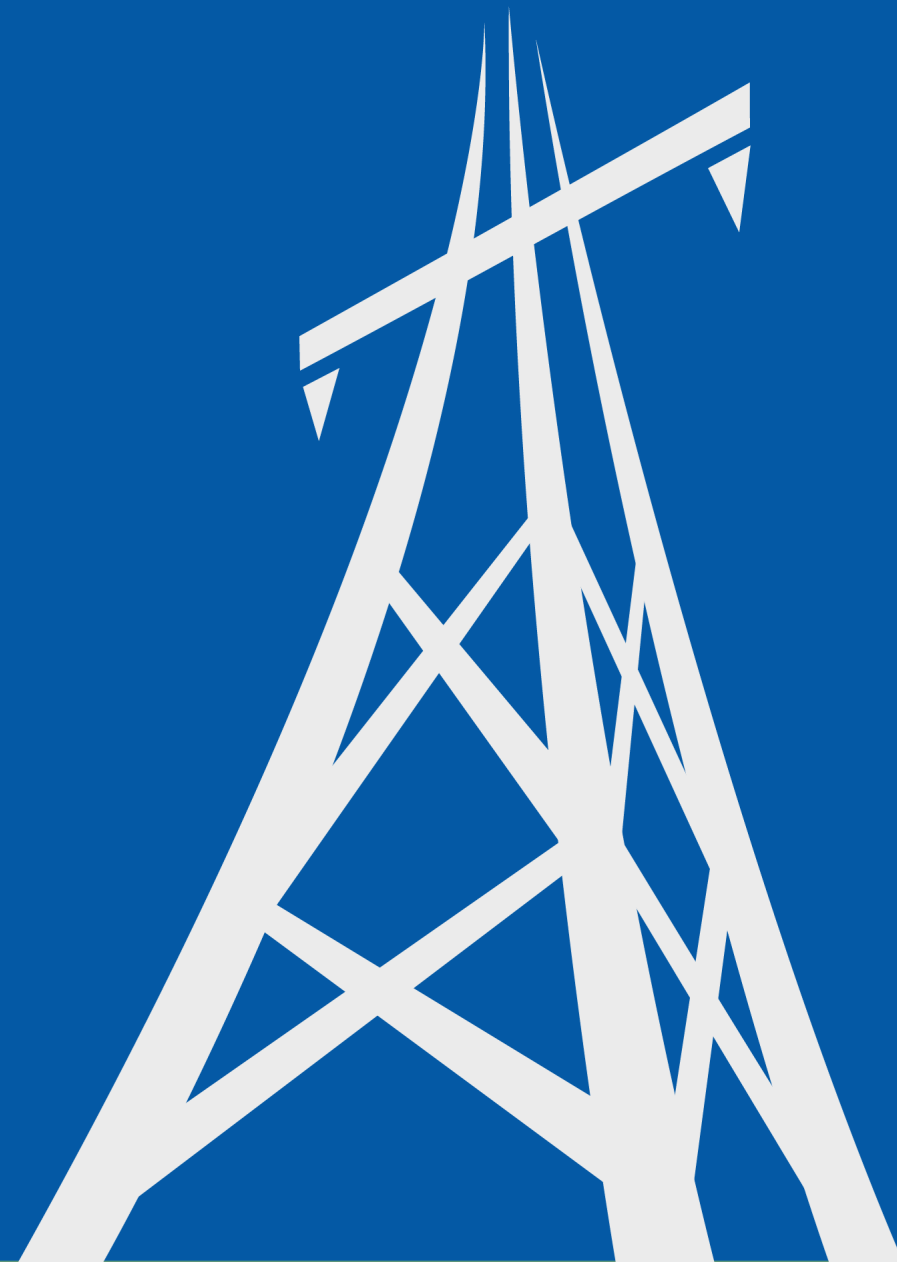
# Electrical Undergrounding Plan Guidelines

Public Workshop
Office of Energy Infrastructure Safety
Friday, January 17, 2025 – 10:00 am to 11:30 am



# Agenda

- Introduction and Safety Message
- Definitions
- Alternative Mitigation Comparisons
- HFTD Boundaries
- Wildfire Rebuild Areas
- Targets vs Tracking Objectives
- Screen 4 Cost-Benefit Ratio Refresh
- Physical, Model and Informational Updates
- Project Table Changes
- Template Availability

# Introduction & Safety Message

## Welcome to Energy Safety's Workshop on the Second Revised Draft of the 10-year Electrical Undergrounding Plan Guidelines

- ✓ Take care of your posture. Sit in a comfortable position
- ✓ Take precautions during extreme heat, stay hydrated
- ✓ Be prepared for earthquakes – duck, cover, and hold
- ✓ Be aware of your surroundings and know your evacuation route(s)
- ✓ Feel something say something and we will find a way to help

# Public Comment

If you wish to comment:


Press the “Raise Hand” button. Participants will be unmuted in order of hands raised.

Or

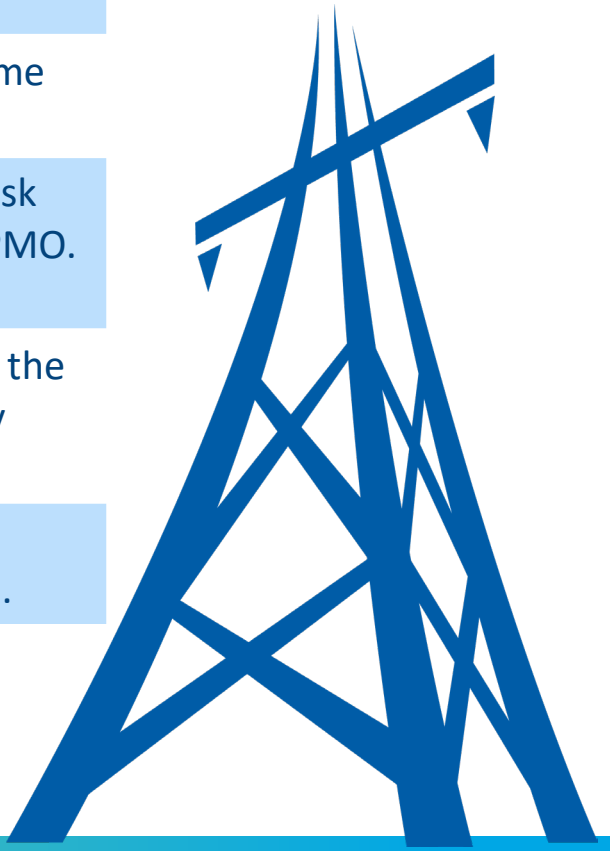

Open the "Q&A" panel, type your question in the text box, and click “Post”.

# Definitions

# DEFINITIONS

| Previous Term | New Term | Meaning |
|---|---|---|
| Circuit Protection Zone ("CPZ") | Circuit Segment | An isolatable Circuit Segment. ~~Unless otherwise indicated, "Circuit Segment" also refers to an isolatable Circuit Segment.~~ |
| - | Circuit | A combination of all Circuit Segments that are fed from the same substation circuit breaker. |
| Risk Reduction Project-Level Standard | High-Risk Project-Level Standard | The minimum decrease in Ignition Risk and Outage Program Risk that an Undergrounding Project must achieve to support the PMO. |
| Reliability Increase Project Standard | High Frequency Outage Program Project-Level Standard | The minimum decrease in Outage Program Likelihood through the KDMMs that any project considered under the High Frequency Outage Program must achieve. |
| Tail Risk Mitigation Project Standard | Tail Risk Project-Level Standard | The minimum decrease in wildfire likelihood that any project considered under the Ignition Tail Risk Threshold must achieve. |
| Threshold Level | Project-Level Thresholds | The High-Risk Threshold, Ignition Tail Risk Threshold, & High Frequency Outage Program Threshold. |

Clarification: Mitigated Risk Threshold will be replaced with the term "Mitigated Circuit Segment Standards"



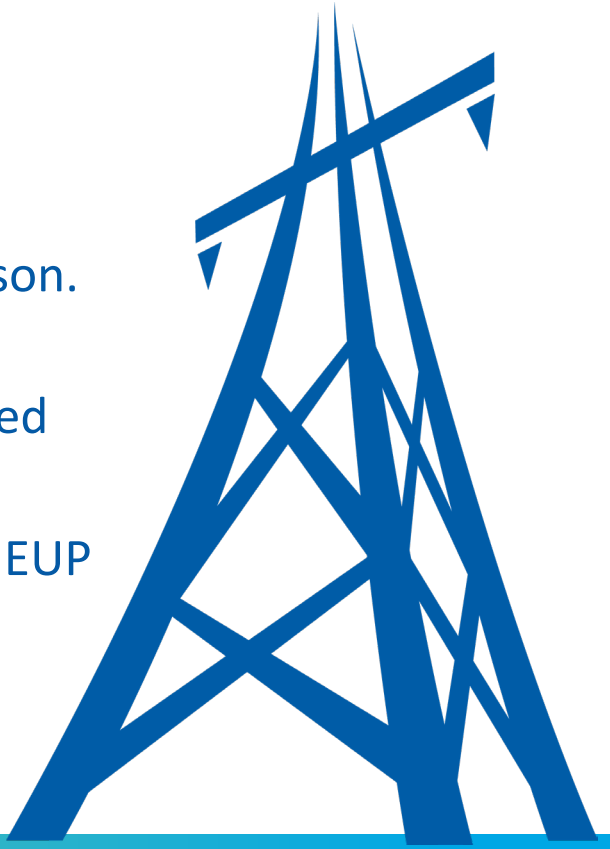
# Alternative Mitigation Comparisons

# ALTERNATIVE MITIGATIONS

**Issue:** To improve the effectiveness of the Alternative Mitigation Comparison Analysis in the Second Revised Draft Guidelines, the following changes have been made.

**Language Changes:**

- Clarifying language and more detailed directions have been added to the Alternative Mitigation Comparison requirements.
- Changes have been made to the required design variations used in the comparison.
  - 100% Undergrounded design variation removed from Screen 3.
  - Screen 3 will now compare one combination of Alternative Mitigations derived from Screen 2 and detailed project scoping.
- Additional narrative requirements on mitigation choice have been added to the EUP and Progress Reports.



# ALTERNATIVE MITIGATION ANALYSIS

| | Comparative Metrics | Design Variations | Alternative Mitigation Details |
|---|---|---|---|
| **Screen 2** | • Risk Reduction<br>• CBR<br>• Total Cost<br>• Benefits:<br>(Safety, reliability, financial) | • 100% Undergrounded<br>• **Alternative Mitigation 1**<br>• **Alternative Mitigation 2** | **Alternative Mitigation 1:**<br>• Aboveground Hardening<br>• Covered Conductor<br>• Protective Equipment and Device Settings<br><br>**Alternative Mitigation 2:**<br>• At least one different or additional mitigation*<br>• Meet or exceed Alt. Mitigation 1 |
| **Screen 3** | Detailed Risk Analysis Using KDMM Data:<br>• Separate/Collective/Ablation<br>• Instantaneous/Cumulative<br>• 0-55 years | • ~~100% Undergrounded~~<br>• Project as Scoped<br>• Undergrounding as Scoped<br>• Baseline<br>• **Screen 3 Alternative Mitigations** | **Screen 3 Alternative Mitigations:**<br>• Aboveground Hardening<br>• Covered Conductor<br>• Protective Equipment and Device Settings<br>• Any additional mitigations derived from project scoping and Screen 2 comparison |
| **Screen 4** | • Risk Reduction<br>• CBR<br>• Total Cost<br>• Benefits:<br>(Safety, reliability, financial) | • Project as Scoped<br>• Undergrounding as Scoped<br>• **Screen 3 Alternative Mitigations** | **Screen 3 Alternative Mitigations:**<br>• Same as above |

# HFTD Boundaries

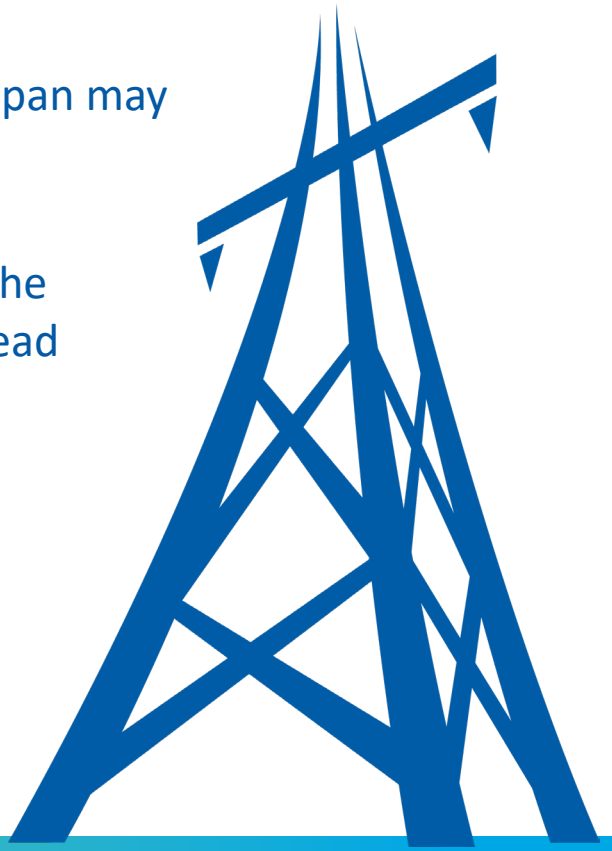
# HFTD BOUNDARIES

**Issue:** In comments submitted on October 3, 2024, PG&E noted that the Guidelines did not address scenarios when Circuit Segments cross High Fire-Threat District boundaries.

**PG&E Proposed Solution:** For spans that cross High Fire-Threat District boundaries, the entire span may be considered for undergrounding in the EUP.

**Energy Safety Position:** Provide some flexibility for Large Electrical Corporations to capture all the risk at the High Fire-Threat District boundary and prevent scenarios where transitions to overhead lines at exactly the boundary is impractical.

**Language Changes:** *Section 2.4.3.1* "If a Circuit Segment has portions both within and outside of a Tier 2 or 3 HFTD, each span crossing the Tier 2 or 3 HFTD boundary and up to two adjacent spans outside of a Tier 2 or 3 HFTD may be considered for undergrounding."



# Wildfire Rebuild Areas

# WILDFIRE REBUILD AREAS

**Issue:** In comments submitted on October 3, 2024, the Public Advocates Office stated that the revised Guidelines allow Circuit Segments in Wildfire Rebuild Areas to pass Screen 1 without meeting the Project Level Thresholds. They argued that this does not follow the Project Acceptance Framework as required by Public Utilities Code section 8388.5(c) and conflicts with the statutory requirements of SB 884. In reply comments submitted on October 14, 2024, PG&E disagreed with the Public Advocates Office and voiced support for Section 2.3.5. PG&E argued that the language still requires Circuit Segments in Wildfire Rebuild Areas to progress though Screens 2 and 3 and is therefore fully consistent with the statutory mandate.

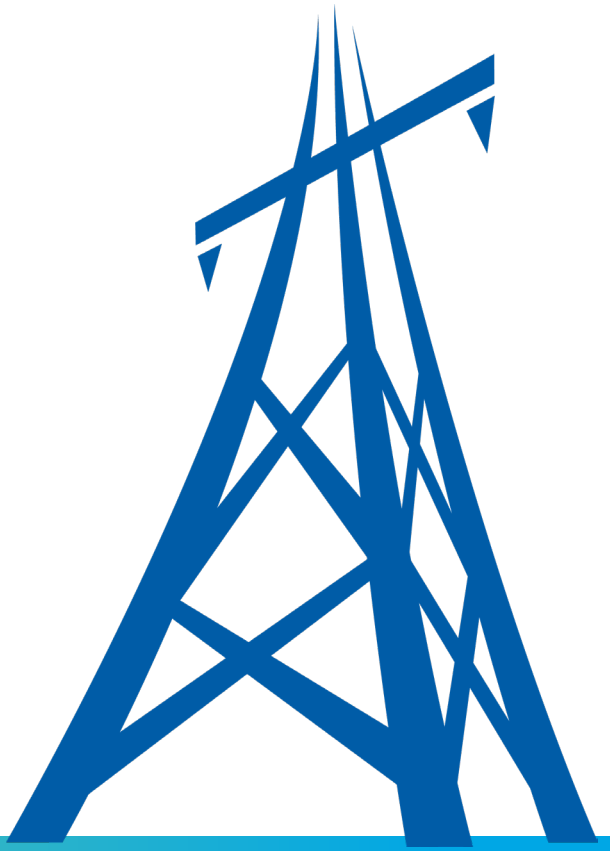
**Energy Safety Position:** Revised language to align eligibility requirements for Circuit Segments in Wildfire Rebuild Areas and in High Fire-Threat Districts. Wildfire Rebuild Area Circuit Segments must meet the same Project-Level Thresholds and count towards the Plan Mitigation Objective.

# WILDFIRE REBUILD AREAS

**Language Changes**:

- Section 2.3.5: Revised language for Risk Calculations for Projects in Wildfire Rebuild Areas to state that Pre-Wildfire risk scores are used for Project-Level Thresholds, Screen 3 comparisons, and risk reduction for determining progress towards the Plan Mitigation Objective and Plan Tracking Objectives.

- Section 2.4.3.2: Circuit Segment Risk Reduction Levels: Removed language stating, “Circuit Segments in Wildfire Rebuild Areas that do not meet these thresholds must provide justification to be designated as Eligible Circuit Segments as described in Section 2.3.5.”



# Targets vs Tracking Objectives

# TARGETS VS TRACKING OBJECTIVES

**Issue**: In comments submitted on October 3, 2024, PG&E noted that in the Plan Tracking Objectives (Section 2.3.2), it states: “the Independent Monitor will use the Plan Tracking Objectives to assess the Large Electrical Corporation's compliance with its EUP.”

This language led to confusion about whether these metrics were progress-tracking tools for the plan's implementation or compliance targets.

**Energy Safety**: These objectives will be used for tracking the Large Electrical Corporation's progress in implementing their EUP.

Metrics used for EUP compliance will be further detailed in Energy Safety’s Compliance Guidelines.

# TARGETS VS TRACKING OBJECTIVES

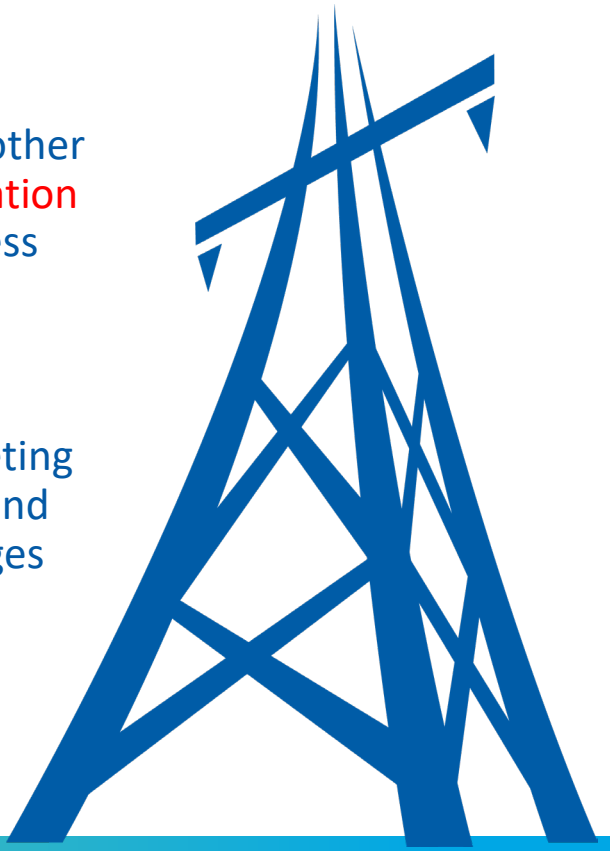
**Changes** (*Section 2.3.2)*

**Removed:**
The term "target"

**Modified:**
"The Independent Monitor will use the ~~Plan Mitigation Objective,~~ Plan Tracking Objectives, and other EUP objectives to assess the Large Electrical Corporation's ~~compliance~~ progress with implementation of its EUP. The ~~Plan Mitigation Objective and~~ Plan Tracking Objectives will be tracked in all Progress Reports pursuant to sections 8388.5(f)(3) and 8388.5(g)."

**Added:**
"The Plan Tracking Objectives are the Large Electrical Corporation's current forecast plan for meeting the Plan Mitigation Objective. Each Progress Report must use performance metrics to compare and update the Plan Tracking Objectives. The Progress Report must explain the reasons for any changes to the Plan Tracking Objectives.

The EUP must contain a narrative setting forth the process the Large Electrical Corporation will use to compare and update Plan Tracking Objectives in each Progress Report."



# Screen 4 Cost-Benefit Ratio Refresh

# SCREEN 4 COST-BENEFIT RATIO REFRESH

**Issue**: The Draft Guidelines required a Large Electrical Corporation to return to Screen 2 and update the CPUC Cost-Benefit Ratio information after completing the project scoping in Screen 3. This workflow was inefficient and not well aligned with CPUC processes.

**Changes in the Second Revised Draft Guidelines:**

- Moved the CBR information update to Screen 4 *(Section 2.4.6).*

  In Screen 4 "the costs, benefits, and CPUC CBR are calculated for the design variations that were used in Screen 3, including the Screen 3 Alternative Mitigations, the Project as Scoped and the Undergrounding as Scoped."

- Added an additional data submission: C.1.13 Screen 4 Table which stores all updated CBR information for projects that pass Screen 4.

# Physical, Model and Informational Updates

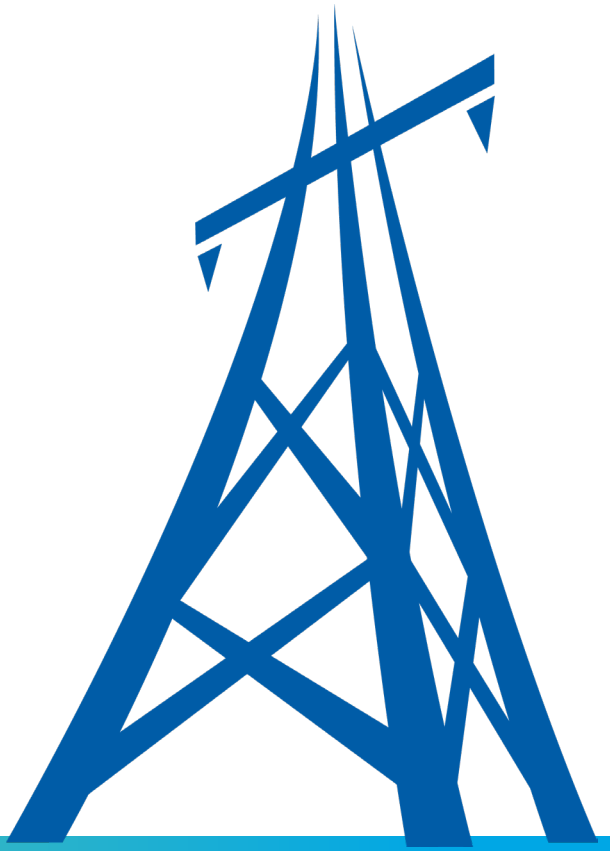
# DATA FRESHNESS AND MODEL UPDATES

**Issue**: In comments submitted on October 3, 2024 PG&E noted : “PG&E’s current ignition risk model (Wildfire Distribution Risk Model, Version 4 or WDRM v4) is based on PG&E’s electric grid as it was configured on January 1, 2023. All decisions to harden a circuit segment will be made based on this configuration for as long as PG&E uses WDRM v4. When PG&E updates its ignition risk model it will be based on the grid as it is configured some date in the future…”

**Resolution:** Energy Safety recognizes that operational decision-making should be tied to established processes at their statutory cadences, but also understands that Large Electrical Corporation risk analysis as well as Energy Safety’s oversight need to be conducted as a persistent effort.

**Changes in the Second Revised Draft Guidelines:**

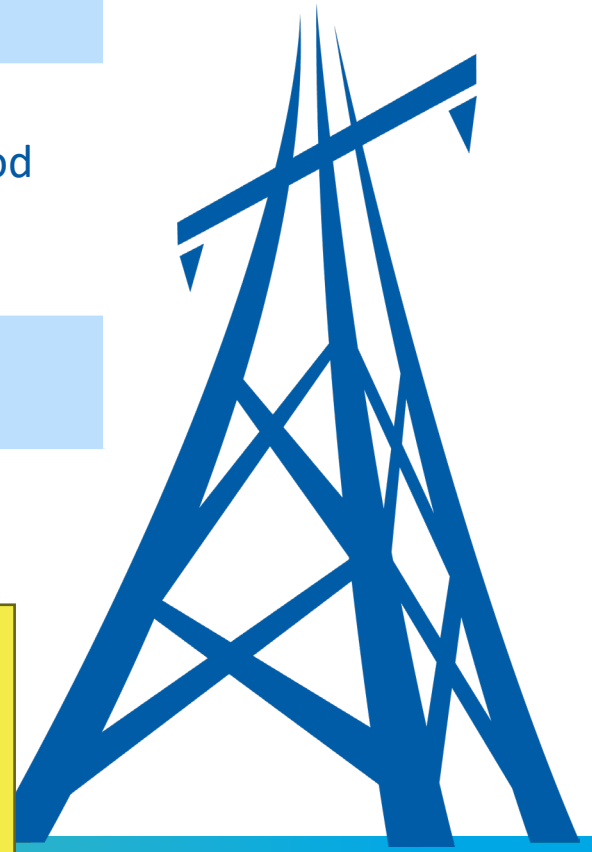
- **Section 2.7.5 Core Capability 6: Establishing Baselines and Historical Calibrations**
- **Section 2.7.6 Baselines, Backtesting, Model Retention, and Subsequent Model Reports**



# 3 TYPES OF CHANGES/UPDATES

| | Physical Update to Distribution System* | Data Set Improvement | Methodological Change |
|---|---|---|---|
| **Defined as:** | N/A | **Calibration Update** | **Version Update** |
| **Example:** | 1. Addition/Removal of recloser in HFTD<br>2. Creation of new circuit | A larger dataset is used to compute Ignition Likelihood (ex: ignition records from 2024) | A new formula is used to compute Ignition Likelihood |
| **Reporting Cadence:** | Annually, aligned with WMP QDR submission | In Progress Report after change is operationalized | In Progress Report after change is operationalized |
| **Triggers:** | **New risk numbers for existing equipment. May be based on prior modeling rather than entirely new analysis. Update line feature class.** | New Baseline | New Model Report, New Baseline, Backtesting |

**New language added in response to comments/reply from **PG&E** on the Revised Draft Guidelines, concerning reporting cadence, and anticipated model update schedules*



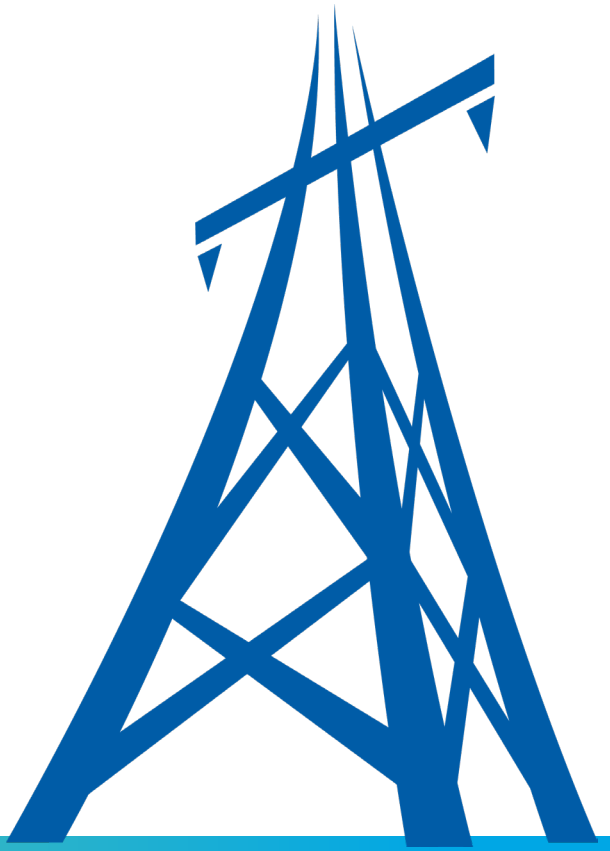
# CORE CAPABILITY 6 (2.7.5)

**Modified**:

"The Large Electrical Corporation must demonstrate how it ensures that the Risk Modeling Methodology is evaluated with up-to-date information that accurately reflects the Large Electrical Corporation's understanding of the risk on the system."

**Added:**

"To do this, the Large Electrical Corporation must develop a system to record Baselines and historical model calibrations. **A new Baseline must be recorded by the Large Electrical Corporation at least once per calendar year.** This new Baseline must account for all physical changes to the electrical distribution infrastructure performed during that year, through the EUP or any other mechanism."

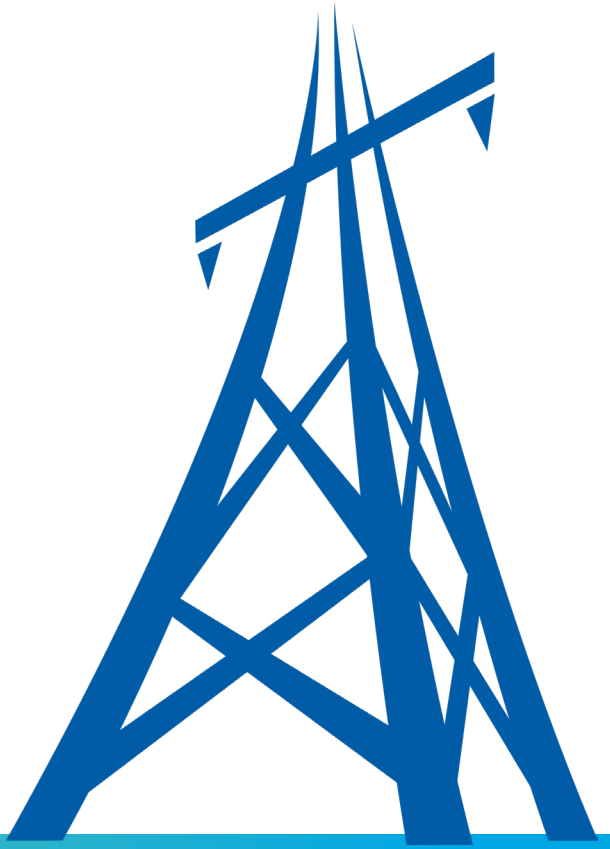


# BASELINES (SECTION 2.7.6)

**Issue**: The change of language in Section 2.7.5 uncoupling reporting of physical updates and risk modeling/decision-making updates added ambiguity as to when/how baselines should be computed.

**Changes in the Second Revised Draft Guidelines:**

"In each Model Report, including in Progress Report 0 and subsequent Progress Reports, the Large Electrical Corporation must establish a new Baseline which reflects the existing distribution system as detailed in Section 2.7.5 of these Guidelines…Risk scores for new equipment/alignment must be reported in the same granularity, scale and methodology as previously existing equipment. These evaluations must be conducted in accordance with the Large Electrical Corporation's Risk Modeling Methodology, as described in the EUP, in cases where the Large Electrical corporation has not re-evaluated the risk on the new equipment."



# Data Reporting Requirements

# CHANGES IN DATA SUBMISSION

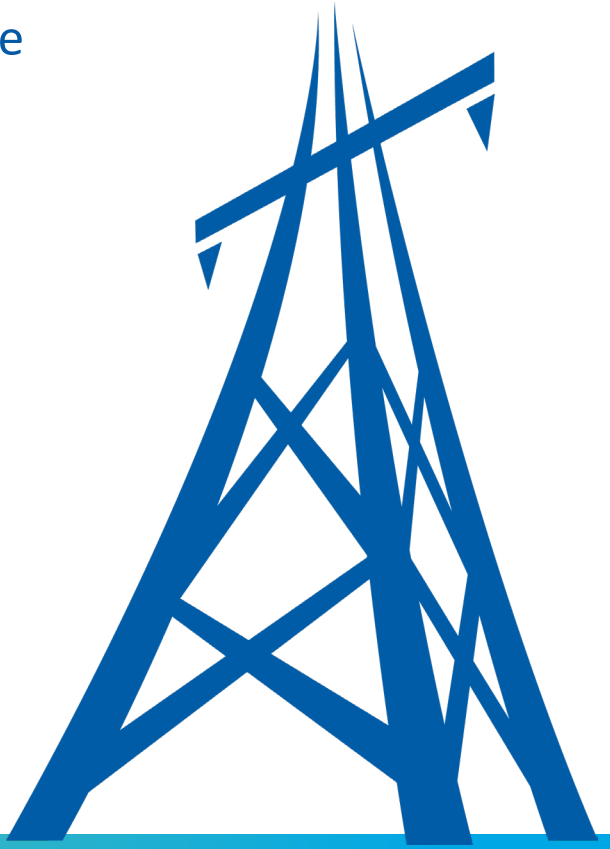
- Tabular Data
- JSON Data submission
- Spatial Data

NOTE: data submission template/example files have now been posted to Energy Safety's website: Electrical Undergrounding Division

# TABULAR DATA

## Changes in Content:

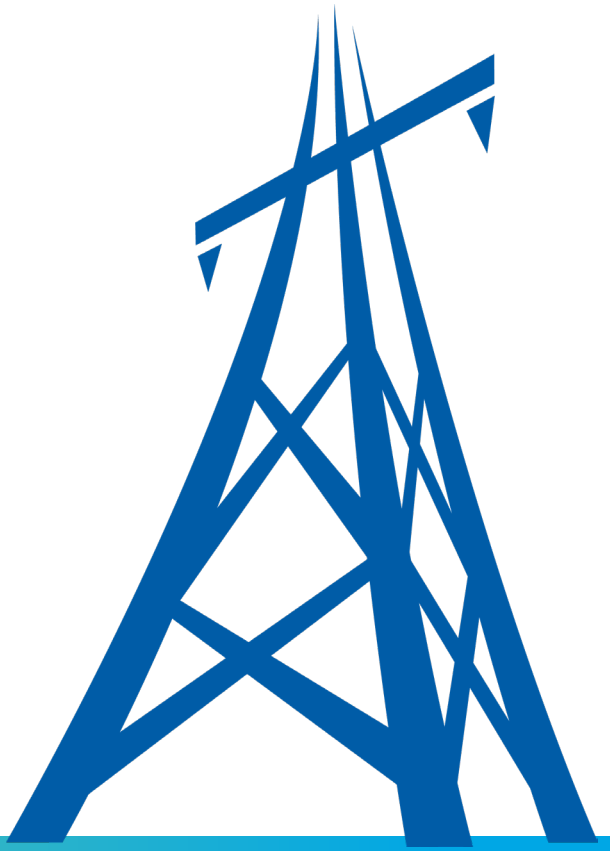
- Table 8 Risk Scores now includes all 7 required KDMMs, not just the threshold values. These are updated with each “Physical Update” via an estimation to be provided by the Large Electrical Corporation.
- Removed direct tracking of non-EUP projects outside of HFTD or Wildfire Rebuild areas.
  - In response to PG&E comments on Revised Draft, 10/3/24, Sec. 11
- Moved “Order Number” tracking for linkage with CPUC reporting from the Project Table *(Table 10)* to the Subproject Table *(Table 14).*
  - In response to PG&E comments on Revised Draft, 10/3/24, Sec. 6



# TABULAR DATA

## Clarifying Edits:

- Table 8, Circuit Segment Risk Score Table, requires a risk evaluation for all Circuit Segments, regardless of whether they are considered Undergrounding Projects or they are eligible for the EUP.
- Added “Wildfire Rebuild” as a category for Circuit Segment eligibility in Tables 6, 10, and 15.



# TABULAR DATA

## Updates to match other Guidelines changes

### Screen 4 CBR Update:

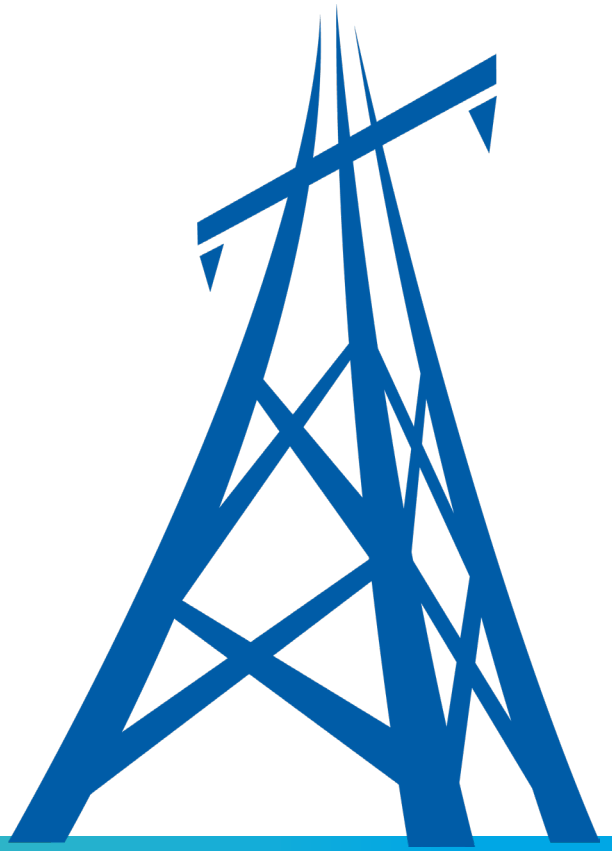
- Added "Screen 4 Table" *(Table 13).* This is effectively the same as the Screen 2 Table, however it tracks different mitigations *(see below)* and is expected to be kept up to date as the project is scoped and constructed, not simply estimated at one particular phase.
- Removed requirements to "update" the Screen 2 Table *(Table 11)* after project becomes Confirmed Project, as well as "project as scoped" and "undergrounding as scoped," which are now tracked in the Screen 4 Table.

### Alternative Mitigation Changes:

- Changed list of required alternatives in Screen 3 Table *(Table 12)* to account for only one alternative being required for detailed modeling.
- Added field "Alternative Mitigation Justification" to Screen 3 Table for explanation of the construction of this detailed "Screen 3 alternative."

### Project Index Table:

- Restructured Project Index Table *(Table 15)* to account for changes to alternatives and Screen 4 CBR update.



# JSON DATA

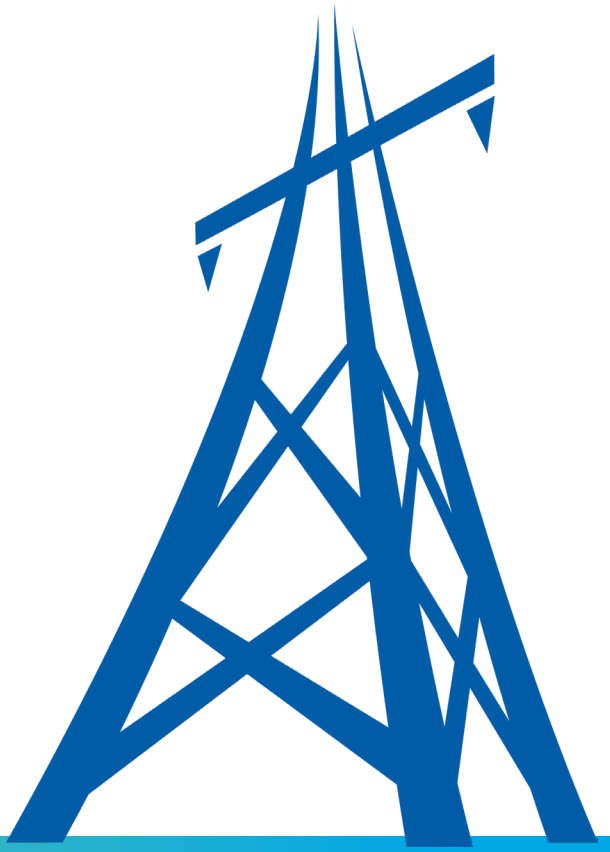
## Updates to match other Guidelines changes

### Modeling Requirements:

Changed years in JSON 2 *(Model Risk Landscape)* to clarify projection of risk into the future includes estimating instantaneous and accumulated risks at 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 15, 20, 25, 30, 35, 40, 45, 50, and 55 years.

### Alternative Comparisons:

Changed required alternatives in JSON 2 *(Model Risk Landscape)* to match required alternative comparisons in Screen 3.



# SPATIAL DATA

## Clarifying Edits:

Alignment IDs: In the pre- and post- mitigation proposal, use of alignment IDs had their names changed to match between T14 and C.4.3-6, and was clarified to refer to any change in planned installation location, but not improved length estimates.

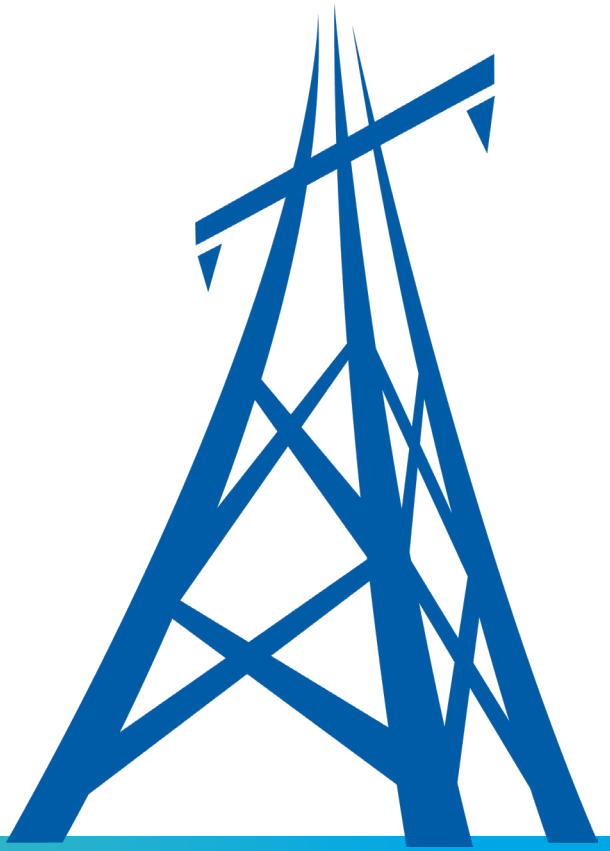
Correction: Subproject IDs are created in T14 (Subproject Table) as an NVARCHAR(255). In C.4.3-6, the matching Subproject ID asked for INT will be replaced with NVARCHAR(255) to match T14.

## Changes in Content:

Flexibility on submission: Alternative submissions (e.g. KMZ) possible on initial submission, with proposal to move to GDB over the course of the EUP.

## Updates to match other Guidelines changes:

Modeling Requirements: Circuit segment layer to be updated with "Physical Update."

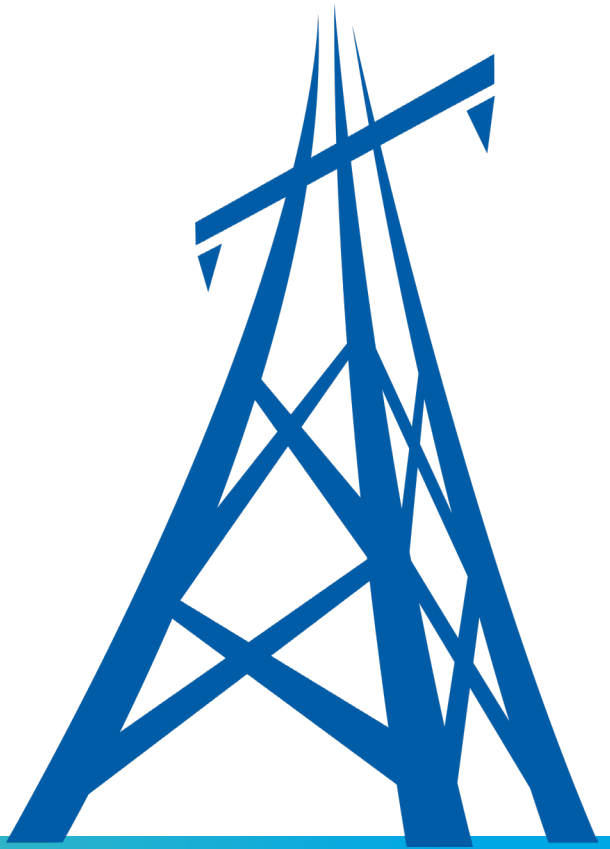


# NEXT STEPS

- Comments on the edits to the Second Revised Draft Guidelines are due on January 27, 2025 and reply comments are due on February 7, 2025.

- Energy Safety has provided both a redlined version and a clean version for review on its website.

Thank you for your participation today!



# DATA DRIVEN
# FORWARD-THINKING
# INNOVATIVE
# SAFETY FOCUSED

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# Key Decision Making Metrics and Risk Scaling

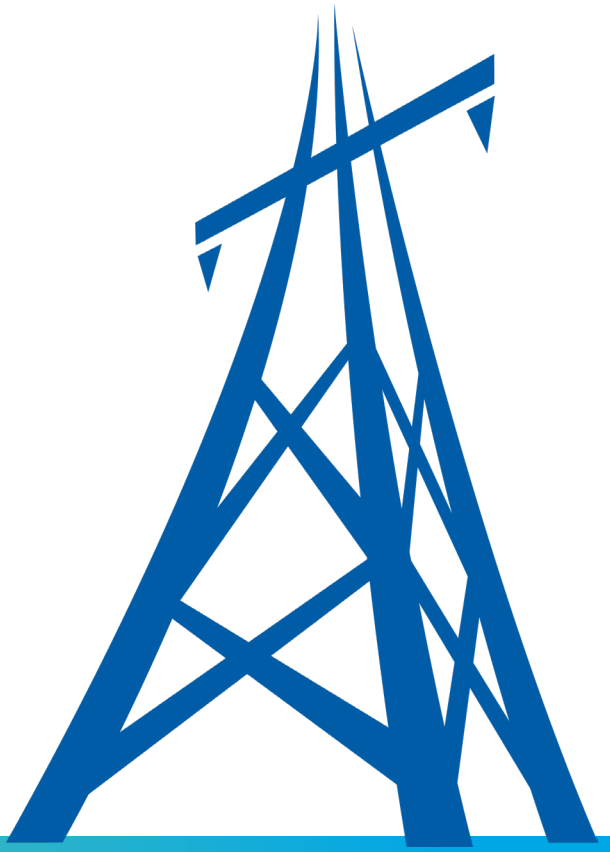
# KDMMS

**Issue**: Comments submitted by several parties asked for clarification around finalization and risk attitude scaling.

**Resolution**: The goal of separating screen 1/3 KDMMs and screen 2/4 CBA metrics is to separate probabilistic risk analysis from decision-science. Each set of metrics are important for understanding different aspects of an Undergrounding Plan.

**Clarifying Edits in the Second Revised Draft Guidelines:**

**(2.7.3)** The Key Decision-Making Metrics (KDMMs) are defined to be the collection of top-level metrics that the Large Electrical Corporation proposes to use to evaluate the efficacy of an Undergrounding Project. These KDMMs are not influenced by risk attitudes, risk tolerances, opportunity costs or any other decision-making parameters. They do not reflect financial considerations and must be used alongside financialized metrics reported in Screen 2 and Screen 4 to evaluate projects. The KDMMs measure key elements of risk and can be substantiated by real-world observations.



# PRIORITIZATION SCHEME & LEVEL

- **Issue**: In Table C.13 Screen 4 Table, the Guidelines require the Large Electric Utility to provide a “project_priority” that is defined as the “prioritization level of the Undergrounding Project, according to the prioritization scheme defined in the EUP.” PG&E requested clarification prioritization scheme & prioritization level.

- **Resolution**: In Section 2.4.6 Screen 4: Project Prioritization and Finalization, it states that:

  "the EUP must describe how the factors will be applied to set priority for Confirmed Projects. The EUP must describe how the prioritization aligns with and supports the Plan Mitigation Objective. The EUP must include a narrative of the Large Electrical Corporation’s rationale and supporting data (e.g., KDMMs) for each definition and the means of prioritization included in Screen 4."

- ***Prioritization scheme*** – the method by which the Large Electrical Corporation prioritizes Confirmed Projects.
- ***Prioritization level*** – the hierarchy that is the result of the Large Electrical Corporation's prioritization scheme