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Office of Energy Infrastructure Safety
Natural Resources Agency

COMMENTS OF THE GREEN POWER INSTITUTE ON THE 2022 WMP UPDATES OF THE LARGE IOUS

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Gregory Morris, Director
Zoe Harrold, Scientist
The Green Power Institute
a program of the Pacific Institute
2039 Shattuck Ave., Suite 402
Berkeley, CA 94704
ph: (510) 644-2700
fax: (510) 644-1117
gmorris@emf.net

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The Green Power Institute (GPI), the renewable energy program of the Pacific Institute for Studies in Development, Environment, and Security, provides these *Comments of the Green Power Institute on the 2022 WMP Updates of the Large IOUs.*

Introduction

The GPI performed a review of the IOUs' 2022 WMP Updates with a general focus on risk modeling and the reduction of green waste from vegetation management mitigations. Our comments and recommendation cover the following topics:

- The projected increase in electric costs for ratepayers between IOUs varies substantially.
- GPI supports the proposal by Will Abrams to tie activities and mitigations in the WMP plans to ignition drivers that resulted in Utility-caused destructive wildfires.
- Efforts to mitigate environmental impacts of vegetation management are overly focused on permitting.
- IOU MAVF methods appear to still reflect value caps.
- IOUs should perform a more compete assessment of the possible impacts of climate change on both PoI and consequence.
- A forward look at HFTD mapping.
- Risk models and data quality.
- WMP guidelines should require that IOUs provide a table of mitigation lifetimes used to determine RSE values in future WMPs.
- PG&E's description of research with CalPoly State is ambiguous.
- PG&E should clarify how they are determining tree species for past data.
- The next WMP cycle should require IOUs to propose a new build standard for locations in HFTD.

- Model informed risk-based decision making is still not a transparent process.
- IOUs have yet to successfully model risk on egress/ingress routes.

The projected increase in electric costs for ratepayers between IOUs varies substantially

The WMP requires IOUs to report the projected increase in ratepayer utility bill based on the planned mitigations for the coming year and past years covered by the 2020-2022 3-year WMP plans and annual updates. Monthly bill increases for ratepayers due to planned 2022 wildfire mitigation activities are approximately three times higher for SCE ($ 6.90, SCE 2022 WMP, p. 28) and PG&E ($6.13, PG&E 2022 WMP, p. 42) customers compared to costs projected by SDG&E ($1.92, SDG&E 2022 WMP, p. 17). WMP cost differences between IOU plans were even more pronounced in 2021, with projections from PG&E, SCE, and SDG&E totaling $11.63, $1.60, and $0.00 per month for ratepayers, respectively. GPI recognizes that IOU WMPs have varying levels of maturation as well as a wide spread of territory size and characteristics (e.g. customer count, grid configuration, tree species and coverage) that can result in divergent wildfire mitigation costs. While the OEIS and WMP process does not approve or formally evaluate WMP expenditures this substantial discrepancy warrants a more detailed review to assess the underlying causes and whether cost savings are possible for PG&E and SCE.

Further, we anticipate that annual wildfire mitigation costs for capital expenditures and perhaps even operations/maintenance (e.g. efficiency improvements, model maturation) should eventually decrease over time. For example, as utility investments into grid hardening (e.g. Covered Conductor [CC], undergrounding, fuse replacement) reach high penetration and/or become standard practice for replacement and new builds in HFTDs. Long-term WMP cost effectiveness will likely constitute an optimized combination of near and long-term investments, for example vegetation management (1–3-year mitigation) versus CC and undergrounding (20–40-year mitigation). GPI recommends requiring a 10-year operations and maintenance as well as capital cost outlook in the next 3-year WMP cycle in order to better evaluate how IOU strategies for near and mid-term wildfire planning may affect long-term cost effectiveness and possible cost reduction. Some IOU

mitigation schedules already extend out to longer planning horizons (e.g. fuse replacements, tree attachments) making this assessment a reasonable planning request for the next WMP cycle.

GPI supports the proposal by Will Abrams to tie activities and mitigations in the WMP plans to ignition drivers that resulted in Utility-caused destructive wildfires

Section 3.2 (a) "Ratepayer Impact Due to Utility-Related Ignitions" includes lists of utility caused wildfires. GPI supports the proposal by Will Abrams to tie past utility-caused wildfire ignition drivers to risk mitigation efforts in the WMP plans. Past utility-caused wildfires present optimal case studies to assess the probability that current WMP mitigations and activities would prevent past wildfires. Future WMPs should include internal references to planned mitigation activities that would prevent or reduce the risk of past wildfire ignition sources as well as the quantified annual risk mitigation relative to baseline conditions in the year the fire occurred.

Efforts to mitigate environmental impacts of vegetation management are overly focused on permitting

In WMP Vegetation Management Section 7.5.3.1, "Additional efforts to manage community and environmental impacts," PG&E focuses entirely on permitting and legal disputes challenges (PG&E 2022 WMP, p. 631-633). These challenges are addressed with customer communication and outreach to facilitate VM work access and reduce customer disputes. PG&E's forward-looking plan from 2023-2028 is narrow and only includes tracking related communications in order to inform improvements. PG&E also describes removal of slash and woody debris from vegetation management activities as well as locations scarred by wildfire. PG&E's approach to managing these VM residues and their environmental impact has not advanced over the course of the three-year WMP cycle. Furthermore, they have no forward-looking plans to develop more sustainable VM residue pathways that will reduce the environmental impacts of their VM program over the next five years, through 2028. This marks nearly a decade of time over which PG&E's VM residues have not been clearly routed to end-use pathways such as biomass generation or wood material production that could reduce the environmental impacts of VM work.

Notably, PG&E is also the largest IOU territory with by far the most HFTD area, HFTD distribution line mileage, and substantial forested service territory.

Similar to PG&E, SCE's VM environmental impact section focuses on customer/stakeholder communication, permitting challenges and environmental compliance. Future work focuses on improving customer communication and maintaining environmental compliance. SCE's slash management follows typical leave-in-place or removal approaches that do not reduce green waste. They do, however, continue to explore alternatives to traditional VM approaches including ruminant grazing, replanting, and/or tree replacement with low-growing vegetation that does not require trimming (i.e. IVM). This builds upon the base requirements by developing longer term solutions that could reduce green waste. However, the extent and approaches deployed for IVM remain generally opaque and the programs seem to remain in a pilot phase. SCE also has yet to release their third-party study on fuel management best practices, launched in 2020.

In contrast, SDG&E contracted a third-party vendor that processed received VM residues into recyclable material, totaling 46 percent of green waste diverted to recycling facilities. SDG&E also launched a tree planting program that provided 11,000 trees to stakeholders and communities. Forward plans include providing 10,000 trees annually. SDG&E's progress toward VM residue management that includes waste diversion and sustainable vegetation replacement is a benchmark for best practices to date. GPI recommends that all IOUs begin to develop VM impact mitigation plans in the upcoming 3-year WMP cycle that both divert green waste, replace trees or other vegetation types removed during VM work, and reduce the long-term need for extensive tree trimming and slash production. To promote progress we recommend requiring reporting on percent of slash removed versus left in place, and percent of removed VM residues diverted to recycling streams versus green waste.

IOU MAVF methods appear to still reflect value caps

PG&E notes that they removed the value caps on their MAVF safety, reliability, and financial attribute ranges for 2022. Based on the 2022 WMP alone is it not clear whether

SDG&E is capping their attribute ranges. WMPs should provide a complete description regarding MAVF attribute ranges, whether range caps are used, and the most up to date maximum values for each attribute determined for the utility territory (i.e. the highest value applied in the most granular MAVF application). These data will help inform relative MAVF scoring and granular risk maximum/ranges between Utilities.

IOUs should perform a more compete assessment of the possible impacts of climate change on both PoI and consequence

PG&E states that, for their risk bowtie analysis, "The impact of climate change was assumed to amplify the consequence of all ignitions rather than increase the percentage of ignitions occurring when a Red Flag Warning (RFW) is in place (PG&E 2022 WMP, p. 60)." However, climate change could conceivably increase short term and long-term percent or probability of ignitions. For example, drought and heat could lower LFM and DFM, increasing the likelihood that a risk driver causes an ignition. The IOUs should conduct a more thorough assessment of the potential change in wildfire risks, both PoI and consequence, associated with climate change in the near and long-term planning horizons.

A forward look at HFTD mapping

PG&E notes that CPUC remains responsible for developing updated HFTD maps (PG&E 2022 WMP, p, 78). GPI recommends clarifying in the next WMP cycle whether HFTD mapping has shifted jurisdiction to the California Natural Resources Agency and OEIS, or whether the CPUC will continue to develop updated HFTD maps.

PG&E has an active annual HFTD zone assessment approach that includes third party review in order to assess HFTD zone additions and removal. Expanding this approach to measure trends in HFTD border lands over time could provide a gauge of wildfire risk "tipping-points" leading to HFTD qualifying conditions and future inclusion in HFTD maps. GPI recommends future WMPs efforts that track near to long-term trends in HFTD buffer zone environmental conditions (e.g. LFM, DFM) that may point to a region developing elevated wildfire risk (e.g. drought, temperature on account of climate change). Tracking these trends, especially near the borders of HFTD Tier 2 and Tier 3

regions, may provide more lead-time for system hardening and vegetation management mitigations prior to experiencing elevated fire risk. This would allow for pre-emptive mitigations, versus the current model of performing reactive mitigation work with long lead-times after PoI and consequence risk is elevated to Tier 2/3 levels.

IOUs generally appear to apply this concept loosely via HFTD buffer zones. PG&E mentions "While System Hardening is not targeted in non-HFTD areas, covered conductor installation or System Hardening may be considered for Buffer Zones immediately adjacent to HFTD boundaries, or in response to reliability issues in non-HFTD areas, to limit the impacts due to recurring outages (PG&E 2022 WMP, p. 433)." SCE references using a 600-foot buffer for mitigations activities to reduce wildfire risk in WUI and regions that border HFTD (SCE 2022 WMP, p . 39). An assessment of IOU's current HFTD buffer zone distances and activities is needed to establish best practices that enable preemptive wildfire risk mitigation versus the current model of reactive mitigations. This could include establishing formal HFTD buffer distances that require more rigorous condition (e.g. LFM, DFM, etc.) tracking and risk modeling capable of informing near and mid-term trends in wildfire risk that warrant risk mitigation before Tier 2/3 conditions are achieved.

Risk models and data quality

Model fit metrics – SCE only references using, but does not provide ROC-AUC curves for their machine learning (ML) models (SCE 2022 WMP, p. 104). PG&E (2022 WMP, p. 146) and SDG&E both provide ROC-AUC values for ML models, and SDG&E provides a table with additional R-squared values for linear model fits (SD&GE 2022 WMP, p. 92). GPI recommends that the 2022 WMP updates should not be approved unless and until model fit values are provided for at least the major ML derived planning models (e.g. PoI). Going forward, WMPs should be required to include model fit metrics for all utility-developed models used in risk-based decision making. Model fit metrics will provide a gauge of model/sub-model improvement over time as well as a transparent metric for which models and/or sub-models require the most refinement or introduce the most error/uncertainty. Reporting goodness of fit metrics is also a standard scientific practice.

Models that lack goodness of fit metrics should be under additional scrutiny regarding their usefulness for risk-based decision making.

Model sensitivity testing – PG&E is performing a sensitivity analysis on its Wildfire Distribution Risk Model (PG&E 2022 WMP, p. 145). SDG&E describes that: "A sensitivity analysis is employed to validate the RSE and mitigation sections of the WiNGS-Planning model. In this analysis, constants, including cost-per-mile estimates and RSE thresholds, are adjusted to see how sensitive the mitigation recommendations are to different size variable adjustments (SDG&E 2022 WMP, P. 128)." SCE, however, does not perform a sensitivity analysis on its risk assessment and mapping and rather lists "Perform Sensitivity analysis" and "Perform independent validation" as "*potential* future focus" objectives for the 2022-2023 110-year planning horizon. GPI recommends setting an expectation that SCE plan and perform sensitivity analyses on planning models and RSE values in their next 3-year WMP plan. All IOUs should be required to describe the outcomes of their sensitivity analysis. These analyses can indicate how sensitive total wildfire risk and RSE values are to changes in input variables. Output results that are highly sensitivity to variables with high uncertainty might suggest that risk-modeled values (e.g. RSE) are more qualitative than quantitative and could guide targeted improvements to key quantitative risk and RSE input values.

WMP guidelines should require that IOUs provide a table of mitigation lifetimes used to determine RSE values in future WMPs

The IOUs generally do not adequately explain the quantitative inputs into RSE calculations including benefit length and quantifying RSE effectiveness. For example, SDG&E uses a replacement asset risk reduction duration of 20 years (SDG&E 2022 WMP, p.107). Mitigation lifetime has a substantial effect on RSE. Large variations in mitigation risk reduction lifetimes could substantially affect RSE variability between IOUs as well as mitigation selection and preferences within IOUs. This may be especially true for emerging mitigations such as covered conductor, which is only now seeing widespread use, and that may not yet have robust estimates for longevity based on field deployment-

derived *in situ* data. GPI recommends that future WMPs require a table of mitigation-specific RSE inputs, including assumed lifetime of the mitigation.

Quantifying risk reduction for each mitigation activity also remains a shortcoming in the 2022 WMPs. While not a trivial undertaking quantifying the risk reduction potential for each mitigation is obviously a foundational input for determining mitigation RSE and therefore optimizing granular risk mitigation approaches. SDG&E's Section 4.4 Research Proposals and Findings provide a solid example of the research approached needed to quantify mitigation effectiveness for reducing probability of ignition. For example, their study to quantify ignition probability of CalFire approved fuses compared to non-approved expulsion fuses uses field data from ongoing mitigation activities to verify anticipated PoI risk reduction (SDG&E 2022 WMP, p. 62). Results of this work and other field-derived datasets can leverage and improve the quantification of risk reduction associated with in-progress mitigation efforts.

GPI remains concerned that the methods used to determine risk reduction values for mitigation activities, including for both PoI and consequence risk, are not transparent in the 2022 WMPs. For example, PG&E states that "Mitigation data representing the exposure, effectiveness, and benefit length of a mitigation is verified through a quality control process undertaken by SMEs who review the data and perform validations of it (PG&E 2022 WMP, p. 120)." This description of mitigation effectiveness quantification and verification is vague and relies on SMEs, with no clear indication of performing data-driven assessments of risk reduction. The next 3-year WMP cycle should include descriptions of data-driven risk reduction quantification efforts needed to refine RSE values and better inform mitigation selection and anticipated risk buy-down based on Utility mitigation plans.

Standardizing data update frequencies – GPI recommends exploring the need to establish data update frequency standards for risk modeling inputs such as vegetation and population data sets. For example, PG&E TABLE PG&E-4.5.1-4: 2022 WDRM V3 DATA SETS (PG&E 2022 WMP, p. 131) has "NA" in the collection frequency for most data inputs. Data collection periods for each of the data sets vary, with some as far back as 2010 (i.e.

WorldPop – population density), 2011 (i.e. GAP/LANDFIRE National Terrestrial Ecosystems data - produced by USGS), and 2014 (i.e. TreeMap). It would be prudent to determine whether and when input datasets such as vegetation and population mapping no longer adequately reflect on-the-ground conditions. Notably these are also public datasets not necessarily designed or maintained for the purpose of up-to-date wildfire risk modeling. It may therefore be necessary to establish data update frequencies that can be communicated to third party data collectors and that encourage timely updates of public or purchasable datasets.

Dataset imputation methods – Data imputation involves the replacement of missing data values (e.g. "NA" entries) with numbers. SDG&E describes data imputation methods that utilize a typical approach of replacing dataset NA values with attribute averages (SDG&E 2022 WMP, p. 90). In contrast PG&E replaces the NA values in some risk modeling datasets with zeros, specifically in the WorldPop and Salo Sciences and PG&E LiDAR Survey datasets (PG&E 2022 WMP, p. 139). Replacing dataset NA values with zeros can substantially skew risk modeling outcomes. For example, missing population data (i.e. NA) that is set to zero could substantiality underestimate wildfire consequence in locations with non-zero populations. LiDAR vegetation data NA values erroneously set to zero could underestimate granular PoI and consequence risk. It is also unclear how many NA values PG&E replaced with zeros, what percentage of the dataset the replacements constituted, and whether NA entries were biased toward specific conditions (e.g. dispersed rural populations, communities, tribes/reservations). PG&E's WMP should not be approved until they provide a complete report on data imputation methods, especially the potential consequences of changing NA values to zeros.

Data and model uncertainties remain a challenge – Descriptions of input data and model uncertainty in the IOU WMP plans only mark a starting point for addressing and reducing error in wildfire risk quantification. For example, PG&E describes the uncertainty for PG&E events including outage and ignitions as:

> Much of this data is collected in the field by PG&E staff, which can lead to various uncertainties. Some of these events (especially ignitions) go through a desktop review process that can reduce uncertainty (PG&E 2022 WMP, p. 136).

This description is vague and does not establish the data elements with substantial uncertainty (e.g. location, cause etc.), how the desktop review addresses uncertainty, or even how many of these events are subjected to desktop review (e.g. 10 percent?). "Some" is a vague description for a review of data validation/verification methods and is not an adequate description for how uncertainty is assessed and mitigated. IOUs should be required to improve equivocal language used in describing data uncertainty and data validation/verification methods. The next 3-year WMP cycle should advance these methods to provide more statistically robust data validation/verification plans that can reduce input data error and therefore improve model uncertainty.

Outage and ignition input data filters – The 2021 workshop on wildfire risk modeling, including machine learning models, raised the question as to whether all utilities were removing risk events associated with weather conditions unlikely to result in an ignition and wildfire (e.g. snow and ice storms). The 2022 WMPs begin to address the application of a data filter to remove risk events that occur under weather conditions unlikely to lead to wildfire. For example, SDG&E states that "The outage records used for [PoI] model training do not include any events that are caused by crew-related incidents, lightning, ice, snow, or intentional shutoffs (SDG&E 2022 WMP, p. 89)." In contrast PG&E uses a time-based filter, stating:

> It is assumed that events from June-November, the typical timing of fire seasons, are representative of all events capable of producing wildfire risk. If the training data for the WDRM were to include events caused by winter storms, icing, and other causal processes not compatible with ignition and wildfire spread, the pattern of model predictions would be influenced by events that contribute little or no wildfire risk. To avoid exposing the model to misleading data, the training events are restricted to June through November. This does not require the assumption that no wildfires are possible in other months, but only that any ignitions and wildfires that do occur would have the same relationship with the model covariates as the ones the model is already trained on (PG&E 2022 WMP, p. 139).

While well intentioned GPI does not support filtering outage and ignition data based on a set wildfire season. Wildfire risk and risk conditions are not limited to "wildfire season", which is also a variable timeframe dependent on stochastic weather patterns and fluctuating climate trends that include typical climate cycles as well as climate change.

Risk event inputs for wildfire risk modeling should be removed on a case-by-case basis to eliminate risk events that occurred during conditions when wildfires were improbable (e.g. snow and ice events).

PG&Es description of research with CalPoly State is ambiguous

PG&E's proposed research titled "California Polytechnic State University, San Luis Obispo (Cal Poly) WUI Fire Information, Research, and Education (FIRE) Institute" is too vague. The research purpose states:

> The purpose of the Cal Poly FIRE Institute is to make significant contributions to solving the WUI fire problem through integrated and applied research and education that innovates, informs policy, disseminates information, and educates students and professionals. In 2021, PG&E partnered with, and advised on the direction of research, and associated activities by, the FIRE Institute as it works toward the development of solutions for sustainable fire-resilient communities and safer and more effective fire-preparedness and response operations through applied research and incorporation of technology (PGE 2022 WMP, p. 97).

PG&E provides no methods or data elements. The most concrete part of this research suggests a focus on WUI. How the work will improve wildfire mitigation within WUI is overly broad and ambiguous – that is, this research scope could encompass entire sections of the WMP and decades of work. PG&E should refine the research plan for this proposal or remove it entirely until they have developed a clearer objective. The general exchange of ideas and collaboration between PG&E and the Cal Poly FIRE Institute should be documented in the WMP introduction, rather than in the Research Proposals and Findings section.

PG&E should clarify how they are determining tree species for past data

PG&E indicates that they will use data as far back as 2008 to conduct their Targeted Tree Species Study regarding species most likely to cause ignitions (PG&E 2022 WMP, p. 105-107). PG&E should clarify: (1) which existing datasets and years have tree species data; and (2) if a dataset/year does not have species-level data, how they will ascribe tree species to data that predate species-level data collection.

The next WMP cycle should require IOUs to propose a new build standard for locations in HFTD

Stakeholder and intervenor queries during the WMP development process have raised questions regarding grid build and re-build standards for HFTDs going forward. This is particularly salient for areas that have been affected by wildfire and require grid repair and replacement. GPI supports stakeholder comments that have requested additional reporting on IOU's new, re-build, and replacement standards for the HFTD distribution grid in particular. In reviewing the WMP plans we noted that SCE REFCL pilot programs were producing positive results and included plans for pilot program expansion (SCE 2022 WMP, p. 31). In contrast, SDG&E encountered cost barriers to REFCL implementation, stating:

> The primary driver for costs associated with distribution circuits are more related to the rebuild of the overhead system currently serving the areas of the HFTD. …With approximately 70 substations and 285 distribution circuits serving the HFTD, the anticipated rebuild of infrastructure alone that would be needed to deploy REFCL would be incredibly costly and would not provide coverage or mitigation for any faults outside of single phase-to-ground types (SDG&E 2022 WMP, p. 79).

In this case, GPI questions whether forward looking grid design, implemented over time as replacements/new builds are required within HFTD, can enable more cost-effective technology upgrades and therefore wildfire mitigations in the future and over time. Initiating planning for updated HFTD grid design standards in the WMPs can also inform the need for future proceedings to establish grid design standards at the state (CPUC) level.

Model informed risk-based decision making is still not a transparent process

Based on the 2022 WMP, risk-based decision making that directly utilizes risk modeling outputs to inform optimal mitigation portfolios and prioritization is still a work in progress. Further the application of these model to inform specific mitigation activities is relatively opaque. For example, SDG&E explains that:

> Although WiNGS-Planning was developed in 2020, the model did not inform the entire scope of grid hardening work in the 2020 WMP. Additional details on this model are being

> shared because it represents the future framework that will be used to identify future strategies for mitigating wildfire. The use of WiNGS-Planning to inform priorities in the WMP is limited to some of the covered conductor and undergrounding scope identified for 2022 as well as the Standby Power Program (SDG&E 2022 WMP, P. 121)

and

> The key decisions being driven from the WiNGS-Planning model are how to most efficiently and effectively apply wildfire and PSPS mitigations in the back country. Currently, the main mitigations being proposed in the model results are undergrounding and covered conductor, starting in 2023. The model has been reviewed by multiple internal SMEs to validate any assumptions and model outputs (SDG&E 2022 WMP, p. 129)

GPI recommends developing more specific reporting requirements for the coming 3-year WMP cycle in order to provide more transparency into how wildfire risk planning models are informing mitigation selection and prioritization. For example, adding specific prompts to list all mitigation selections informed by risk model outputs (e.g. VM, IVM, CC), location attributes where model outputs are most applicable (e.g. backcountry), examples of decisions where wildfire risk planning model outputs were used, and how they were used (e.g. their weight in the decision-making process or overall risk ranking).

IOUs have yet to successfully model risk on egress/ingress routes

IOUs have repeatedly attempted to include egress wildfire risk conditions in quantitative risk modeling. SCE appears to have made the most progress with risk modeling along egress routes, stating:

> SCE has integrated the WRRM data with a new Severe Risk Area framework developed jointly by Technosylva and SCE to better represent risk in locations with egress concerns, as well as high wind conditions not fully captured by ignition propagation models. SCE intends to leverage this framework to guide the evaluation and deployment of enhanced mitigations supplementing covered conductor, including alternative grid hardening measures, or targeted undergrounding where feasible (see Section 7.1.2.1 for additional information). In 2022 SCE will enhance the egress and general wildfire consequence modeling to better support its integrated grid hardening strategy (SCE 2022 WMP, p. 60).

At this time, however, IOUs consider risk on egress routes as a qualitative factor contributing to mitigation selection and prioritization. For example, SCE describes:

> SCE developed a new framework to identify locations in which the wildfire risk to those locations is not fully captured by ignition simulations alone. The Severe Risk Area framework allows SCE to consider qualitative risk factors, such as population egress, historical fire frequency, canopy cover and/or density, the deployment of existing mitigations, as well as locations likely to exceed PSPS thresholds even with covered conductor installed. This framework is being finalized in 2022 for use in development of future scope and could include undergrounding of some circuit segments (SCE 2022 WMP, p. 30).

SDG&E plans to include egress in risk modeling, but it is unclear how far along this goal is. An example of SDG&E egress considerations is provided in their strategic underground project description:

> The design team should consider egress and ingress as they progress through the design phase and should select the most appropriate design for the specific location. For example, if egress and ingress is an issue at a construction site, the designer may consider using native backfill instead of slurry fill, working space, traffic coordination, and the type of equipment used to minimize potential traffic issues (SDG&E 2022 WMP, p. 392).

PG&E also notes future plans to include egress in wildfire risk modeling, including in their wildfire consequence model. Notably the issue of egress considerations was raised in issue PGE-5.1C (See PGE 2022 WMP, p. 230). PG&E's response amounts to a work in progress, however, like the other IOUs there is no clear and systemic method though which risk ranking and wildfire mitigation work is prioritized on ingress/egress routes. GPI strongly recommends that all utilities be required to provide a complete description of how they are currently factoring in egress/ingress routes in their mitigation selection and work prioritization for 2022, prior to the completion of anticipated integration of egress in risk models. This should include identifying specific, and critical egress and ingress routes in their territory and how/when they are addressing risk in those locations. Further, the IOUs should be required to provide a summary of the outcome of egress integration into wildfire risk model and how the outputs will be used to inform mitigation selection and prioritization.

All IOUs should report on how they will address Aeolian vibration wear and tear on CC

Comments in the 2022 WMP workshop on March 10, 2022, noted the occurrence of more rapid covered conductor wear and tear associated with aeolian vibrations. SCE's 2022 WMP includes a vibration dampener retrofit, stating:

> Vibration dampers can stop wind-driven vibration (known as Aeolian vibration) that may lead to conductor abrasion or fatigue over time (see Figure SCE 7-42 below). This is an issue for both bare and covered conductor. However, covered conductor may be more susceptible to vibration because of the covering's smoothness (perfect cylinder) and the reduction of strand movement due to the covering (SCE 2022 WMP, p. 303)."

SDG&E states: "SDG&E also requires the use of vibration dampers, where necessary, to mitigate conductor damage due to Aeolian vibration (SDG&E 2022 WMP, p. 52)." PG&E should clarify if it integrates or requires an equivalent aeolian vibrational dampening retrofit.

Conclusions

We respectfully submit these comments and look forward to reviewing SMJU wildfire mitigation plans and contributing to reporting guidelines for the next 3-year WMP cycle.

For the reasons stated above, we urge the OEIS to adopt our recommendations herein.

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Respectfully Submitted,

Gregory Morris, Director
The Green Power Institute
a program of the Pacific Institute
2039 Shattuck Ave., Suite 402
Berkeley, CA 94704
ph: (510) 644-2700
e-mail: gmorris@emf.net