data Files for SDG&E WMP

### 3.1.1. SDGE Response MGRA-2026-8-03_Q06-OEIS-Table-4-3-jwm

This analysis calculates the return-on-investment time for undergrounding assuming the ICE 1.0 model and using number of customers on each SDG&E circuit segment.

### 3.1.2. SDGE Response MGRA-2026-8-05_Q2_AppendixG-jwm-RN-Eff

See the section "How to Hack SDG&E 'Main Workbook' Files".

Appendix G is equivalent to "Main Workbook" supplemental files in the SDG&E RAMP. While these workbooks have calculations enabled, these are effectively disabled so that changes to base parameters don't percolate into the workbooks. I've fixed that. Additionally, I come up with a way to approximate the effect of covered conductor efficacy on a circuit-by-circuit basis by scaling the CC efficacy against the UG efficacy. This only will work for unscaled risk calculations.

### 3.1.3. SDGE_Wildfire_Fatality_Structures_ratios_2025_05_12_0-jwm

This analysis examines how SDG&E determines the fatality rate used for its safety attribute. SDG&E's calculation is based on historical wildfire data, and if this is screened to use only historically relevant data (since 1990) the fatality rate drops by about 30%.

### 3.1.4. SDG&E_2026-2028_Base-WMP_Appendix G Supporting Data_R1-jwm

Used for plotting the HTM tier plots for undergrounding versus CCC in the MGRA R1 Comments, showing CC circuits come from lower risk tiers than UG circuits.

### 3.1.5. SDG&E_2026-2028_Base-WMP_SDGE Tables_R1-jwm

Statistical analysis showing that drivers for reportable ignitions and ignitions including "evidence of heat" event do not come from the same statistical distributions. See tab Table-6-10-11. Also uses Python file Chi2-Table-6-10-11.

### 3.2. Weather Analysis

A weather analysis was also done for SDG&E PSPS damage events to determine the maximum nearby wind gust speed in the 72 hours prior to the damage report.

This analysis is the Github directory:

https://github.com/jwmitchell/mbar-weather/tree/main/examples/WMP2026

Output Excel file (processed) is SDG&E_PspsEventDamagePoint_2024X.xlsx.

### 3.3. How to Hack SDG&E 'Main Workbook' Files

Warning: In order to calculate using SDG&E's spreadsheets, one will need to have "live" Excel spreadsheets with calculated values, as is shown in MGRA's Appendix G file and in the Appendix G released by SDG&E for the WMP proceeding. The versions that SDG&E has been providing in its "Main Workbook" files are static value-only Excel entries. MGRA will be requesting a live workbook with cells based on formula calculations via data request but SPD should do the same.

SDG&E's tabular workpapers for risk calculation are highly transparent, at least those that include formulae instead of value entries. Their major limitation is that the calculated efficiencies for each circuit segment are individually calculated by the WiNGS-Planning risk analysis program. As a result, the tabular data for circuit segment risk reduction effectiveness is input as static entries rather than calculated entries. While an exact calculation requires SDG&E to set all of the inputs, a dynamic worksheet approximating the effect of changes to the line mile costs and to the projected CCC efficiency can be calculated. The method is described in MGRA's WMP R0 Comments:

"*Because there is proportionality between UG BCR and CC BCR, it is possible to create a scaling function that will approximately incorporate a user-defined CCC efficiency using by scaling the CCC risk by the UG risk (which is still determined by the WiNGS-Planning Monte Carlo). The*

*residual risk for CC using this approach is:*

*CC Risk = (CC Efficiency / UG Efficiency) * UG Risk*"[5]

This is done by adjusting the raw_WiNGS_Planning tab:

| | | |
|---|---|---|
| Column K | CCC Safety Risk Reduction | =N2/SUG!$K$10*CCC!$K$10 |
| Column M | CCC Financial Risk Reduction | =P2/SUG!$K$10*CCC!$K$10 |

Cell K10 is the risk reduction efficiency.

It is important to note that this approach only works for risk neutral scaling, because if risk aversion is applied risk reduction from undergrounding no longer has a linear relationship with risk reduction from covered conductor.

## 4. CONCLUSION

These comments are provided in the hope that they provide some areas for further SPD investigation and can provide the basis for additional SPD data requests. If there are any questions or need for further clarification further comment can be posted to the service list.

Submitted this 22nd day of August, 2025,

By: __*/S/*____***Joseph Mitchell***_____

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[5] MGRA SDG&E WMP R0 Comments; p. 60.

# APPENDIX B – MGRA DATA REQUESTS

**Data Request Number:** MGRA-SDGE-001

**Proceeding Name:** 2025 Risk Assessment & Mitigation Phase (RAMP)(TY 2028)

**Publish To:** Mussey Grade Road Alliance

**Date Received:** 08/13/25

**Date Responded:** 08/27/25

## GENERAL OBJECTIONS

1. SDG&E objects generally to each request to the extent that it seeks information protected by the attorney-client privilege, the attorney work product doctrine, or any other applicable privilege or evidentiary doctrine. No information protected by such privileges will be knowingly disclosed.

2. SDG&E objects generally to each request that is overly broad and unduly burdensome. As part of this objection, SDG&E objects to discovery requests that seek "all documents" or "each and every document" and similarly worded requests on the grounds that such requests are unreasonably cumulative and duplicative, fail to identify with specificity the information or material sought, and create an unreasonable burden compared to the likelihood of such requests leading to the discovery of admissible evidence. Notwithstanding this objection, SDG&E will produce all relevant, non-privileged information not otherwise objected to that it is able to locate after reasonable inquiry.

3. SDG&E objects generally to each request to the extent that the request is vague, unintelligible, or fails to identify with sufficient particularity the information or documents requested and, thus, is not susceptible to response at this time.

4. SDG&E objects generally to each request that: (1) asks for a legal conclusion to be drawn or legal research to be conducted on the grounds that such requests are not designed to elicit facts and, thus, violate the principles underlying discovery; (2) requires SDG&E to do legal research or perform additional analyses to respond to the request; or (3) seeks access to counsel's legal research, analyses or theories.

5. SDG&E objects generally to each request to the extent it seeks information or documents that are not reasonably calculated to lead to the discovery of admissible evidence.

6. SDG&E objects generally to each request to the extent that it is unreasonably duplicative or cumulative of other requests.

7. SDG&E objects generally to each request to the extent that it would require SDG&E to search its files for matters of public record such as filings, testimony, transcripts, decisions, orders, reports or other information, whether available in the public domain or through FERC or CPUC sources.

8. SDG&E objects generally to each request to the extent that it seeks information or documents that are not in the possession, custody or control of SDG&E.

9. SDG&E objects generally to each request to the extent that the request would impose an undue burden on SDG&E by requiring it to perform studies, analyses or calculations or to create documents that do not currently exist.

10. SDG&E objects generally to each request that calls for information that contains trade secrets, is privileged or otherwise entitled to confidential protection by reference to statutory protection. SDG&E objects to providing such information absent an appropriate protective order.

## II. EXPRESS RESERVATIONS

1. No response, objection, limitation or lack thereof, set forth in these responses and objections shall be deemed an admission or representation by SDG&E as to the existence or nonexistence of the requested information or that any such information is relevant or admissible.

2. SDG&E reserves the right to modify or supplement its responses and objections to each request, and the provision of any information pursuant to any request is not a waiver of that right.

3. SDG&E reserves the right to rely, at any time, upon subsequently discovered information.

4. These responses are made solely for the purpose of this proceeding and for no other purpose.

**Data Request Number:** MGRA-SDGE-001

**Proceeding Name:** 2025 Risk Assessment & Mitigation Phase (RAMP)(TY 2028)

**Publish To:** Mussey Grade Road Alliance

**Date Received:** 08/13/25

**Date Responded:** 08/27/25

MGRA-1-1 p.10 – "CMI is monetized using the LBNL ICE Version 1.0, calibrated with SDG&E-specific customer demographics historical billing and load information, regional economic measures, and utility historical reliability metrics as of year-end 2023, based on data availability".

a. Will SDG&E be using ICE 1.0 or ICE 2.0 for its GRC application next year?

**SDG&E Response MGRA-1-1.a.:**

SDG&E objects to the request on the grounds set forth in General Objections Nos. 3 and 5. Subject to and without waiving the foregoing objections, SDG&E responds as follows:

SDG&E aims to provide a reasonably accurate reliability valuation model that reflects the best available data at the time GRC inputs are prepared. Once a comprehensive evaluation of ICE 2.0 Phase 2 is completed, SDG&E will determine whether it meets this standard and will update its reliability assumptions accordingly.

MGRA-1-1 p.10 – "CMI is monetized using the LBNL ICE Version 1.0, calibrated with SDG&E-specific customer demographics historical billing and load information, regional economic measures, and utility historical reliability metrics as of year-end 2023, based on data availability".

b. Will SDG&E be using ICE 1.0 or ICE 2.0 for its EUP application?

**SDG&E Response MGRA-1-1.b.:**

SDG&E objects to the request on the grounds set forth in General Objections Nos. 3 and 5. Subject to and without waiving the foregoing objections, SDG&E responds as follows:

SDG&E is assessing the current regulatory requirements applicable to the EUP. If it elects to submit an EUP, SDG&E will present available information in support of its submission in conformity with regulatory requirements.

MGRA-1-1 p.10 – "CMI is monetized using the LBNL ICE Version 1.0, calibrated with SDG&E-specific customer demographics historical billing and load information, regional economic measures, and utility historical reliability metrics as of year-end 2023, based on data availability".

c. If the answer to a or b is "ICE 2.0"?

a) Is SDG&E currently evaluating and calibrating its monetized CMI with ICE 2.0?

**SDG&E Response MGRA-1-1.c.a.:**

SDG&E objects to the request on the grounds set forth in General Objections Nos. 3 and 5. Subject to and without waiving the foregoing objections, SDG&E responds as follows:

Yes, SDG&E is currently evaluating its monetized CMI using ICE 2.0 Phase 1. However, these values are extremely preliminary and subject to change upon implementation of ICE 2.0 Phase 2, which is currently slated for release by the end of 2025.

MGRA-1-1 p.10 – "CMI is monetized using the LBNL ICE Version 1.0, calibrated with SDG&E-specific customer demographics historical billing and load information, regional economic measures, and utility historical reliability metrics as of year-end 2023, based on data availability".

c. If the answer to a or b is "ICE 2.0"?

b) Can SDG&E provide an initial estimate of CMI values equivalent to Table 7 using ICE 2.0?

**SDG&E Response MGRA-1-1.c.b.:**

SDG&E objects to the request on the grounds set forth in General Objections Nos. 2, 3, 5 and 8. Subject to and without waiving the foregoing objections, SDG&E responds as follows:

No. ICE 2.0 Phase 1 did not include CA utility-specific data or provide full capability to update default values for industry specific usage. As a result, SDG&E cannot provide a reasonably accurate evaluation of the new ICE 2.0 Phase 1 model, as the results are extremely preliminary and subject to change.

**Data Request Number:** MGRA-SDGE-001

**Proceeding Name:** 2025 Risk Assessment & Mitigation Phase (RAMP)(TY 2028)

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MGRA-1-2 For PSPS safety planning: "To estimate the number of SIFs per de-energization, 1 fatality per 10 billion customer minutes de-energized is assumed based on a review of historical PSPS de-energizations in California (2018 to 2021)." SDG&E then cites three post-season de-energization reports from the major IOUs. Provide the calculation by which SDG&E obtains the 1 in 10 billion CMI value from the three cited references.

**SDG&E Response MGRA-1-2:**

To estimate the number of customer minute interruptions that would lead to a potential fatality, historical de-energization event data was collected from all three major California IOUs. Since no known recorded fatality events have been observed by the three IOUS that have been directly caused by the impact of customer minute interruptions, the total duration of customer minute interruptions was calculated across the historical event dataset for all three IOUs, equating a total of nearly 10B customer minute interruptions. As a conservative estimate, it was therefore assessed that a fatality could potentially occur imminently and thus a 10B customer minutes factor is used to convert customer minutes into fatalities to factor into calculating the PSPS Safety attribute. Please see below table for the IOU specific historical event data used to estimate this factor.

**Historical PSPS de-energizations in California (2018 to 2021):**

| IOU | Customer Deenergized | Total Duration | AVG PSPS duration per Customer (minutes) | AVG PSPS duration per Customer (hour) | Fatality Rate per customer minutes | 1/Fatality |
|---|---|---|---|---|---|---|
| **SDG&E** | 149,929 | 238,884,560 | 1,593.32 | 26.56 | 4.2E-09 | 2.4E+08 |
| **PG&E** | 2,797,663 | 8,634,274,650 | 3,086.25 | 51.44 | 1.2E-10 | 8.6E+09 |
| **SCE** | 604,661 | 1,018,407,222 | 1,684.26 | 28.07 | 9.8E-10 | 1.0E+09 |
| **Total** | 3,552,253 | 9,891,566,432 | 2,784.59 | 46.41 | 1.0E-10 | 9.9E+09 |

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MGRA-1-3 Regarding SDG&E wind gust corrections to SDG&E ignition rates, is the answer provided in WMP SDG&E DR responses MGRA-2026-8-03-Q2 and MGRA-2026- 8-04-Q2 still accurate and apply to the WiNGS-Planning model used in the RAMP?

a. If the answer is "no" please provide updated technical information relevant to the RAMP submission

**SDG&E Response MGRA-1-3:**

SDG&E objects to the request on the grounds set forth in General Objections Nos. 3 and 5. Subject to and without waiving the foregoing objections, SDG&E responds as follows:

Yes, the answer provided in WMP SDG&E DR responses is still accurate; however, it is not associated with WiNGS-Planning.

First, the terminology "wind gust corrections" is not used or defined in SDG&E's 2026-2028 Base WMP. SDG&E objects to any mischaracterization or reinterpretation of its terminology by external parties.

Second, questions from MGRA-2026-8-03-Q2 and MGRA-2026- 8-04-Q2 pertain to Section 3.4 and OEIS Table 3-1. The risk driver analysis presented in the aforementioned data request responses is a broader risk portfolio assessment developed in response to the data requirements outlined in the OEIS guidelines. This analysis is not derived from, informed by, or connected to the WiNGS-Planning model. On the contrary, it is based on the methodology described in Section 3.4, which ranks risk drivers by quantifying wildfire-related factors at the locations where overhead faults were observed.

This analysis helps to identify correlations between driver types (fault types) and wildfire risk factors at specific utility asset locations. For example, if certain driver types often occur in areas with low wildfire risk and consequence, the method distinguishes these from driver types that occur less frequently but are more common in high-risk areas.

a.

WiNGS-Planning uses annual ignition rates for all ignition causes as a normalization parameter to its span-level probability of ignition outputs. There is no additional updated technical information relevant to the RAMP submission.

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MGRA-1-4 Is Table 4 (SDG&E-Risk-4) consistent with the WiNGS-Planning technical information provided in SDG&E's 2-26-2028 Wildfire Mitigation Plan? If not please provide all additional technical information on the wildfire related Risk Event Models.

**SDG&E Response MGRA-1-4:**

Yes, Table 4 is consistent with technical information provided about the WiNGS-Planning model in SDG&E's 2026-2028 Base WMP filing.

Note: While responding to this data request, SDG&E noticed that the description for the Pole/Span Conditional Probability of Ignition sub-model is an outdated description tied to a previous version of the WiNGS-Planning model. The correct current Model Description for Pole/Span Conditional Probability of Ignition in Table 4 (SDG&E-Risk-4) is "Estimates the likelihood and frequency of an electrical outage leading to an ignition within the service territory."

MGRA-1-5 Table 4 differentiates between likelihood of ignition and likelihood of wildfire. Please provide a technical description of how likelihood of wildfire is related to likelihood of ignition, especially in regard to wind gust data. Is the wildfire likelihood calculation a conditional likelihood?

**SDG&E Response MGRA-1-5:**

See Note detailed in response to MGRA-1-4, regarding Table 4 correction.

As it pertains to the WiNGS-Planning model as referenced in Table 4 of SDGE-Risk-4 Wildfire and PSPS, the Wildfire Likelihood sub-model is a derivative of the various Probability of Failure (POF) sub-models, as well as the Pole/Span Conditional Probability of Ignition (POI) sub-model. The Wildfire Likelihood model leverages conditional probabilities from the Pole/Span Conditional POI sub-model.

The POF and the Pole/Span Conditional POI are assessed using probabilistic assumptions based off of Bayes Theorem to estimate the POI associated with each of the POF failure modes. The summation of all individual POF x Conditional POI estimates for each failure mode is therefore the total POI for a given span or pole.

The Wildfire Likelihood is comprised of taking an annual aggregated summation of individual 10-min interval POI values from a representative 2-year historical period of predictions (2020, 2024) and normalizing the summation across the territory to annual historical ignition rates. Historical wind speeds are inputs into the POF sub-model predictions across that 2-year historical period. The normalized POI rate is then leveraged as a weighted factor within the Monte Carlo event simulation framework at the span-level, to simulate a probabilistic estimate of risk event locations across 5M years of simulations.

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MGRA-1-6 Provide a table equivalent to Table F-2 showing estimated ignition reduction for Falling Conductor Protection (FCP) as a function of Distribution Risk Driver, in both pdf and Excel formats.

**SDG&E Response MGRA-1-6:**

SDG&E objects to the request on the grounds set forth in General Objections Nos. 2, 3, 5 and 8. Subject to and without waiving the foregoing objections, SDG&E responds as follows:

SDG&E does not currently calculate ignition reduction values per driver for the Falling Conductor Program using empirical data. There is currently insufficient field data to support a comprehensive, data-driven analysis at this time based on evidence of heat records, or CPUC Reportable Ignition records. Instead, SDG&E estimates risk reduction for the program based on subject matter expert assumptions, primarily linking reductions in outage risk to potential ignition mitigation. Please refer to attached file "MGRA-SDGE-001_Attach_Q1-6" with SDG&E's current methodology.

**Data Request Number:** MGRA-SDGE-001

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MGRA-1-7 Are SDG&E's calculations provided in CBR Main Workbook provided in the response to DR SPD-12 consistent with the latest workbooks provided as Appendix G in SDG&E's WMP (R1)? If not what are the key differences?

**SDG&E Response MGRA-1-7:**

The sheets provided in DR SPD-12 are aligned with WMP R1 Appendix G in all ways except for the following:

- Scoped years
    - App. G: 2026-2028
    - SPD-12: 2025-2031
- SUG mile targets
    - App. G: 69.56 (2028 only)
    - SPD-12: 229.64 (2028 only), 934.44 (total 2028-2031)
- CCC mile targets
    - App. G: 31.28 (2028 only), 142.8 (total 2026-2028)
    - SPD-12: 191.37 (2028 only), 778.7 (total 2028-2031)
- Baseline Risk Year
    - App. G: 2025
    - SPD-12: 2024
- The SPD-12 workbook contains alternative sheets for CCC (CCC_RA_RAMP_2025_2027, CCC_RA_RAMP_Alt2) and SUG (SUG_RA_RAMP_2025_2027, SUG_RA_RAMP_Alt1) which contain scopes and alternate scopes for 2025-2027. Appendix G contains no such alternate sheets.
- The SPD-12 workbook contains tranche mapping, tranche BCR, and tranche BCR by year summary sheets that are not contained in Appendix G.

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MGRA-1-8 SDG&E's workbooks assume a 55 year long-term foundational cost for both SUG and CCC. SDG&E's Table 6-3 of its WMP shows how different mitigation program costs are allocated for SUG and CCC. Provide a table and diagram showing how changing the following assumptions regarding how program costs are allocated affect the long-term overall per mile costs for covered conductor and undergrounding, showing both with and without the following adjustments:

a. Assume equal cost allocation per mile for:

a) Aviation firefighting

b) Weather Station Maintenance and Calibration

c) Emergency Preparedness and Recovery

**SDG&E Response MGRA-1-8:**

SDG&E objects to this request to the extent that it would impose an undue burden on SDG&E by requiring it to perform studies, analyses or calculations or to create documents that do not currently exist. SDG&E further objects to this request to the extent it seeks information or documents that are not reasonably calculated to lead to the discovery of admissible evidence. SDG&E further objects to this request on the grounds that it misstates facts and/or assumes facts that do not exist. Specifically, this request is based on inaccurate and unsupported representations of the appropriate long-term cost allocations between SUG and CCC. Subject to and without waiving the foregoing objections, SDG&E responds as follows:

SDG&E's long-term capital and O&M foundational cost allocations are based on a logical assessment of which activities and associated costs would remain, or potentially increase, under different deployment scenarios, such as Combined Covered Conductor (CCC) or Strategic Undergrounding (SUG). For example:

- The cost allocation for the Aviation Firefighting Program is firmly grounded in operational realities and supported by historical data. Strategic Undergrounding is widely recognized to reduce ignition risk by 98–99%. Due to the enclosed nature of underground systems, the likelihood of an ignition escalating into a large, uncontrolled fire is extremely low. Moreover, historical data, including CPUC-reportable ignition records and Evidence of Heat documentation, consistently show minimal fire risk associated with underground assets. Therefore, allocating 100% of aviation firefighting program costs to overhead assets is both logical and evidence-based. Assigning any portion of these costs to underground infrastructure would be inconsistent with its physical characteristics, unsupported by empirical data, and methodologically unjustifiable.

**SDG&E Response MGRA-1-8:Continued**

- Weather Station Maintenance and Calibration and Emergency Preparedness and Recovery programs are allocated on a 75%–25% basis between overhead and underground assets. These programs primarily support PSPS decision-making, which is largely driven by overhead infrastructure exposed to high wind conditions during extreme fire weather events, not underground infrastructure. A 25% allocation to underground assets is maintained to reflect residual dependencies, such as the need to preserve a comprehensive and reliable weather station network across the service territory, and to account for PSPS events that may still be triggered by upstream overhead assets.

To further demonstrate the logic, data, and reason underlying SDG&E's foundational cost allocation methodology, consider a hypothetical scenario: a new development involving 3,000 miles of undergrounding constructed entirely within the highest-risk areas of SDG&E's HFTD. It is reasonable to conclude, and likely universally accepted, that such a development would not require additional aviation firefighting resources, a dense network of new weather stations, or expanded PSPS operations. This is due to the inherently low wildfire ignition risk associated with underground infrastructure, particularly from SDG&E's electrical assets.

This example reinforces the principle that SDG&E's cost allocations are not arbitrary. They are based on a rational, evidence-based assessment of which operational activities and associated costs would persist under different mitigation strategies.

SDG&E encourages all parties to rely on data-supported approaches that are grounded in historical data, operational decision-making, and sound engineering principles. Conversely, SDG&E cautions that approaches which are lacking documented justification, analytical foundation, or supporting data not only have the potential to distort the focus away from the most critical risk factors, but also compromise the quality of risk assessments and erode the credibility of the resulting decisions, ultimately hindering effective risk mitigation and resource allocation.

The following tables present SDG&E's current long-term foundational cost allocations for CCC and SUG, alongside the alternative allocations proposed by MGRA. Additionally, the scatter plots below illustrate the overall impact on Cost-Benefit Ratios under different assumptions for WACC and societal discount rates, assuming no risk aversion. These results can be replicated by adjusting the corresponding input in cell K8 on the mitigation-specific tabs of SDG&E's RAMP workpapers, which reflects the long-term Foundational ongoing costs.

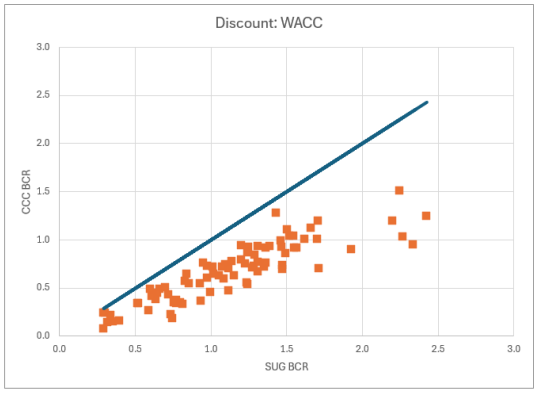
**SDG&E Response MGRA-1-8: Continued**

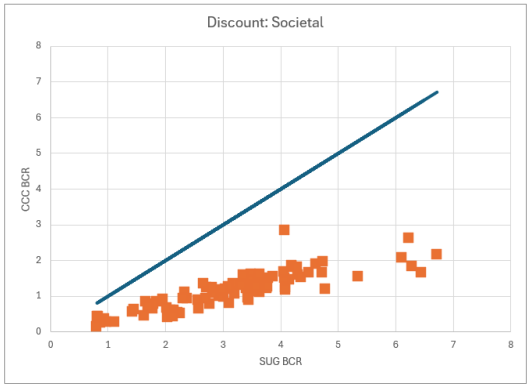
| | SDG&E Original | MGRA | |
|---|---|---|---|
| **Variable** | **CCC** | **CCC** | **Delta** |
| Foundational O&M Cost | $ 0.006438 | $ 0.005771 | 89.6% |
| Foundational Capital Cost | $ 0.001591 | $ 0.001381 | 86.8% |
| Total | $ 0.008030 | $ 0.007152 | 89.1% |

| | SDG&E Original | MGRA | |
|---|---|---|---|
| **Variable** | **SUG** | **SUG** | **Delta** |
| Foundational O&M Cost | $ 0.002270 | $ 0.002937 | 129.4% |
| Foundational Capital Cost | $ 0.001067 | $ 0.001277 | 119.7% |
| Total | $ 0.003337 | $ 0.004215 | 126.3% |

**Scatter Plots:**

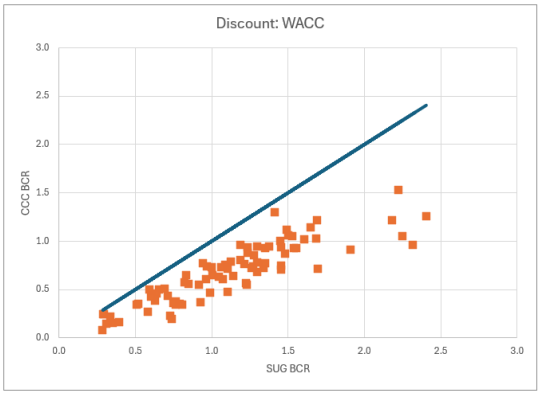
**SDG&E Original Foundational Cost Allocation:**

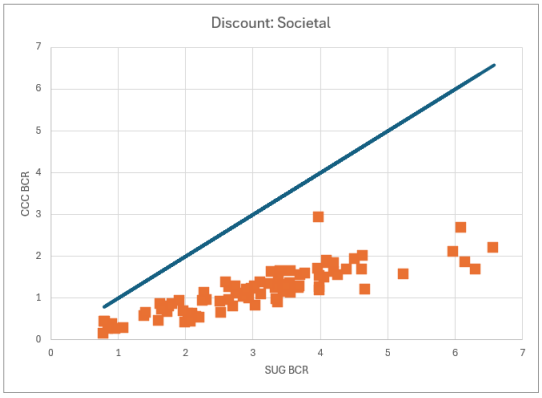


**SDG&E Response MGRA-1-8: Continued**

**MGRA's Foundational Cost Allocation:**




The overall effect of MGRA's proposed reallocation of foundational costs can be measured by evaluating the impact of the change in the average and standard deviation on the cost-benefit ratios:

| | SDG&E SUG | MGRA SUG | SDG&E CCC | MGRA CCC |
|---|---|---|---|---|
| WACC Discount Rate | 1.14 ± 0.49 | 1.13 ± 0.48 | 0.67 ± 0.30 | 0.68 ± 0.31 |
| Societal Discount Rate | 3.16 ± 1.35 | 3.09 ± 1.32 | 1.14 ± 0.54 | 1.16 ± 0.55 |

While minor changes are observed in the second decimal place of the cost-benefit ratios, the overall impact of MGRA's proposed reallocation of long-term foundational costs is minimal. The analysis continues to support the same conclusion: the cost-benefit ratio for Strategic Undergrounding remains higher than that for Combined Covered Conductor, indicating greater cost-effectiveness for undergrounding mitigation.

**Data Request Number:** MGRA-SDGE-001

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MGRA-1-9 Please provide a version of the CBR Main Workbook with No Aversion with the following modified assumptions for the CCC program tabs and SUG tabs, including 8. SUG_vs_CCC, C518_SUG, C550_CCC, CCC/SUG_RA_RAMP_2025_2027, Alt1, and Alt2 tabs. Also provide BCR plots.

a. CCC risk reduction efficiency of 80%

b. SUG cost of $2.5 million per mile

c. CCC cost of $1.2 million per mile

d. Equal long term cost allocation between SUG and CCC for aviation firefighting, weather station maintenance, and emergency preparedness programs.

**SDG&E Response MGRA-1-9:**

SDG&E objects to this request to the extent that it would impose an undue burden on SDG&E by requiring it to perform studies, analyses or calculations or to create documents that do not currently exist. SDG&E further objects to this request to the extent it seeks information or documents that are not reasonably calculated to lead to the discovery of admissible evidence. SDG&E further objects to this request on the grounds that it misstates facts and/or assumes facts that do not exist. Specifically, this request is based on inaccurate and unsupported representations of the risk reduction efficiency of CCC, cost per mile of SUG and CCC, and appropriate long term cost allocations between SUG and CCC. Subject to and without waiving the foregoing objections, SDG&E responds as follows:

Please see the attached file "MGRA-SDGE-001_Attach_Q1-9", where SDG&E has conducted the sensitivity analysis as requested by MGRA; however, it notes several critical concerns:

- The foundational cost allocation proposed by MGRA lacks documented justification, a clear analytical basis, and supporting data. See SDG&E's response to Question 8 in this data request.

- The cost estimates for Strategic Undergrounding (SUG) and Combined Covered Conductor (CCC) proposed by MGRA do not account for the full scope of SDG&E's mitigation portfolio, which encompasses approximately 800 miles. This broader scale is expected to yield economies of scale and substantial cost efficiencies that are not reflected in MGRA's assumptions.

**SDG&E Response MGRA-1-9: Continued**

- The CCC mitigation effectiveness rate of 80% assumed by MGRA is unsupported and appears arbitrary when applied to SDG&E's service territory. This assumption diverges from SDG&E's own assessments, which are based on actual Evidence of Heat records (61.71%) and CPUC-reportable ignition data (70.11%). Additionally, MGRA's assumption of 80% contradicts its own analysis referenced in the Informal 2025 SDG&E RAMP Comments, where mitigation effectiveness in SCE's service territory, where more than 6,000 miles of covered conductor have been installed, was revised downward from 81% to 74.4% due to increased ignition events in 2024. While MGRA acknowledges potential inconsistencies in SCE's data, it is important to note that 2024, marked by dry conditions and extreme weather across Southern California, reflects a mitigation effectiveness of only 60%.

**Data Request Number:** MGRA-SDGE-002

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**Date Received:** 09/19/25

**Date Responded: 10/03/25**

## GENERAL OBJECTIONS

1. SDG&E objects generally to each request to the extent that it seeks information protected by the attorney-client privilege, the attorney work product doctrine, or any other applicable privilege or evidentiary doctrine. No information protected by such privileges will be knowingly disclosed.

2. SDG&E objects generally to each request that is overly broad and unduly burdensome. As part of this objection, SDG&E objects to discovery requests that seek "all documents" or "each and every document" and similarly worded requests on the grounds that such requests are unreasonably cumulative and duplicative, fail to identify with specificity the information or material sought, and create an unreasonable burden compared to the likelihood of such requests leading to the discovery of admissible evidence. Notwithstanding this objection, SDG&E will produce all relevant, non-privileged information not otherwise objected to that it is able to locate after reasonable inquiry.

3. SDG&E objects generally to each request to the extent that the request is vague, unintelligible, or fails to identify with sufficient particularity the information or documents requested and, thus, is not susceptible to response at this time.

4. SDG&E objects generally to each request that: (1) asks for a legal conclusion to be drawn or legal research to be conducted on the grounds that such requests are not designed to elicit facts and, thus, violate the principles underlying discovery; (2) requires SDG&E to do legal research or perform additional analyses to respond to the request; or (3) seeks access to counsel's legal research, analyses or theories.

5. SDG&E objects generally to each request to the extent it seeks information or documents that are not reasonably calculated to lead to the discovery of admissible evidence.

6. SDG&E objects generally to each request to the extent that it is unreasonably duplicative or cumulative of other requests.

7. SDG&E objects generally to each request to the extent that it would require SDG&E to search its files for matters of public record such as filings, testimony, transcripts, decisions, orders, reports or other information, whether available in the public domain or through FERC or CPUC sources.

8. SDG&E objects generally to each request to the extent that it seeks information or documents that are not in the possession, custody or control of SDG&E.

9. SDG&E objects generally to each request to the extent that the request would impose an undue burden on SDG&E by requiring it to perform studies, analyses or calculations or to create documents that do not currently exist.

10. SDG&E objects generally to each request that calls for information that contains trade secrets, is privileged or otherwise entitled to confidential protection by reference to statutory protection. SDG&E objects to providing such information absent an appropriate protective order.

## II. EXPRESS RESERVATIONS

1. No response, objection, limitation or lack thereof, set forth in these responses and objections shall be deemed an admission or representation by SDG&E as to the existence or nonexistence of the requested information or that any such information is relevant or admissible.

2. SDG&E reserves the right to modify or supplement its responses and objections to each request, and the provision of any information pursuant to any request is not a waiver of that right.

3. SDG&E reserves the right to rely, at any time, upon subsequently discovered information.

4. These responses are made solely for the purpose of this proceeding and for no other purpose.

**Data Request Number:** MGRA-SDGE-002

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Regarding the files provided to SPD in response to SPD-RAMP-012, specifically the Excel files:

SPD-RAMP-012_Attach_Q3_CBR_Main_Workbook_NoAversion_19385

SPD-RAMP-012_Attach_Q1b_Comparison_Summary_2025_08_07_19385

SPD-RAMP-012_Attach_Q3_ Calc_Details_NoAversion_19385

SPD-RAMP-012_Attach_Q3_CBR_Main_Workbook_Aversion_19385

SPD-RAMP-012_Attach_Q3_Calc_Details_Aversion_19385

Please provide versions of these files, updated with any more current revisions but with active cells using formulae, as provided in the WMP and in SDG&E's response to MGRA Data Request 1. In the version provided to SPD the cell values were "value only" and had all formulae removed.

**SDG&E Response MGRA-2-1:**

The following attached files have been updated with the latest Mitigation Effectiveness (ME) as presented in WMP R1:

- MGRA-SDGE-02_Attach_Q1_Calc_Details_Aversion
- MGRA-SDGE-02_Attach_Q1_Calc_Details_NoAversion

The following attached file has not been updated as its purpose was to compare the May 15 RAMP submission to the SPD-RAMP-012 files. Updating it would defeat the purpose of its creation. The file has been supplied with formulas as requested:

- MGRA-SDGE-02_Attach_Q1_Comparison_Summary_2025_08_07

**Data Request Number:** MGRA-SDGE-002

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Regarding SDG&E's response to MGRA-1-4 and MGRA-1-5:

a. Please provide technical details and documentation of the Probability of Failure model for Conductor and Vegetation.

**SDG&E Response MGRA-2-2.a:**

Please refer to the Excel file titled MGRA-SDGE-002_Attach_Q2a for detailed documentation of the Probability of Failure model related to conductor and vegetation risk.

Regarding SDG&E's response to MGRA-1-4 and MGRA-1-5:

b. For Pole/Span Conditional Probability of Ignition, does this model incorporate or is it used with a Probability of Failure? If so, please provide the Probability of Failure model. If it does not incorporate a probability of failure, explain why not.

**SDG&E Response MGRA-2-2.b:**

SDG&E's Pole/Span Conditional Probability of Ignition model does not incorporate a Probability of Failure (PoF) model. Instead, it is designed to estimate the likelihood of ignition given that an asset failure has already occurred, under specific weather conditions and fuel types. This approach focuses on the conditional risk of ignition rather than the probability of the initiating failure itself.

While SDG&E does maintain separate PoF models for various failure types, including conductor, vegetation, vehicle, other equipment, and foreign object, these models are not integrated into the Conditional Probability of Ignition model. The rationale for this separation is to allow for modular risk modeling, where PoF and conditional ignition probability can be independently assessed and combined as needed in broader risk frameworks (e.g., in WiNGS-Planning or WiNGS-Ops calculations).

For every pole/span and hour, whether historical or forecasted, within SDG&E's service territory, the final Probability of Ignition (PoI) is calculated as the product of the Conditional Probability of Ignition and the Probability of Failure:

$$PoI(t) = Conditional\_PoI\ (t) * PoF\ (t)$$

Where:

- PoI(t): The final Probability of Ignition at time *t*, representing the likelihood that an ignition will occur at a specific pole/span location during a given hour.

- PoF(t): The Probability of Failure at time *t*, which represents the likelihood that an asset (e.g., conductor, vegetation, equipment) will fail during that hour. This is modeled separately and varies by failure mode, asset type, and environmental conditions.

- Conditional_PoI(t): The Conditional Probability of Ignition at time *t*, which estimates the probability of ignition given that a failure has occurred, based on environmental conditions and asset characteristics. This calculation is performed over Uber H3 hexagon surface areas at resolution 11, which feature an approximate edge length of 28.6 meters. This fine spatial granularity enables

**SDG&E Response MGRA-2-2.b: CONTINUED**

- detailed risk assessment while significantly optimizing computational efficiency through faster processing and reduced resource demands.

Conditional_PoI(t) ≈ $\oint$(Outage_to_Ignition_Ratio, Burnable_True/False, Ignition_Component(t))

The probability in the Conditional Probability of Ignition model is derived from a combination of factors:

- Outage-to-Ignition Ratio: a time-independent, historical metric that quantifies the relationship between outages and actual ignitions. It is derived from 2019-2023 outage and ignition data across 25 distinct fuel layers, and calculated specifically under elevated Fire Potential Index (FPI) conditions to reflect high-risk scenarios.
- Burnable (True/False) is a binary indicator used to determine whether the area surrounding a pole/span contains burnable fuel. This classification is manually assigned by SDG&E subject matter experts from the Meteorology and Fire Coordination teams, based on vegetation characteristics and fuel conditions relevant to ignition risk modeling. For example, areas such as water bodies (gridcode 989) or roads surrounded by non-burnable fuels (gridcode 949) are classified as False, while vegetation types like shrubs (gridcode 122) or grass mixed with shrubs exhibiting high flame lengths and spread rates (gridcode 145) are classified as True.
- Ignition_Component(t): The Ignition Component (IC) is a rating within the US Forest Service's National Fire Danger Rating System (NFDRS) that estimates the probability of a firebrand causing a fire that requires suppression. Expressed as a probability, it ranges on a scale of zero to 100. An IC of 100 means that every firebrand will cause an actionable fire if it contacts a receptive fuel. Conversely, an IC of zero would mean that no firebrand would cause an actionable fire under those conditions.

  This is a time-dependent variable, accounting for dynamic environmental factors such as temperature, humidity, and fuel moisture, which influence ignition potential throughout the day. The IC values used in SDG&E's modeling are derived from the GFS 004 weather model, which is downloaded from the San Diego Supercomputer Center (SDSC) at https://sdge.sdsc.edu/data/sdge/historical-ens_gfs_004/dfm/ . Forecasts can be visualized at the following website: https://wxmap.sdsc.edu//.

Regarding SDG&E's response to MGRA-1-4 and MGRA-1-5:

c. For Conductor, Vegetation, and Pole/Span Probability of Failure models, please show a normalized graph of probability of failure versus wind gust speed, provide corresponding data and description of calculation.

**SDG&E Response MGRA-2-2.c:**

**Conductor model**

The SDG&E Conductor model is a statistical log-log regression model developed to estimate the conductor failure rate under varying environmental conditions. Specifically, it captures the relationship between wind gust intensity, wind direction, and conductor-specific attributes at the wire span level.

The model uses a log-log regression approach, where the logarithm of the probability of failure is expressed as a linear combination of the logarithms of key predictors. Including:

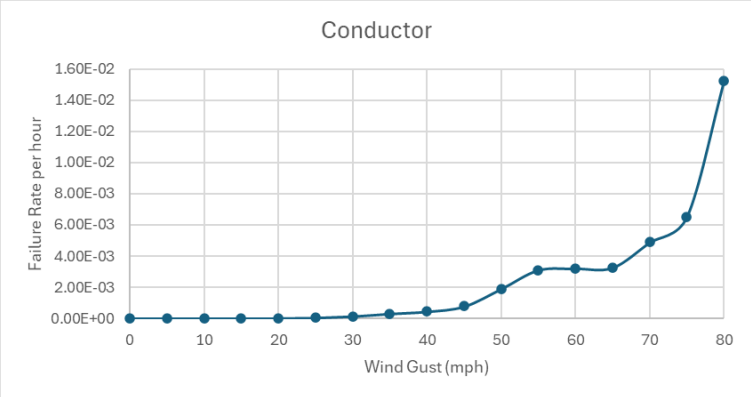
- Wind gust
- Wind direction
- Span length
- Conductor size, type, and material
- Conductor angle relative to the wind direction
- District (location)
- Lateral IDC indicator (yes/no)

The model calculates the probability of conductor failure at the wire span level, represented as a rate per mile per hour of wind gust. This level of granularity supports detailed conductor risk assessment throughout SDG&E's service territory by incorporating both environmental conditions and conductor-specific characteristics.

Although wind gust is the most influential predictor, it is only one of several variables used in a multivariate log-log regression framework. Note that interpreting model performance or results based solely on wind gust oversimplifies the model's overall purpose and structure.

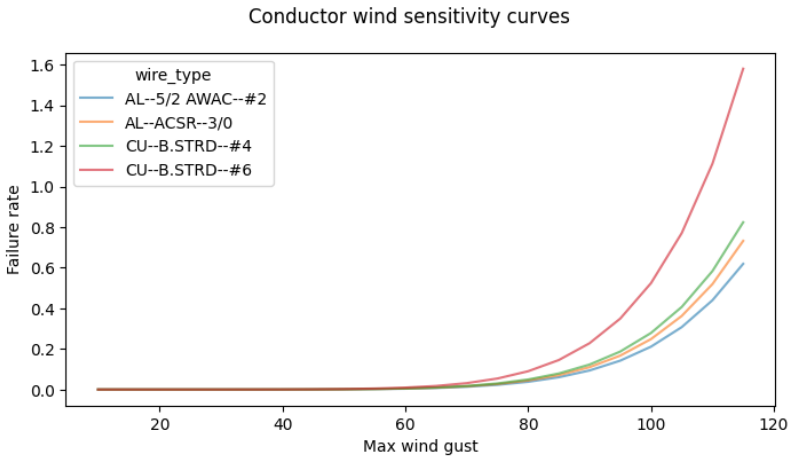
The table and graph below present a normalized failure rate per mile-year as a function of wind gust speed across SDG&E's HFTD, along with the corresponding expected annual failures for the period from August 2024 to July 2025.

| # | Wind Gust (mph) | feeder-segment hours in SDG&E's territory | Average failure rate per hour | Expected Annual Failures |
|---|---|---|---|---|
| 1 | 0 | 1,155,603 | 1.66E-07 | 0.19 |
| 2 | 5 | 1,492,996 | 8.07E-07 | 1.20 |
| 3 | 10 | 756,735 | 3.47E-06 | 2.63 |
| 4 | 15 | 544,364 | 7.53E-06 | 4.10 |
| 5 | 20 | 389,541 | 1.47E-05 | 5.73 |
| 6 | 25 | 136,343 | 4.63E-05 | 6.32 |
| 7 | 30 | 55,226 | 1.39E-04 | 7.69 |
| 8 | 35 | 29,460 | 3.07E-04 | 9.04 |
| 9 | 40 | 17,472 | 4.41E-04 | 7.71 |
| 10 | 45 | 10,030 | 7.69E-04 | 7.71 |
| 11 | 50 | 5,008 | 1.88E-03 | 9.43 |
| 12 | 55 | 2,422 | 3.08E-03 | 7.45 |
| 13 | 60 | 1,202 | 3.17E-03 | 3.81 |
| 14 | 65 | 547 | 3.23E-03 | 1.77 |
| 15 | 70 | 243 | 4.83E-03 | 1.17 |
| 16 | 75 | 92 | 6.45E-03 | 0.59 |
| 17 | 80 | 47 | 1.51E-02 | 0.71 |
| Total | | 4,597,284 | --- | 77.25 |




The conductor model estimates how failure rates vary based on conductor size, type, and material. The graph below illustrates failure rate versus wind gust speed for four

representative conductor types in the Mountain Empire district, under the worst-case scenario where wind blows perpendicular to the span direction.



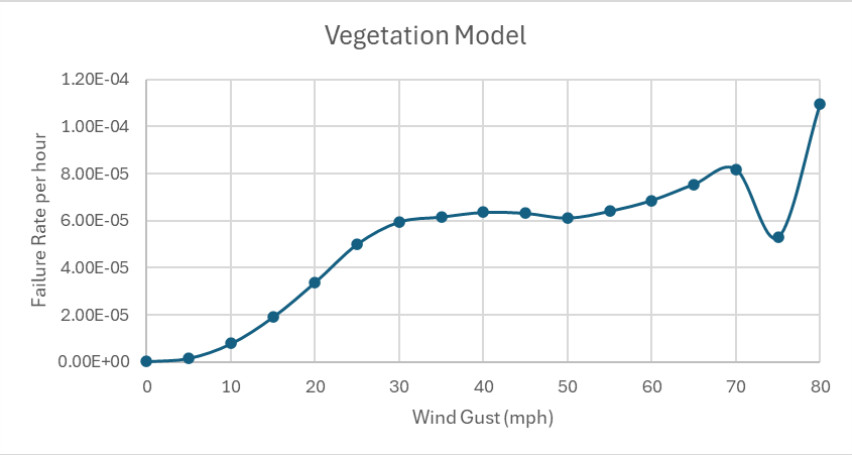

## Vegetation model

Similar to the Conductor model, the Vegetation model is a statistical log-log regression designed to estimate vegetation-related failure rates under varying weather conditions. It captures the relationship between wind gust speed, wind direction, geographic location, and the number and types of trees surrounding electrical spans.

The table and graph below present a normalized failure rate per mile-year as a function of wind gust speed across SDG&E's HFTD, along with the corresponding expected annual failures for the period from August 2024 to July 2025.

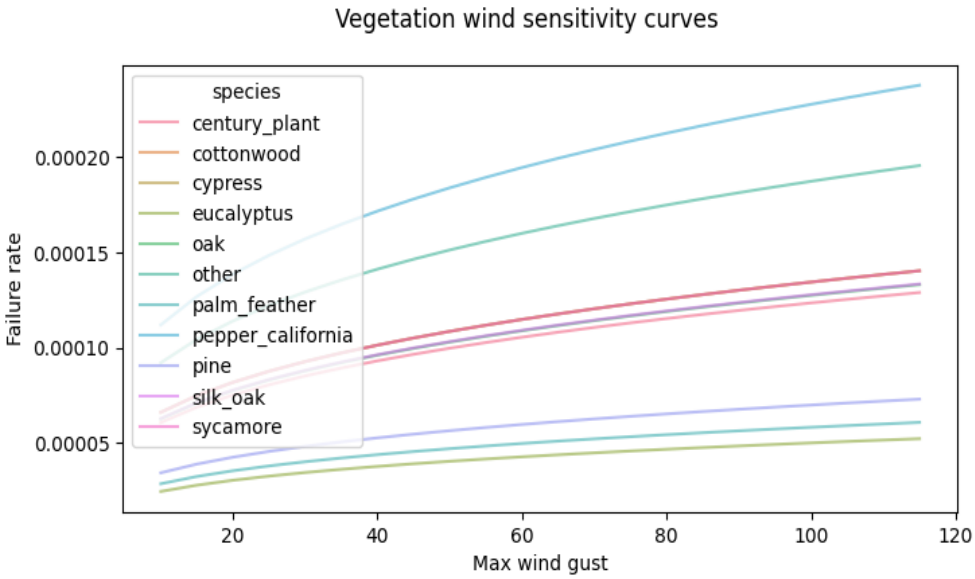
| # | Wind Gust (mph) | feeder-segment hours in SDG&E's territory | Average failure rate per hour | Expected Annual Failures |
|---|---|---|---|---|
| 1 | 0 | 1,155,603 | 3.37E-07 | 0.39 |
| 2 | 5 | 1,492,996 | 1.73E-06 | 2.59 |
| 3 | 10 | 756,735 | 7.91E-06 | 5.98 |
| 4 | 15 | 544,364 | 1.91E-05 | 10.42 |
| 5 | 20 | 389,541 | 3.38E-05 | 13.18 |
| 6 | 25 | 136,343 | 5.00E-05 | 6.82 |
| 7 | 30 | 55,226 | 5.95E-05 | 3.28 |

| | | | | |
|---|---|---|---|---|
| 8 | 35 | 29,460 | 6.16E-05 | 1.81 |
| 9 | 40 | 17,472 | 6.35E-05 | 1.11 |
| 10 | 45 | 10,030 | 6.32E-05 | 0.63 |
| 11 | 50 | 5,008 | 6.12E-05 | 0.31 |
| 12 | 55 | 2,422 | 6.40E-05 | 0.16 |
| 13 | 60 | 1,202 | 6.86E-05 | 0.08 |
| 14 | 65 | 547 | 7.54E-05 | 0.04 |
| 15 | 70 | 243 | 8.18E-05 | 0.02 |
| 16 | 75 | 92 | 5.30E-05 | 0.00 |
| 17 | 80 | 47 | 1.10E-04 | 0.01 |
| Total | | 4,597,284 | --- | 46.83 |




Note that the small 'dip' observed in the 70 to 80 mph range is due to localized variability in the model inputs, such as a lower density of exposed assets or vegetation in areas experiencing those wind speeds, which reduces the calculated average failure rate before it increases again at higher wind speeds.

The Vegetation model estimates how failure rates vary based on different tree species. The graph below illustrates failure rate versus wind gust speed for a few representative tree species.



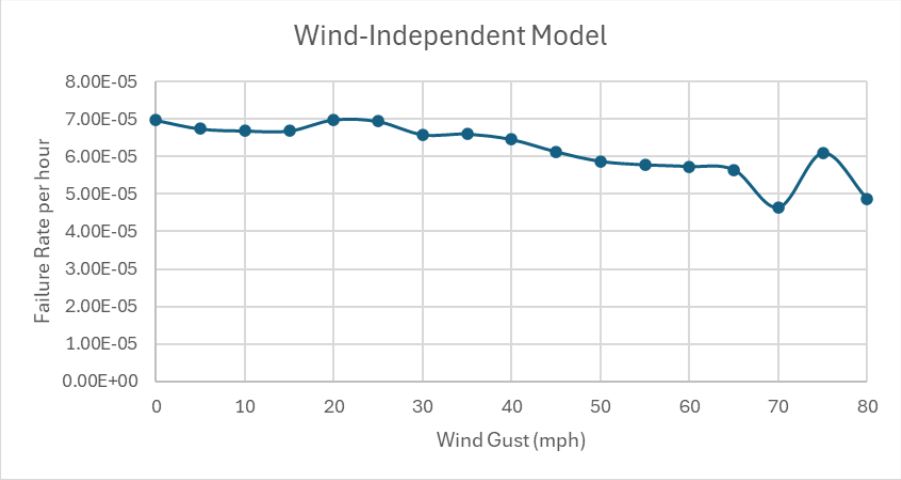

**"Wind-Independent" pole/span model**

The "wind-independent" failure rates represent hourly failure rates for various failure modes, including asset-related failures not associated with wind events, as well as external factors such as animal and vehicle contacts that could potentially lead to ignitions. The table below presents results from models that are not influenced by wind gust speed and therefore do not exhibit significant variation in failure rates across different wind conditions. Minor differences in failure rates result from other model variables, like the number of assets located near roadways or the presence of poles with distribution transformers that slightly influence the hourly failure rate in these models.

The table and graph below present a normalized failure rate per mile-year as a function of wind gust speed across SDG&E's HFTD, along with the corresponding expected annual failures for the period from August 2024 to July 2025.

| # | Wind Gust (mph) | feeder-segment hours in SDG&E's territory | Average failure rate per hour | Expected Annual Failures |
|---|---|---|---|---|
| 1 | 0 | 1,155,603 | 6.98E-05 | 80.66 |
| 2 | 5 | 1,493,120 | 6.75E-05 | 100.73 |
| 3 | 10 | 756,587 | 6.69E-05 | 50.63 |
| 4 | 15 | 544,423 | 6.69E-05 | 36.44 |
| 5 | 20 | 389,554 | 6.99E-05 | 27.25 |
| 6 | 25 | 136,304 | 6.95E-05 | 9.47 |

| | | | | |
|---|---|---|---|---|
| 7 | 30 | 55,212 | 6.59E-05 | 3.64 |
| 8 | 35 | 29,460 | 6.61E-05 | 1.95 |
| 9 | 40 | 17,472 | 6.46E-05 | 1.13 |
| 10 | 45 | 10,030 | 6.13E-05 | 0.62 |
| 11 | 50 | 5,008 | 5.88E-05 | 0.29 |
| 12 | 55 | 2,422 | 5.78E-05 | 0.14 |
| 13 | 60 | 1,202 | 5.74E-05 | 0.07 |
| 14 | 65 | 547 | 5.65E-05 | 0.03 |
| 15 | 70 | 243 | 4.63E-05 | 0.01 |
| 16 | 75 | 92 | 6.10E-05 | 0.01 |
| 17 | 80 | 47 | 4.86E-05 | 0.00 |
| Total | | 4,597,279 | --- | 313.06 |



**Data Request Number:** MGRA-SDGE-002

**Proceeding Name:** 2025 Risk Assessment & Mitigation Phase (RAMP)(TY 2028)

**Publish To:** Mussey Grade Road Alliance

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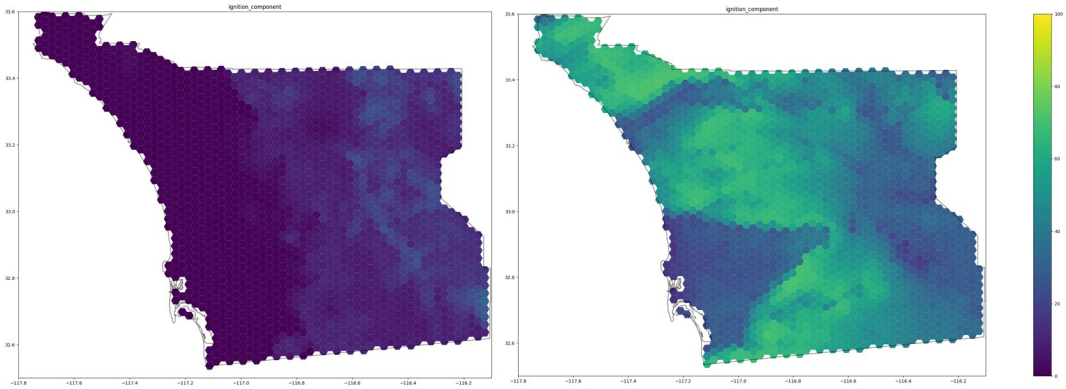
**Date Responded: 10/03/25**

Regarding SDG&E's response to MGRA-1-4 and MGRA-1-5:

d. For the POI ignition rates calculated from analysis of the 2020 and 2024 historical periods, show a normalized graph of the conditional POI versus wind gust speed, provide corresponding data and description of calculation.

**SDG&E Response MGRA-2-2.d:**

As outlined in the response to MGRA-2-2 b), SDG&E's Conditional Probability of Ignition (POI) is determined by several environmental and geographic factors, including location-specific fuel types, relative humidity, and temperature. During Santa Ana weather events, which are marked by strong, dry offshore winds, there is a well-established correlation between elevated wind gusts and low relative humidity. These conditions significantly heighten ignition risk due to the rapid drying of vegetation and increased potential for fire spread. The Conditional POI model incorporates this relationship through the Ignition Component variable:




The figures above show Ignition Component (IC) values and their spatial and temporal variability across SDG&E's service territory during the Santa Ana weather event in December 2024. The figure on the left displays IC values on December 9, 2024 at 8:00 AM, while the figure on the right shows IC values on December 10, 2024 at 3:00 PM.

To maintain consistency with the response provided in MGRA-2-2 c), a normalized Conditional Probability of Ignition versus wind gust speed across SDG&E's HFTD is presented for the period spanning August 2024 through July 2025.

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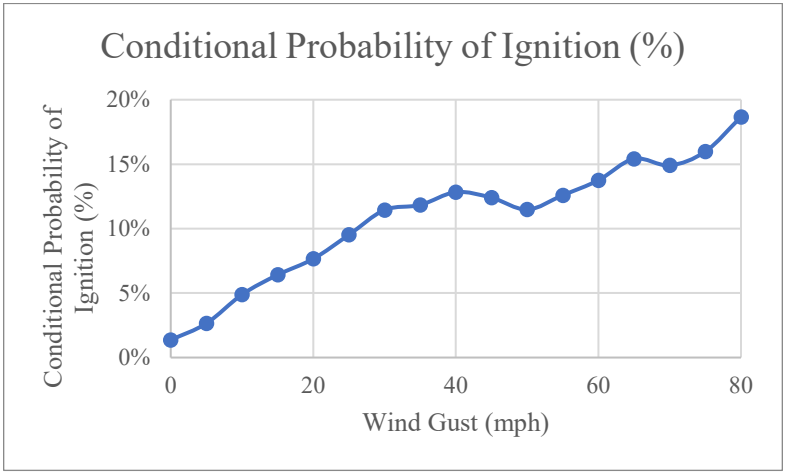
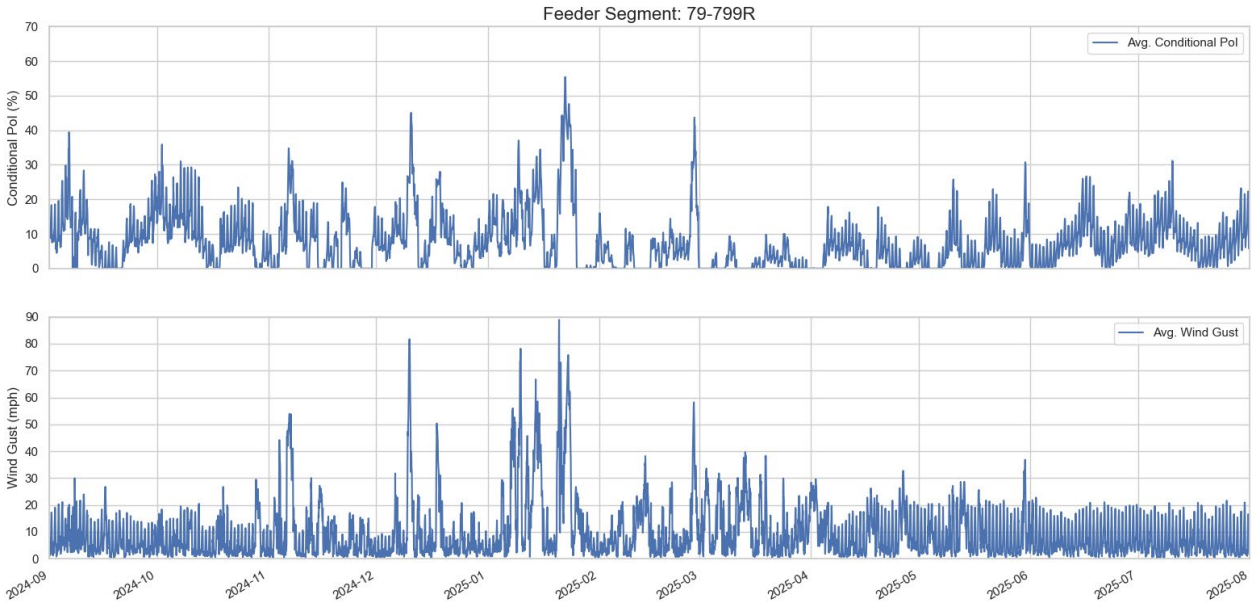
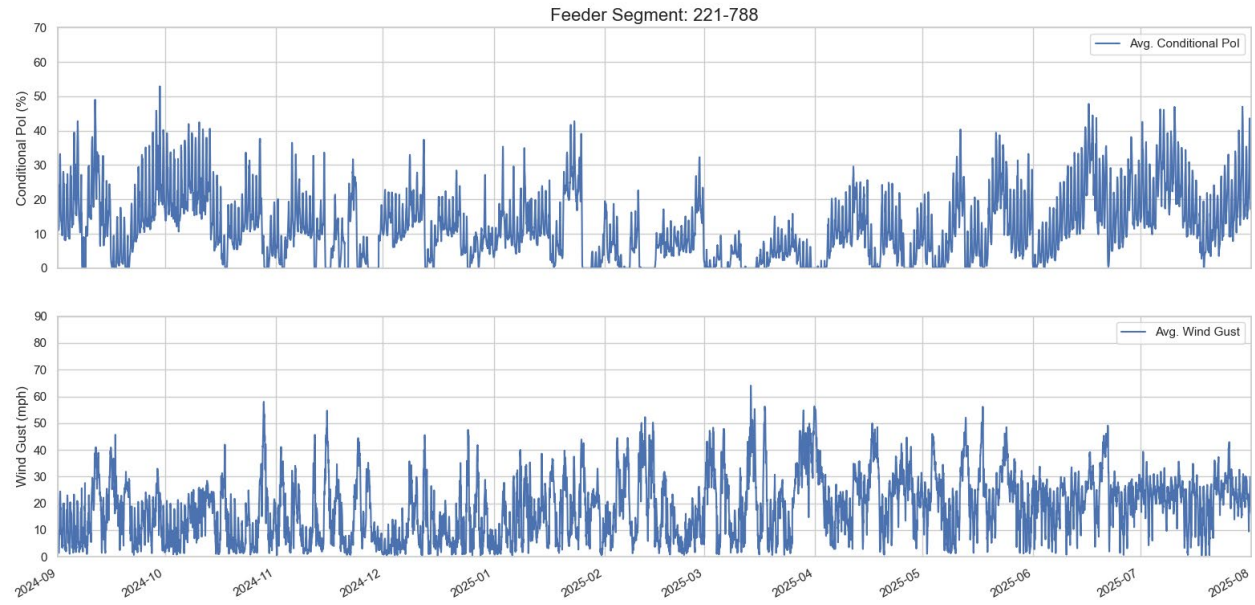
| # | Wind Gust (mph) | feeder-segment hours in SDG&E's territory | Conditional PoI (%) |
|---|---|---|---|
| 1 | 0 | 1,155,603 | 1% |
| 2 | 5 | 1,492,996 | 3% |
| 3 | 10 | 756,735 | 5% |
| 4 | 15 | 544,364 | 6% |
| 5 | 20 | 389,541 | 8% |
| 6 | 25 | 136,343 | 10% |
| 7 | 30 | 55,226 | 11% |
| 8 | 35 | 29,460 | 12% |
| 9 | 40 | 17,472 | 13% |
| 10 | 45 | 10,030 | 12% |
| 11 | 50 | 5,008 | 11% |
| 12 | 55 | 2,422 | 13% |
| 13 | 60 | 1,202 | 14% |
| 14 | 65 | 547 | 15% |
| 15 | 70 | 243 | 15% |
| 16 | 75 | 92 | 16% |
| 17 | 80 | 47 | 19% |
| Total | | 4,597,284 | --- |



The time series plots below illustrate wind gusts and average Conditional POI for two feeder segments: 79-799R, which typically experiences strong winds during Santa Ana events, and 221-782R, where wind activity is generally less pronounced.




Regarding SDG&E's response to SPD-Sempra-2025RAMP-013: SDG&E lists certain circuit segments (214-1135R) as having high PSPS risk due to high wind gust speeds.

Additionally, SDG&E discusses 'bundling' the hardening of upstream feeder segments to optimize PSPS risk reduction and leverage economies of scale". For all circuit segments that SDG&E has identified as candidates for undergrounding:

a. For each proposed "bundle", list the circuit segment and all upstream circuit segments.

**SDG&E Response MGRA-2-3.a:**

Please see attached file MGRA-SDGE-002_Attach_Q3a for segments identified for undergrounding in the RAMP 2028-2031 cycle, as detailed in the RAMP Wildfire & PSPS workpapers. See notes below pertaining to the file.

Notes:

- The field *potential_bundling_option* is a flag that specifies segments whereby bundling consideration is explored, due to upstream/downstream connectivity between planned underground segments sharing the same feeder

- Final bundling decisions are made during the detailed scoping phase of each project, not during the earlier risk modeling phase. While the risk modeling phase helps identify potential design routes, construction scope, and estimated risk reduction benefits, it does not determine how segments will ultimately be grouped or bundled for implementation. Bundling is finalized later based on a range of practical considerations, including engineering feasibility, field conditions, permitting constraints, resource availability, and construction sequencing. These factors are assessed in later phases to ensure efficient execution and alignment with operational realities.

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Regarding SDG&E's response to SPD-Sempra-2025RAMP-013: SDG&E lists certain circuit segments (214-1135R) as having high PSPS risk due to high wind gust speeds. Additionally, SDG&E discusses 'bundling' the hardening of upstream feeder segments to optimize PSPS risk reduction and leverage economies of scale". For all circuit segments that SDG&E has identified as candidates for undergrounding:

b. For all circuit segments planned for undergrounding during this GRC period based on PSPS considerations – high wind speed, bundling, or economies of scale – provide the following data in an Excel spreadsheet:

a) Circuit segment

b) Proposed circuit miles of undergrounding to be performed

c) Maximum measured wind speed associated with the circuit used in the assessment

d) Number of commercial customers on the circuit segment

e) Number of residential customers on the circuit segment

f) Projected number of minutes of PSPS outage per year, based on historical backcasting and used in the calculation of "PSPS Risk" for that circuit segment.

**SDG&E Response MGRA-2-3.b:**

Please see response to MGRA-2-3a for the associated file.

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For circuits identified in Table 1 of SPD-Sempra-2025RAMP-013 not showing BCR calculations (Upstream 909-451, 524-69R, and 157-81R), please provide WACC BCRs for SUG and CCC assuming a 2031 start date

**SDG&E Response MGRA-2-4:**

Based on the same files used to calculate the Benefit-Cost Ratios (BCRs) in Table 1 of SPD-Sempra-2025RAMP-013, the WACC-adjusted BCRs for the feeder segments in question, assuming a 2031 start date, are provided below, both with Risk Aversion (RA) and without Risk Aversion (NoRA)

| Feeder Segment | SUG BCR NoRA | SUG BCR RA | CCC BCR NoRA | CCC BCR RA |
|---|---|---|---|---|
| 909-451 | 1.66 | 19.47 | 1.02 | 11.93 |
| 524-69R | 1.08 | 9.52 | 0.73 | 6.45 |
| 157-81R | 0.74 | 4.87 | 0.40 | 2.60 |

Using the attached updated RAMP workbooks provided in response to Q1, the calculated BCRs are:

| Feeder Segment | SUG BCR NoRA | SUG BCR RA | CCC BCR NoRA | CCC BCR RA |
|---|---|---|---|---|
| 909-451 | 1.71 | 20.05 | 1.33 | 15.67 |
| 524-69R | 1.00 | 8.82 | 0.87 | 7.71 |
| 157-81R | 0.76 | 5.01 | 0.51 | 3.40 |

Note: SDG&E's Excel workbooks are designed to be user-friendly, allowing users to easily evaluate any feeder segment within the service territory. To test additional feeder segments, simply open the attached RAMP workbooks and navigate to the 'SUG' or 'CCC' tab. Enter the feeder segment of interest at the bottom of column D and specify the mitigation year in column A. Then, drag the formulas down to populate the relevant calculations. For reference, segments 909-451, 524-69R, and 157-81R have already been included in the respective tabs as examples.

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Regarding SDG&E's response CalAdvocates-RAMP-Informal-001_Attach_19408, does the long term O&M cost for PSPS include the effect of a higher PSPS threshold enabled by covered conductor, or is it based solely on backcasting of historical data?

**SDG&E Response MGRA-2-5:**

Yes, it does. The estimated PSPS events per year on a given segment are derived from Monte Carlo Simulation based on the worst days of wildfire conditions from 2012 to 2022.

Wind speeds measured at each segment's weather station are evaluated against the segment's alert speed threshold, which depends on the conductor's hardening state. For covered conductor segments or when covered conductor is applied, the alert speed threshold is higher than unhardened segments. This higher wind alert speed is used to estimate the PSPS frequency per year when covered conductor is considered, resulting in fewer simulated PSPS events.

**Data Request Number:** MGRA-SDGE-003

**Proceeding Name:** 2025 Risk Assessment & Mitigation Phase (RAMP)(TY 2028)

**Publish To:** Mussey Grade Road Alliance

**Date Received:** 10/27/25

**Date Responded: 11/07/25**

## GENERAL OBJECTIONS

1. SDG&E objects generally to each request to the extent that it seeks information protected by the attorney-client privilege, the attorney work product doctrine, or any other applicable privilege or evidentiary doctrine. No information protected by such privileges will be knowingly disclosed.

2. SDG&E objects generally to each request that is overly broad and unduly burdensome. As part of this objection, SDG&E objects to discovery requests that seek "all documents" or "each and every document" and similarly worded requests on the grounds that such requests are unreasonably cumulative and duplicative, fail to identify with specificity the information or material sought, and create an unreasonable burden compared to the likelihood of such requests leading to the discovery of admissible evidence. Notwithstanding this objection, SDG&E will produce all relevant, non-privileged information not otherwise objected to that it is able to locate after reasonable inquiry.

3. SDG&E objects generally to each request to the extent that the request is vague, unintelligible, or fails to identify with sufficient particularity the information or documents requested and, thus, is not susceptible to response at this time.

4. SDG&E objects generally to each request that: (1) asks for a legal conclusion to be drawn or legal research to be conducted on the grounds that such requests are not designed to elicit facts and, thus, violate the principles underlying discovery; (2) requires SDG&E to do legal research or perform additional analyses to respond to the request; or (3) seeks access to counsel's legal research, analyses or theories.

5. SDG&E objects generally to each request to the extent it seeks information or documents that are not reasonably calculated to lead to the discovery of admissible evidence.

6. SDG&E objects generally to each request to the extent that it is unreasonably duplicative or cumulative of other requests.

7. SDG&E objects generally to each request to the extent that it would require SDG&E to search its files for matters of public record such as filings, testimony, transcripts, decisions, orders, reports or other information, whether available in the public domain or through FERC or CPUC sources.

8. SDG&E objects generally to each request to the extent that it seeks information or documents that are not in the possession, custody or control of SDG&E.

9. SDG&E objects generally to each request to the extent that the request would impose an undue burden on SDG&E by requiring it to perform studies, analyses or calculations or to create documents that do not currently exist.

10. SDG&E objects generally to each request that calls for information that contains trade secrets, is privileged or otherwise entitled to confidential protection by reference to statutory protection. SDG&E objects to providing such information absent an appropriate protective order.

## II. EXPRESS RESERVATIONS

1. No response, objection, limitation or lack thereof, set forth in these responses and objections shall be deemed an admission or representation by SDG&E as to the existence or nonexistence of the requested information or that any such information is relevant or admissible.

2. SDG&E reserves the right to modify or supplement its responses and objections to each request, and the provision of any information pursuant to any request is not a waiver of that right.

3. SDG&E reserves the right to rely, at any time, upon subsequently discovered information.

4. These responses are made solely for the purpose of this proceeding and for no other purpose.

**Data Request Number:** MGRA-SDGE-003

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MGRA-3-1 Regarding SDG&E's response to Data Request MGRA-2-2

a. For the "Conductor wind sensitivity curves" graph, if the plotted curves are based on a parametric fit to wind sensitivity for different wire types, provide the function and parameters for each wire type. Alternatively if the plotted curves are based on a spline or smoothing curve for data provide the max wind gust versus failure rate in a tabular form.

**SDG&E Response Q.3-1a:**

The conductor wind sensitivity curves presented in SDG&E's wildfire risk model are based on a log-log regression model, which captures the exponential relationship between maximum wind gust and failure rate for different conductor types.

The general form of the log-log regression equation used is:

$$ln(Y)=\beta 0+\beta 1\times ln(X)+\beta 2\times ln(X*\mathrm{X})$$

Where: $\beta 0$ is the constant and $\beta 1$ is the independent variable coefficients and $\beta 2$ represents the coefficient for independent variable interaction terms

| # | Feature | Coeff | Comments |
|---|---|---|---|
| 1 | const | -28.36 | constant |
| 2 | log_eq_perpend_wind_gust | 7.91 | Log-transformed value of the perpendicular wind gust observed at the span, calculated as:<br><br>log(Wind Gust×sin(θ))<br><br>where:<br>- Wind Gust is the maximum gust speed observed (in mph),<br>- θ is the angle between the wind direction and the orientation of the conductor span. |
| 3 | District_Beach Cities | -3.81 | Categorical variable representing SDG&E's service territory districts |
| 4 | District_Eastern | -3.32 | Categorical variable representing SDG&E's service territory districts |

| | | | |
|---|---|---|---|
| 5 | District_Metro | -3.66 | Categorical variable representing SDG&E's service territory districts |
| 6 | District_Mountain Empire | -5.55 | Categorical variable representing SDG&E's service territory districts |
| 7 | District_North Coast | -1.76 | Categorical variable representing SDG&E's service territory districts |
| 8 | District_Northeast | -2.54 | Categorical variable representing SDG&E's service territory districts |
| 9 | District_Orange County | -2.22 | Categorical variable representing SDG&E's service territory districts |
| 10 | District_Ramona | -5.50 | Categorical variable representing SDG&E's service territory districts |
| 11 | Z_LATERALIDC_YES | -1.03 | Dummy variable indicating if the span is part of the main feeder or belongs to a lateral segment |
| 12 | Z_MEASUREDLENGTH_buckets_(0, 100] | -4.51 | Categorical variable representing span length, measured in feet. |
| 13 | Z_MEASUREDLENGTH_buckets_(100, 200] | -6.00 | Categorical variable representing span length, measured in feet. |
| 14 | Z_MEASUREDLENGTH_buckets_(200, 300] | -5.77 | Categorical variable representing span length, measured in feet. |
| 15 | Z_MEASUREDLENGTH_buckets_(300, 500] | -6.32 | Categorical variable representing span length, measured in feet. |
| 16 | Z_MEASUREDLENGTH_buckets_(500, 1000] | -5.76 | Categorical variable representing span length, measured in feet. |
| 17 | log_W_wire_combination_AL--5/2 AWAC--#2 | -0.21 | Log-transformed value of the perpendicular wind gust observed at the span, calculated as: |
| 18 | log_W_wire_combination_CU--B.STRD--#4 | -0.15 | Interaction term between the log-transformed wind gust variable and conductor-specific attributes such as material, type, and size. |
| 19 | log_W_wire_combination_CU--B.STRD--#6 | -0.02 | Interaction term between the log-transformed wind gust variable |

| | | | |
|---|---|---|---|
| | | | and conductor-specific attributes such as material, type, and size. |
| 20 | log_W_wire_combination_AL--ACSR--3/0 | -0.18 | Interaction term between the log-transformed wind gust variable and conductor-specific attributes such as material, type, and size. |

The log-log regression model coefficients presented in this response are based on data available prior to 2025 and therefore do not include observations from the 2025 calendar year. As part of SDG&E's commitment to continuous improvement and data-driven modeling, the conductor failure probability model will be updated once the full set of 2025 data becomes available.

This update will be reflected in the model inputs and outputs included in the upcoming GRC filing, ensuring that the most current and comprehensive data informs risk quantification and mitigation planning.

**Data Request Number:** MGRA-SDGE-003

**Proceeding Name:** 2025 Risk Assessment & Mitigation Phase (RAMP)(TY 2028)

**Publish To:** Mussey Grade Road Alliance

**Date Received:** 10/27/25

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MGRA-3-1 Regarding SDG&E's response to Data Request MGRA-2-2

b. For the graph "Vegetation wind sensitivity curves",

a) Explain whether the graph is a total failure rate over SDG&E's territory, is a failure rate per mile, or is a failure rate per tree.

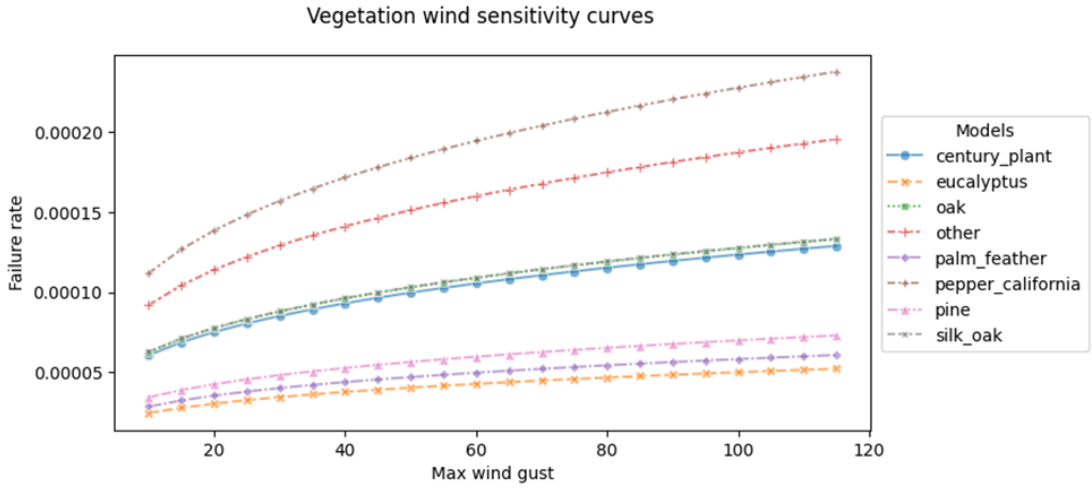
b) Please provide a re-plot of the graph using failure rate per tree, and using a line type in addition to color (solid, dashed, dotted, etc.) due to the fact that the color palette in the plot overlaps.

c) If the lines are a parametric fit to a curve, provide the function and parameters for each tree species. Alternatively if the plotted lines are based on a spline or smoothing curve provide the failure rate in tabular form.

**SDG&E Response Q.3-1b:**

a) SDG&E's current vegetation risk model estimates a failure rate per mile per year, which serves as the basis for quantifying vegetation-related risk across the system. Importantly, the model incorporates span-level vegetation characteristics by controlling for both the number and type of trees associated with each span. This allows the model to account for variations in vegetation density and species-specific risk factors, improving the accuracy of failure rate predictions and supporting more targeted vegetation management strategies.

b) Updated plot below:




c) The vegetation wind sensitivity curves presented in SDG&E's wildfire risk model are also based on a log-log regression model, which captures the exponential relationship between maximum wind gust and failure rate for different tree species and conductor types.

The general form of the log-log regression equation used is:

$$ln(Y)=\beta 0+\beta 1\times ln(X)+\beta 2\times ln(X*\mathrm{X})$$

Where: $\beta 0$ is the constant and $\beta 1$ is the independent variable coefficients and $\beta 2$ represents the coefficient for independent variable interaction terms

| # | Feature | Coeff | Comments |
|---|---|---|---|
| 1 | const | -7.4269 | constant |
| 2 | log_wind_gust_max | 0.1351 | Log-transformed value of the wind gust observed at the span, calculated as:<br><br>log(Wind Gust)<br><br>where Wind Gust is the maximum gust speed observed (in mph). |
| 3 | District_Beach Cities | 0.1460 | Categorical variable representing SDG&E's service territory districts |
| 4 | District_Metro | -0.4070 | Categorical variable representing SDG&E's service territory districts |
| 5 | District_Mountain Empire | -0.0426 | Categorical variable representing SDG&E's service territory districts |
| 6 | District_Orange County | -0.0937 | Categorical variable representing SDG&E's service territory districts |
| 7 | District_Ramona | 0.1336 | Categorical variable representing SDG&E's service territory districts |
| 8 | District_Eastern | -0.3409 | Categorical variable representing SDG&E's service territory districts |
| 9 | log_W_wire_combination_AL--5/2 AWAC--#2 | -0.0306 | Interaction term between the log-transformed wind gust variable and conductor-specific attributes such as material, type, and size. |

| | | | |
|---|---|---|---|
| 10 | log_W_wire_combination_CU--B.STRD--#4 | 0.0571 | Interaction term between the log-transformed wind gust variable and conductor-specific attributes such as material, type, and size. |
| 11 | log_W_wire_combination_CU--B.STRD--#6 | 0.0358 | Interaction term between the log-transformed wind gust variable and conductor-specific attributes such as material, type, and size. |
| 12 | log_W_wire_combination_AL--ACSR--3/0 | 0.0200 | Interaction term between the log-transformed wind gust variable and conductor-specific attributes such as material, type, and size. |
| 13 | log_W_wire_combination_AL--ACSR--636 | 0.1730 | Interaction term between the log-transformed wind gust variable and conductor-specific attributes such as material, type, and size. |
| 14 | log_W_wire_combination_CU--B.STRD--1/0 | -0.0870 | Interaction term between the log-transformed wind gust variable and conductor-specific attributes such as material, type, and size. |
| 15 | wind_direction_at_max_wind_gust | -0.0006 | The wind direction observed at max wind gust. |
| 16 | Z_LATERALIDC_YES | 0.0019 | Categorical variable indicating if the span is part of the main feeder or belongs to a lateral segment |
| 17 | Z_MEASUREDLENGTH_buckets_(0, 100] | -1.7987 | Categorical variable representing span length, measured in feet. |
| 18 | Z_MEASUREDLENGTH_buckets_(100, | -1.8724 | Categorical variable |

| | | | |
|---|---|---|---|
| | 200] | | representing span length, measured in feet. |
| 19 | Z_MEASUREDLENGTH_buckets_(200, 300] | -1.7697 | Categorical variable representing span length, measured in feet. |
| 20 | Z_MEASUREDLENGTH_buckets_(300, 500] | -1.9860 | Categorical variable representing span length, measured in feet. |
| 21 | Max_Height | 0.0001 | The estimated maximum height of the tree. |
| 22 | Treecount_50 | -2.2509 | Categorical variable representing number of trees in proximity of the span. |
| 23 | Treecount_75 | -2.4475 | Categorical variable representing number of trees in proximity of the span. |
| 24 | Treecount_75+ | -2.7285 | Categorical variable representing number of trees in proximity of the span. |
| 25 | Never Trimmed | -1.0310 | Categorical variable representing how long ago the tree was trimmed. |
| 26 | trimmed 90 days | -0.9195 | Categorical variable representing how long ago the tree was trimmed. |
| 27 | trimmed 1 year | -1.0870 | Categorical variable representing how long ago the tree was trimmed. |
| 28 | trimmed 2 years | -0.9795 | Categorical variable representing how long ago the tree was trimmed. |
| 29 | trimmed 3 years | -1.0154 | Categorical variable representing how long ago the tree was trimmed. |
| 30 | trimmed 4 years | -1.2163 | Categorical variable representing how long ago the tree was trimmed. |
| 31 | trimmed More than 4 years | -1.1778 | Categorical variable |

| | | | |
|---|---|---|---|
| | | | representing how long ago the tree was trimmed. |
| 32 | total_active_trees | -0.0005 | Total number of trees of the hexagon of the span. |
| 33 | log_Species_Century_Plant_percentage | -0.0014 | Log-transformed value of the percentage of a species. |
| 34 | log_Species_Eucalyptus_percentage | -0.0171 | Log-transformed value of the percentage of a species. |
| 35 | log_Species_Oak_percentage | -0.0009 | Log-transformed value of the percentage of a species. |
| 36 | log_Species_Other_percentage | 0.0057 | Log-transformed value of the percentage of a species. |
| 37 | log_Species_Palm-Feather_percentage | -0.0145 | Log-transformed value of the percentage of a species. |
| 38 | log_Species_Pepper_California_percentage | 0.0091 | Log-transformed value of the percentage of a species. |
| 39 | log_Species_Pine_percentage | -0.0113 | Log-transformed value of the percentage of a species. |
| 40 | log_Species_Silk_Oak_percentage | -0.0008 | Log-transformed value of the percentage of a species. |

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This update will be reflected in the model inputs and outputs included in the upcoming GRC filing, ensuring that the most current and comprehensive data informs risk quantification and mitigation planning.

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MGRA-3-2 Regarding the Reply Comments of San Diego Gas & Electric Company on its 2026-2028 Wildfire Mitigation Plan R1, Proposed Mitigation for 20 top riskiest circuits (Table 6-4), p. 5.

a. Provide, using any updates, a version of the Table that includes columns for i) SDG&E's proposed hardening start year, and ii) SDG&E's proposed hardening completion year.

**SDG&E Response Q.3-2a:**

Please refer to latest OEIS Table 6-4 in SDG&E's 2026-2028 Wildfire Mitigation Plan R2, which details planned mitigation activities for top riskiest circuit segments during the 2026-2028 WMP Cycle. Also see columns "Planned Mitigation Activity" and "Year Planned for Mitigation Activity," respectively, to see the proposed hardening mitigation activity and the proposed hardening start year. For example, SUG is planned for Circuit Segment 358-682F beginning in 2028.

MGRA-3-2 Regarding the Reply Comments of San Diego Gas & Electric Company on its 2026-2028 Wildfire Mitigation Plan R1, Proposed Mitigation for 20 top riskiest circuits (Table 6-4), p. 5.

b. For any groups of upstream feeder segments that SDG&E proposes for

"bundling" please provide an aggregated list for each proposed bundle showing:

a) Upstream feeder segments comprising the bundle

b) Bundle aggregated total wildfire risk before mitigation

c) Bundle aggregated total wildfire risk after mitigation

d) Bundle aggregated PSPS risk before mitigation

e) Bundle aggregated PSPS risk after mitigation

f) Bundle aggregated CBR for proposed mitigations

**SDG&E Response Q.3-2b:**

At this time, SDG&E is unable to provide updates on its bundling strategy for Strategic Undergrounding (SUG) and Combined Covered Conductor (CCC) segments. SDG&E is actively reviewing and prioritizing feedback received from multiple sources, including the 2025 RAMP SPD Evaluation Report, WMP and RAMP workshops, and intervenor feedback trends gathered through formal data requests.

Concurrently, SDG&E is exploring updates to its WiNGS-Planning model to potentially incorporate several key enhancements, including (not an exhaustive list):

- Updated Technosylva wildfire consequence modeling outputs
- Revised ICE 2.0 reliability valuations (dollars per Customer-Minutes Interrupted for Residential and Non-Residential customers)
- Evaluation of risk aversion scaling inclusion/exclusion
- Integration of net O&M cost savings into the cost-benefit ratio formula
- Reassessment of feeder-segment prioritization criteria, including risk rankings and cost-benefit ratios

These updates are expected to significantly impact SDG&E's risk baselines, tail risk quantification, and estimated risk reductions, all of which directly influence how segments are grouped and prioritized for mitigation. As a result, the bundling strategy remains under evaluation and is highly sensitive to changes in modeling assumptions and prioritization logic.

**SDG&E Response Q.3-2b: Continued**

These efforts reflect SDG&E's commitment to continuous improvement, regulatory alignment, and data-driven planning. SDG&E remains focused on targeting wildfire mitigation strategies towards the most high-risk and cost-effective areas, and will provide clear, well-supported documentation of that alignment in its 2028 GRC filing.

Summary tables and supporting documentation will be included in the GRC to assist SPD and stakeholders in evaluating SDG&E's updated bundling strategy and its alignment with risk-informed decision-making principles.

MGRA-3-3 SDG&E provides several references to support its use of an exponential scaling function for risk aversion. The references it cites refer to risk aversion in terms of fatalities, and therefore support safety risk aversion. Please provide any references supporting SDG&E's contention that an exponential risk aversion function can be or has been used to support:

a. Financial risk

b. Reliability risk

**SDG&E Response Q.3-3:**

Historically, the Multi-Attribute Value Function (MAVF) framework was used to evaluate safety, reliability, and financial risks independently, applying weighted scores to each attribute. However, the Commission has since transitioned to a cost-benefit framework, which monetizes all risk attributes—safety, reliability, and financial—into a common unit of measurement: dollars. This shift was made specifically to enable direct comparison across different types of risk and mitigation alternatives, regardless of which attribute they primarily address.

Under this cost-benefit framework, one dollar of safety risk reduction is treated equivalently to one dollar of reliability or financial risk reduction. Therefore, applying a risk aversion scaling function to monetized risk values is both mathematically valid and consistent with risk-informed planning principles, provided it is applied uniformly across all attributes.

SDG&E and SoCalGas use equivalent fatality-based scaling to reflect risk aversion in their models. This approach is grounded in well-established decision science and utility theory (risk attitude) in risk management best practices. Functions such as power law, exponential, and other non-linear transformations are commonly used to represent risk-averse behavior, especially in the context of low-frequency, high-consequence events like wildfires. These functions reflect the reality that the perceived impact of a risk increases disproportionately with its severity.

While many academic references focus on safety applications (e.g., fatalities), the mathematical structure of risk aversion functions is equally applicable to financial and reliability domains, especially when all attributes are expressed in monetary terms. Once risks are monetized, the application of power function with exponent 1.47 scaling becomes a valid and risk-informed method for prioritizing mitigation strategies across all risk types.

SDG&E would like to clarify that its risk attitude function is based on a power law formulation, specifically of the form x^1.47, and not an exponential function. It is important to distinguish between these two mathematical forms, as they exhibit

**SDG&E Response Q.3-3: Continued**

fundamentally different behaviors, which can lead to different interpretations and conclusions in risk modeling.

Importantly, the power function f(x)=x^1.47 lies between a linear (f(x)=x) and a quadratic (f(x)=x^2) polynomial, meaning it grows at a moderate rate, faster than linear, but far less aggressively than exponential growth. In contrast, an exponential function (e.g., e^x) is a continuously compounding function, where the rate of increase accelerates rapidly with larger inputs.

SDG&E remains committed to transparency and welcomes further discussion on how risk aversion is modeled and applied consistently across safety, reliability, and financial attributes within the cost-benefit framework.