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TRANSMITTED VIA ELECTRONIC MAIL

DATA REQUEST

Request Date: June 17, 2024

Response Due: July 1, 2024

To: Dan Blair
D7BD@pge.com
Regulatory Relations Advocacy Manager
Pacific Gas and Electric (PG&E)
300 Lakeside Drive, Oakland, CA 94612

Originator: Simone Brant
simone.brant@energysafety.ca.gov

Data Request Number: Energy Safety-DR-EUP-24-02

Subject: Reliability Modeling, Hybrid Projects and Subprojects

INSTRUCTIONS

a. Provide all information in your possession, custody, or control, or the possession, custody, and/or control of your affiliates or agents, that is responsive to these data requests by the due date identified above.

b. Responses and documents may be produced and served electronically, but they shall be fully machine-readable and searchable.

c. If you have any questions about the meaning or scope of the data requests herein, direct such questions to the Energy Safety staff identified as the "Originator" of this request at your earliest opportunity.

   i. Lack of clarity on meaning or scope of requests, without prior request for clarification from the "Originator," will not be a permissible reason for incomplete responses and will be regarded as non-compliance with the request.

d. Identify the personnel (employees, consultants, agents, etc.) who provided information responsive to each of the data requests below. As used in this context herein, "identify" means to provide the full name, business address, and title of each employee, consultant, or agent who provided such information.

e. If you do not know the exact answer to any of the requests below, please so indicate and provide your best estimate.

f. Provide data in its original format (i.e., PDF, Excel, GIS shapefile, etc.), unless otherwise specified in the request.

g. Send your response to Simone Brant (simone.brant@energysafety.ca.gov), and include a copy to:

   kristin.ralffdouglas@energysafety.ca.gov, Jeanne.mckinney@energysafety.ca.gov, electricalundergroundingplans@energysafety.ca.gov.

h. E-file a copy of the response on the Electrical Undergrounding Docket #2023-UPs.

REQUEST

Q01. 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).

Q02. 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?

[1] 2024 PG&E's Comments on Draft Guidelines page 21

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:

Field Name	Description	Unit/Datatype
Total Circuit Segment Miles	Length of isolatable circuit segment before mitigation	Miles
Total Constructed Miles	Number of miles of new infrastructure to be energized	Miles
Total Miles Undergrounded	Number of miles of underground infrastructure to be energized	Miles
Overhead Removed	Number of miles of overhead line deenergized upon completion	Miles
Covered Conductor Installed	Number of miles of covered conductor to be installed	Miles
Other Mitigations	Provide brief description of other mitigation efforts or devices installed that are associated with this project	Text
Justification for Alternate Mitigation	Provide brief description for each "hybrid" project including the reason undergrounding was not used on the entire circuit segment and why the alternate mitigations were chosen (e.g. better cost/risk performance, physical limitations, or any other reasons).	Text
Other Mitigations Miles	Add a field for each alternate mitigation to be used and indicate the number of miles of overhead line it will be applied to or replace	Miles
Total Un-Mitigated Circuit-Miles on Circuit Segment	Number of miles of original, un-mitigated, circuit segment line after completion of project	Miles

Subprojects	Number of total subprojects created within this Project.	Integer
Underground Subprojects	Number of undergrounding subprojects	Integer
Covered Conductor Subprojects	Number of covered conductor subprojects	Integer
Other Mitigation Subprojects	Add a field for each alternate mitigation to be used and indicate the number of subprojects associated with it	Integer
Secondary Lines	Will secondary distribution lines be undergrounded as part of this project?	Boolean
Service Lines	Will service lines be undergrounded as part of this project?	Boolean
EPSS	Will EPSS be added to this circuit segment?	Boolean

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.

Q03. Please provide information requested as it pertains to PG&E-designated 'subprojects.'

a. Based on PG&E's definition of "subproject" from their November 3rd, 2023 response to Energy Safety's Request for Comments and Proposals Regarding SB 884, a given project can be broken into various subprojects, usually "[w]hen projects are scoped and planned for near-term completion (e.g., within 3 – 4 years)"[2]. For the purposes of this program, is there a requirement that every subproject consists of line undergrounding or an alternate mitigation? Is it possible that a subproject would only include line maintenance, equipment replacement, or other line improvements that may not, by themselves, be considered a wildfire mitigation alternative?
b. Would all undergrounding work within a project, one isolatable circuit segment, be consolidated into a single subproject, or could there be multiple undergrounding subprojects within a single circuit segment?
c. Would a subproject always consist of one contiguous line segment, or could a subproject include multiple, disconnected sections? For example, could one subproject consist of covered conductor installation on miles 2-3, and miles 6-7 of a circuit segment?
d. In a "hybrid project," which has a continuous section to be undergrounded, would it be likely (or even possible) that this continuous undergrounded section would be broken into subproject(s)? If so, is there a minimum or maximum length of the subproject?
e. In a "hybrid project," which has discontinuous sections to be undergrounded, would each of the discontinuous undergrounded portions always be recorded as a separate subproject?

[2] 2023 PG&E's Response to Energy Safety Request for Comment and Proposals Regarding SB 884 10 Year Plan Guidelines page 6

f. Would there be cases where "hybrid subprojects" would be created? For example, could one subproject have 4 miles of undergrounding and 1 mile of covered conductor on a 10-mile circuit? Alternatively, would this hypothetical project be split into multiple subprojects based on mitigation type?
g. Provide details on how risk apportioning is handled for a project with multiple mitigation types. Is the apportionment assigned before or after normalization? Does PG&E combine the risk reduction and reliability improvements for each mitigation separately from each other? Can PG&E provide normalized values per mile for each mitigation before blending into overall circuit segment values?
h. Does PG&E anticipate any problems with reporting the subprojects with respect to the Cost-Benefit Analysis defined through CPUC proceeding R.20-07-013?
i. In PG&E's February 13th, 2024, response to Energy Safety's Data Request, the following clarification was given, "Projects and circuit segments. We define projects at the circuit segment level, while a subproject is a job that breaks out the project into phases. Therefore, based on how they are defined, projects are associated with a single circuit segment. Most jobs (sub-projects) fall within a single circuit segment. However, occasionally, jobs may include assets on multiple circuit segments, due to line relocation. In most cases, a job that includes assets on multiple circuit segments will fall into continuous circuit segments. There may be rare exceptions where circuit segments are not continuous, but are geographically near each other — for example, in the case of a double circuit."[3]
    i1 Please provide full detail on the circumstances under which "a job [subproject] that includes assets on multiple circuit segments will fall into continuous circuit segments." Provide an example with illustration.
    i2 How does PG&E propose to account for a subproject that covers multiple circuit segments, and how will it be analyzed and recorded within their EUP?
j. In PG&E's May 29th, 2024, comments on the Energy Safety draft guidelines, PG&E proposes that "[f]or circuit segments where less than 80 percent of the circuit segment has been identified for undergrounding, the sub-projects will be segregated with the undergrounding sub-project presented in the EUP and non-undergrounding portions captured in a different regulatory process (e.g. the utility's GRC)."

[3] 2024 PG&E Ref. DRU13015 Data Request OEIS page 3

j1 For circuit segments with 80% or more underground work, how would the underground and non-underground work be divided into subprojects?
j2 For circuit segments with less than 80% underground work, if subprojects are not identified until screen 3, how would the non-undergrounded portion of the project be presented in the EUP before screen 3?

Q04. Please provide information requested as it pertains to PG&E-designated 'Remote Grids.'

a. Provide PG&E's definition of remote grid and confirm how this is distinct from "microgrid." What technologies are primarily used?
b. Confirm that remote grids will have no connection, backup or otherwise, to PG&E's distribution system, and that every mile of overhead distribution line "replaced" by the remote grid will be removed.
c. How many remote grids does PG&E intend to deploy over the next 10 years? How many have already been deployed?
d. What has been the source of funding for the remote grids already deployed?
e. What is the average length of distribution line that is expected to be removed for each remote grid?
f. What are the average and median number of customers, and load size, that will be served by each remote grid?

Q05. Please provide information requested as it pertains to PG&E project and subproject IDs.

a. In PG&E's May 29th, 2024, comments on draft guidelines, PG&E states that "PG&E's grid is dynamic. Circuit segments and/or circuit protection zones change regularly and therefore there are not static circuit protection zones."[4] Given that these isolatable circuit segments change over time:
    a1 How does PG&E track project and subproject IDs?
    a2 How frequently is this information updated and how is it reported in Wildfire Mitigation Plan data submissions?
b. Suppose a circuit protection zone currently has an undergrounding project planned for development on it. If this circuit protection zone is modified, for

[4] 2024 PG&E's Comments on Draft Guidelines page 20

example by installation of a new device which splits it into multiple circuit protection zones, how does PG&E track the project which previously was slated for installation?

b1 Does the project become split into multiple new projects?

b2 Do the subprojects inside that circuit protection zone get renamed, redeveloped, reassigned, or otherwise changed?

b3 How would the above change if a circuit protection zone was modified in some other substantial way, e.g. by new construction, removal of a recloser, or substantial restructuring of the circuit protection zone?

c. Does completing an undergrounding project ever cause a change to the underlying circuit protection zone s, i.e. change the customers and/or general geographic area served by the isolatable circuit segment, either by splitting the circuit protection zone into multiple new circuit protection zone s or by otherwise changing the topology?

c1 If so, how frequently does this cause a change of this type, e.g. every time, most times, rarely, never? What factors affect the likelihood of this type of change?

c2 Do the answers to either of the questions in c1 change when we distinguish between fully undergrounding (100% UG), “hybrid” projects (>80% UG), and other projects (<80% UG)?

END OF REQUEST