PACIFIC GAS AND ELECTRIC COMPANY
PG&E Ref. DRU13828-Misc.-OEIS
Data Request OEIS
Requester Event Ref. No.
Requester DR No. Energy Safety-DR-EUP-24-02

Requester: Brant, Simone
Request Date: June 17, 2024
Response Date: July 01, 2024

Question No. 001:

Please provide information requested as it pertains to Electrical Undergrounding Plan (EUP) reliability modeling.
Below are several scenarios for a limited model of Outage Program Risk. For each scenario, please comment on the expected time it would take PG&E to develop the model and any major concerns with using said model for EUP purposes. For each case, if there is a significant difference in the difficulty of performing the separate, collective, and ablation analyses, please specify which analyses are more difficult and why. If there is a difference at the system and portfolio level for any of the listed scenarios, please explain why. If there are any significant differences in the development of the PSPS/EPSS models for any scenario, please indicate which cases and explain why.
a. A model that examines a mitigation on a single isolatable circuit segment at a time and computes likelihoods of PSPS/EPSS and the consequences of PSPS/EPSS to customers on that segment alone based purely on back casting historical data.
b. The same as (a) but using projected weather/climate factors.
c. A model that examines a single mitigated isolatable circuit segment at a time and computes likelihoods of PSPS/EPSS being called on that isolatable circuit segment and the consequences of PSPS/EPSS on that isolatable circuit segment and 'downstream' customers based purely on back casting historical data.
d. The same as (c) but using projected weather/climate factors.
e. Same as (a), but also includes likelihood of the segment being de-energized due to a PSPS/EPSS event on an upstream circuit segment.
f. Same as (e) but using projected weather/climate factors.
g. Same as (c), but also includes likelihood of the segment being de-energized due to an upstream PSPS/EPSS event.
h. Same as (g) but using projected weather/climate factors.
i. Same as (e) but also considering all other proposed EUP Projects.
j. Same as (f) but also considering all other proposed EUP Projects.
k. Same as (g) but also considering all other proposed EUP Projects.
l. Same as (h) but also considering all other proposed EUP Projects.
m. A model with similar levels of granularity, specificity, and accuracy as the WDRM (Wildfire Distribution Risk Model)
n. Is there a modeling gap between scenario (l) and (m)? If so, please explain what factors or features are absent in scenario (l).

Response to Question No. 001 Response No. 002:

On July 5, 2024, PG&E met with Energy Safety to discuss PG&E's responses to the data request Energy Safety-DR-EUP-24-02 submitted on July 1, 2024. During the meeting, Energy Safety provided additional context about the reliability modeling requirements in the Electric Undergrounding Plan (EUP). Based on this discussion, PG&E has refined the estimated timeframe for the development of the reliability model, it is expected to take approximately one year to build the reliability tools based on the Draft Guidelines.

Question No. 002:

Please provide information requested as it pertains to PG&E-designated 'Hybrid Projects.'

a. In PG&E's May 29th, 2024 comments on draft guidelines, PG&E described a "hybrid" approach or "hybrid distribution hardening" as "a circuit segment that is hardened using a combination of covered conductor, undergrounding, and/or line removal with remote grid" and "recommends defining hybrid electric distribution hardening as a sub-project that consists of at least 80 percent undergrounding and up to 20 percent overhead covered conductor or line removal."1 The following questions are intended to clarify, and help Energy Safety better understand, this recommendation. Please confirm this is PG&E's recommended definition or provide an updated definition with any changes.

b. Please confirm whether it is PG&E's recommendation to apply the "hybrid" designation at the "project" or "subproject" level. The definition provided states "subproject"; however, further comments discuss the percentages (80% and 20%) of circuit segments, which implies project level. The requested table below assumes the project level. (Note that there are further questions regarding subprojects below)

c. In PG&E's proposed definition of "hybrid distribution hardening," is there a definitive list of alternate mitigations that could potentially be included in the 20% non-undergrounding work?

d. Can PG&E elaborate on how and why a circuit segment would become a hybrid distribution hardening project? Please explain the process of scoping a hybrid project and provide an example that illustrates how and why other mitigations were chosen over undergrounding.

d1 Is the reason for using an alternate mitigation always due to a better cost/risk performance, a physical limitation (such as a river crossing or granite), a combination of both, or some other factor? Please explain.

d2 Is there a distinction between how an alternative mitigation will be recorded on the EUP if the alternate mitigation is included because of cost/risk performance versus a physical limitation?

e. Provide an .xlsx document that details the number of planned projects, or isolatable circuit segments, for each expected combination of underground and "hybrid" projects in PG&E's 2023-2026 Workplan. Include all expected mitigations. For each project or isolatable circuit segment, please report:

f. Provide a general cost comparison, per mile replaced, of each individual mitigation option (e.g. underground, covered conductor, remote grid, other). For remote grids, provide an average cost of the installation and average length of overhead line removed. What is the source for each cost estimate?

g. For the anticipated projects, how many isolatable circuit segments are typical on a given circuit?

h. Are there instances of planned projects in which only a portion of the circuit segment is undergrounded without required overhead hardening work or wildfire mitigation improvements on the remainder of the overhead section(s) of the circuit segment?

i. Provide specific details and examples on how seeking rate recovery through an alternate regulatory process, such as the GRC, for non-undergrounded portions would affect an undergrounding project. Is there a potential for construction delays, and if so, how long would these delays last? Are there scenarios where PG&E would have to return to a circuit segment to construct overhead hardening portions separately?

j. The next PG&E GRC cycle is 2026-2028. The EUP would likely not begin until 2027. Is it possible for PG&E to request covered conductor funding that would otherwise be considered part of a "hybrid project" in the 2026-2028 GRC? If this approach was taken, would this enable EUP undergrounding and

GRC-funded covered conductor portions that would otherwise be considered part of a "hybrid project" to be constructed at the same time? Specify any concerns or potential barriers to this approach. If PG&E believes this approach would be inferior to a "hybrid project" approach under the EUP, identify why and provide rationale.

Response to Question No. 002 Response No. 002:

Please reference *E02725.DRU13828_Energy Safety-DR-EUP-24-02_DR_OEIS_D001_Atch01.xlsx* for the information, submitted to Energy Safety on July 1, 2024. Please see the requested updates to the attachment on *DRU13828_Energy Safety_DR_OEIS_D002_Atch01.xlsx*.

Updates to 2e) Excel file:

In the initial Excel data file, six cells in column G (Other Mitigations) were missing data. They are now included in the Excel data file (*DRU13828_Energy Safety_DR_OEIS_D002_Atch01.xlsx*) to reflect consistency with column I (Other Mitigations Miles).

Updates to Sub-projects section:

Please see Underground Sub-projects (Column L), Covered Conductor Sub-projects (Column M), and Other Mitigation Sub-projects (Column N) for the number of hybrid projects that include undergrounding sub-projects, covered conductor sub-projects, and other mitigation sub-projects, respectively. The data we used in our response includes pre-2023 sub-projects so that we could report complete project data sets.

As indicated below, the sum of undergrounding sub-projects, covered conductor sub-projects, and other mitigation sub-projects do not always equal the number of sub-projects.

In cases where the sum of the mitigation-specific sub-projects is less than the number of sub-projects, the primary reasons are:

1. Sub-projects have not yet completed scoping, and therefore do not show mitigation-specific sub-projects; and
2. In fewer instances, some sub-projects are created with no associated miles to address work that enables other sub-projects in the same project (CPZ).

In cases where the sum of the mitigation-specific sub-projects is greater than the number of sub-projects, the reason is because certain *hybrid sub-projects* have multiple mitigation types, and the same hybrid subproject can be counted under covered conductor, undergrounding, and/or other mitigation types.

Please see Table 1 below for an illustrative example of this scenario.

Table 1 – Example of a CPZ with Hybrid Sub-projects

Sub-project	UG Sub-project	OH Sub-project	Other Mitigations
1	Yes	Yes	No
2	No	Yes	No
3	Yes	No	No
4	Yes	Yes	Yes
5	Yes	Yes	No
6	Yes	Yes	Yes

In this example CPZ, Table 1 shows six sub-projects consisting of five undergrounding sub-projects and five overhead sub-projects, and two other mitigations, a total of twelve sub-projects, which is more than the six sub-projects on this circuit segment. Here, the certain sub-projects are counted multiple times.