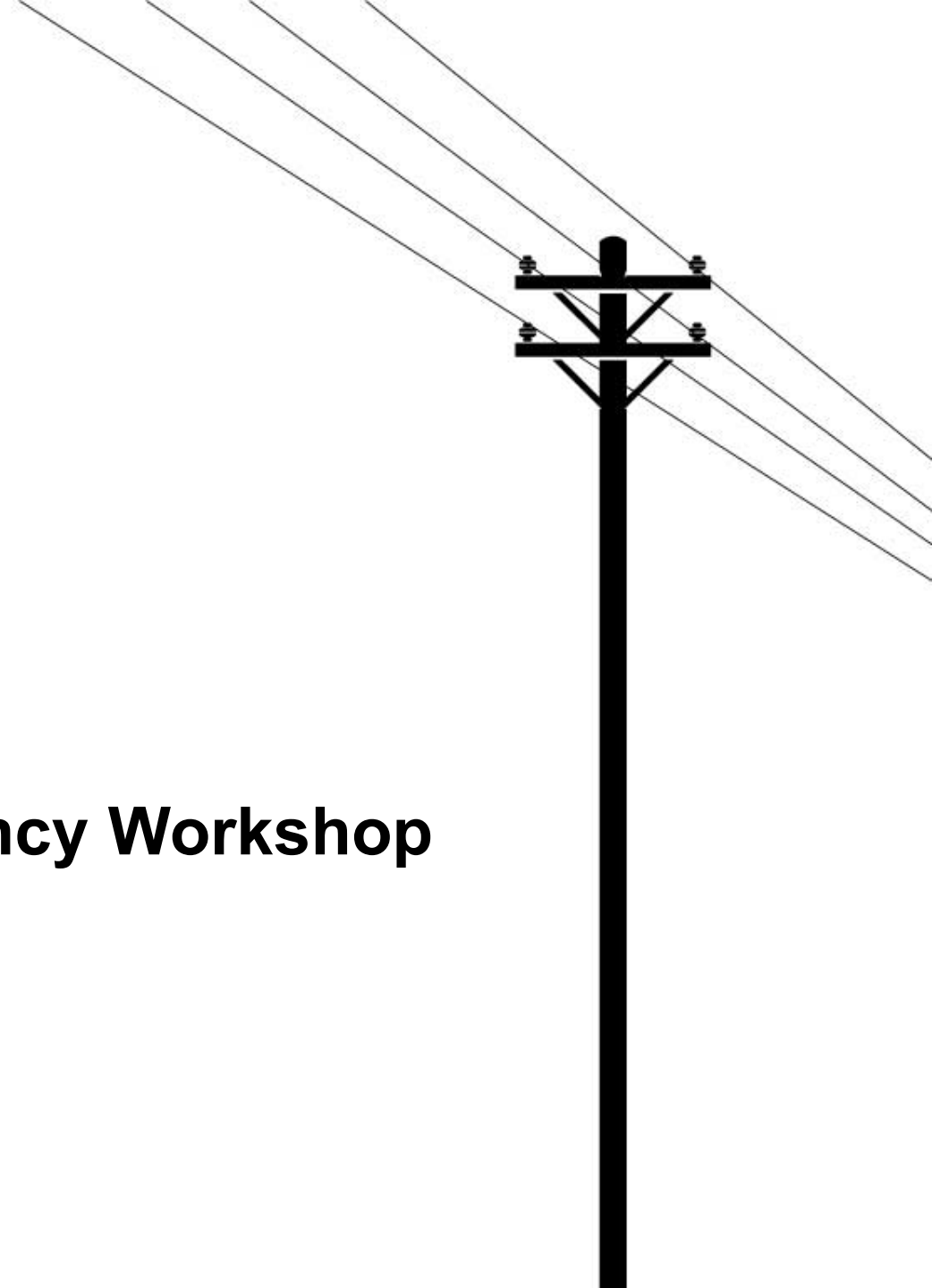


SDGE™

& WILDFIRE SAFETY

# OEIS Risk Spend Efficiency Workshop

December 9, 2021

# Agenda

1. RSE Calculation Methodology
2. RSE Estimate Verification Process
3. RSE Estimate and Initiative-Selection Process
4. Comprehensive Spreadsheet

# What is Risk Spend Efficiency (RSE)?

*RSE is a calculation of the cost effectiveness of a mitigation. Similar to a cost/benefit analysis using risk points; also known as "risk reduction per dollar spent"*

$$RSE = \frac{\text{Risk Reduction} \times \text{Lifetime of Benefit}}{\text{Total Cost}}$$

Risk Reduction = (Pre-Mitigation LoRE – Post-Mitigation LoRE)* CoRE
Lifetime of Benefit = Net Present Value risk reduction adjustment factor
Total Cost = Forecast Cost of the Mitigation

**Balancing Risk Reduction and Costs**

# RSE Calculation Methodology Overview

## Step by Step Process:

1. Baseline risk score calculation
2. Risk reduction calculation
3. Net present value (Lifetime of Benefit) risk reduction calculation
4. Total cost calculation
5. $$RSE = \frac{\text{Risk Reduction} \times \text{Lifetime of Benefit}}{\text{Total Cost}}$$

| | | | | Underground | | | Covered Conductor | | |
|---|---|---|---|---|---|---|---|---|---|
| **Segment** | **WF Risk** | **PSPS Risk** | **Total Risk** | **Total Risk Reduction** | **Total Cost** | **RSE** | **Total Risk Reduction** | **Total Cost** | **RSE** |
| Segment 1 | 15 | 5 | 20 | 18 | $15M | 55 | 10 | $7M | 85 |
| Segment 2 | 23 | 15 | 38 | 30 | $30M | 45 | 15 | $12M | 60 |
| …… | … | … | … | … | … | … | … | … | … |
| Segment n | 10 | 8 | 18 | 16 | $10M | 60 | 5 | $5M | 35 |

*Illustrative segment-mitigation table*

# Risk Score Calculation

$$RSE = \frac{\text{Risk Reduction} \times \text{Lifetime of Benefit}}{\text{Total Cost}}$$

Risk Score = Likelihood of Risk Event (LoRE) × Consequence of Risk Event (CoRE)

## System Risk Score

$$= \sum_{i=1}^{n} \sum_{j=1}^{4} (Pre\_Mit\ LoRE_i * Pre\_Mit\ CoRE_{ij})$$

$n$ = number of system risk elements considered (e.g. WF risk, PSPS risk, etc.),

$i$ = ranges through the system risk elements assessed

$j$ = ranges through the 4 attributes of the MAVF framework (safety, financial, reliability, and stakeholder satisfaction)

Example: WF Risk

$$\sum_{i=1}^{4} (Pre\_Mit\ LoRE_i * Pre\_Mit\ CoRE_{ij})$$

LoRE

CoRE

$$(2.71) \times (0.02 + 0.10 + 0.03 + 0.01)$$

Safety score

Reliability score

Financial score

Stakeholder score

=

**Total Wildfire Risk**

0.433

*Illustrative*

# Risk Score Reduction Value Determination

$$RSE = \frac{\text{Risk Reduction} \times \text{Lifetime of Benefit}}{\text{Total Cost}}$$

$$= \sum_{i=1}^{n} \sum_{j=1}^{4} ((Pre\_Mit\ LoRE_i * Pre\_Mit\ CoRE_{ij}) - (Post\_Mit\ LoRE_i * Post\_Mit\ CoRE_{ij}))$$

Example: WF Risk Reduction for Covered Conductor (CC)

$$\sum_{j=1}^{4} (((Pre\_Mit\ LoRE_1) - (Post\_Mit\ LoRE_1)) * CoRE_{1j})$$

LoRE (Pre-CC) LoRE (Post-CC) CoRE

$$(2.71 - .948) \times (0.02 + 0.10 + 0.03 + 0.01)$$

Safety score Financial score Reliability score Stakeholder score

$=$

**Total Wildfire Risk Reduction**

.282

*Illustrative*

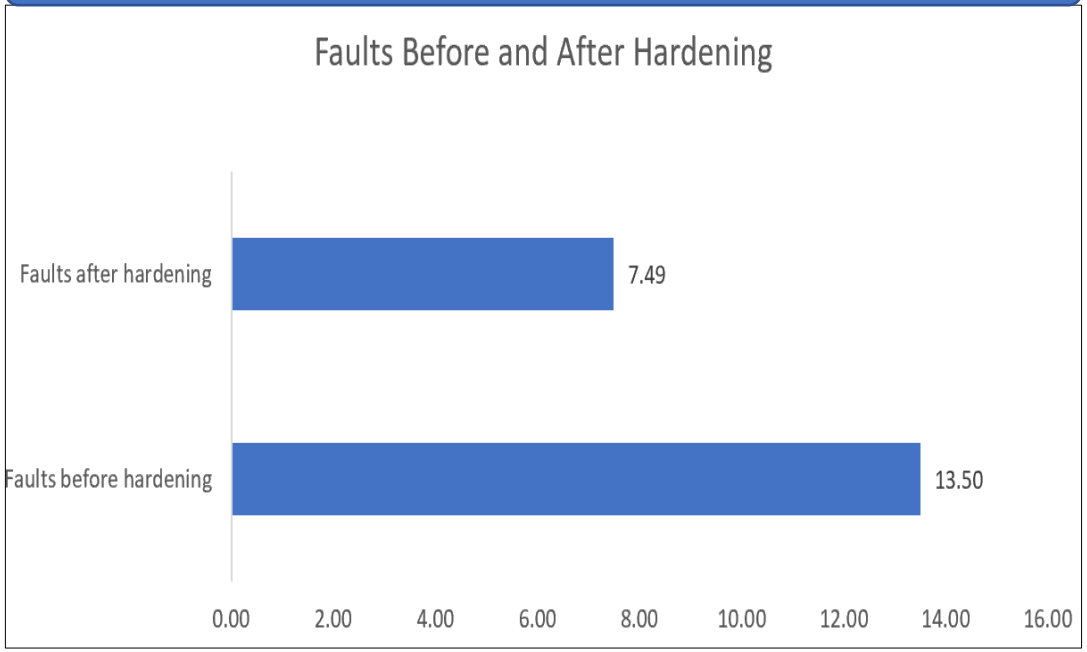
# Post-Mitigation LoRE Determination

$$RSE = \frac{\text{Risk Reduction} \times \text{Lifetime of Benefit}}{\text{Total Cost}}$$

## Calculation of Ignition Rate Reduction

- Utilizing efficacy studies, ignition counts, and/or SME input to produce ignition rate reductions for each mitigation
- Adjustment factor multiplied by Pre-Mit LoRE value to account for ignition rate reduction associated to mitigation

**Example: Traditional Hardening (TH) Efficacy Study Results**




**44.5%** Reduction of Faults that could lead to an Ignition

**Example: Covered Conductor (CC) SME-assisted Ignition Reduction Determination**

| Mode | Count of Ignitions | Covered Conductor Effect (Risk Reduction%) | Post Covered Conductor - Adjusted Count of Ignitions |
|---|---|---|---|
| Animal contact | 5 | 90% | 0.5 |
| Balloon contact | 8 | 90% | 0.8 |
| Vegetation contact | 10 | 90% | 1 |
| Vehicle contact | 14 | 20% | 11.2 |
| Other contact | 4 | 10% | 3.6 |
| Other | 2 | 10% | 1.8 |
| Equipment - All | 34 | 80% | 6.8 |
| Unknown | 3 | 10% | 2.7 |
| TOTAL | 80 | 65% | 28.4 |

**65%** Reduction of Ignition

# Post-Mitigation LoRE determination

$$RSE = \frac{\text{Risk Reduction} \times \text{Lifetime of Benefit}}{\text{Total Cost}}$$

$$Post\_Mit\ LoRE = Pre\_Mit\ LoRE * Ignition\ Rate\ Reduction$$

Example: LoRE Traditional Hardening determination

Given a Pre-Mit LoRE of **2.71** and a Traditional Hardening ignition rate reduction of **44.5%**

$$\text{Post\_Mit LoRE} = 2.71 \times (1 - 0.445)$$
$$= 1.504$$

*Illustrative*

Example: LoRE Covered Conductor determination

Given a Pre-Mit LoRE of **2.71** and a subjective Covered Conductor ignition rate reduction of **65%**

$$\text{Post\_Mit LoRE} = 2.71 \times (1 - 0.65)$$
$$= .948$$

*Illustrative*

# Net Present Value (Lifetime of Benefit)

$$RSE = \frac{\text{Risk Reduction} \times \text{Lifetime of Benefit}}{\text{Total Cost}}$$

## Net Present Value Determination: Adjustment factor to better assess benefits accrued over the lifetime of the mitigation

Utilizing a Present Value formula, the Lifetime of Benefit factor is calculated as follows:

$$\text{Lifetime of Benefit factor} = \sum_{i=0}^{n} \frac{1}{(1+r)^i}$$

$n$ = Total number of years of benefit expected

$i$ = cycles through years of accrued benefits

$r$ = rate at which benefit is depreciated year to year

Lifetime Risk Reduction = Risk Reduction x Lifetime of Benefit Factor

**Example: Net Present Value Determination of Covered Conductor (CC) WF Risk Reduction**

40 years of expected benefits, 3% year-to-year depreciated benefit

$$Lifetime\ Risk\ Reduction = 2.82 \times 10^{-1} \times \sum_{i=0}^{40} \frac{1}{(1+0.03)^i}$$

$$= 0.282 \times 23.11$$
$$= 6.52$$

*Illustrative*

# Total Cost Determination

$$RSE = \frac{\text{Risk Reduction x Lifetime of Benefit}}{\text{Total Cost}}$$

Total Cost : Total $ amount cost of the mitigation effort

$$\text{Total Cost } (\$) = \text{Number of Units} * \text{Cost Per Unit}$$

Calculated based on estimated* unit costs (For example, cost per mile, cost per asset, etc.)

Example: Total Cost of Covered Conductor (CC)

Assuming an estimated Covered Conductor cost per mile of $1.5M, and Segment A being 0.46 miles in length

$$\text{Total Cost } (\$k) = \text{Number of Miles} * \text{CC Cost Per Mile}$$
$$= 0.46 \times \$1{,}500{,}000$$
$$= \$690k$$

*Illustrative*

*Estimates calculated based off consultation with Subject Matter Experts, Project Planning teams, System Hardening teams, etc.

# RSE Calculation Summary Table

$$RSE = \frac{\text{Risk Reduction} \times \text{Lifetime of Benefit}}{\text{Total Cost}}$$

Example

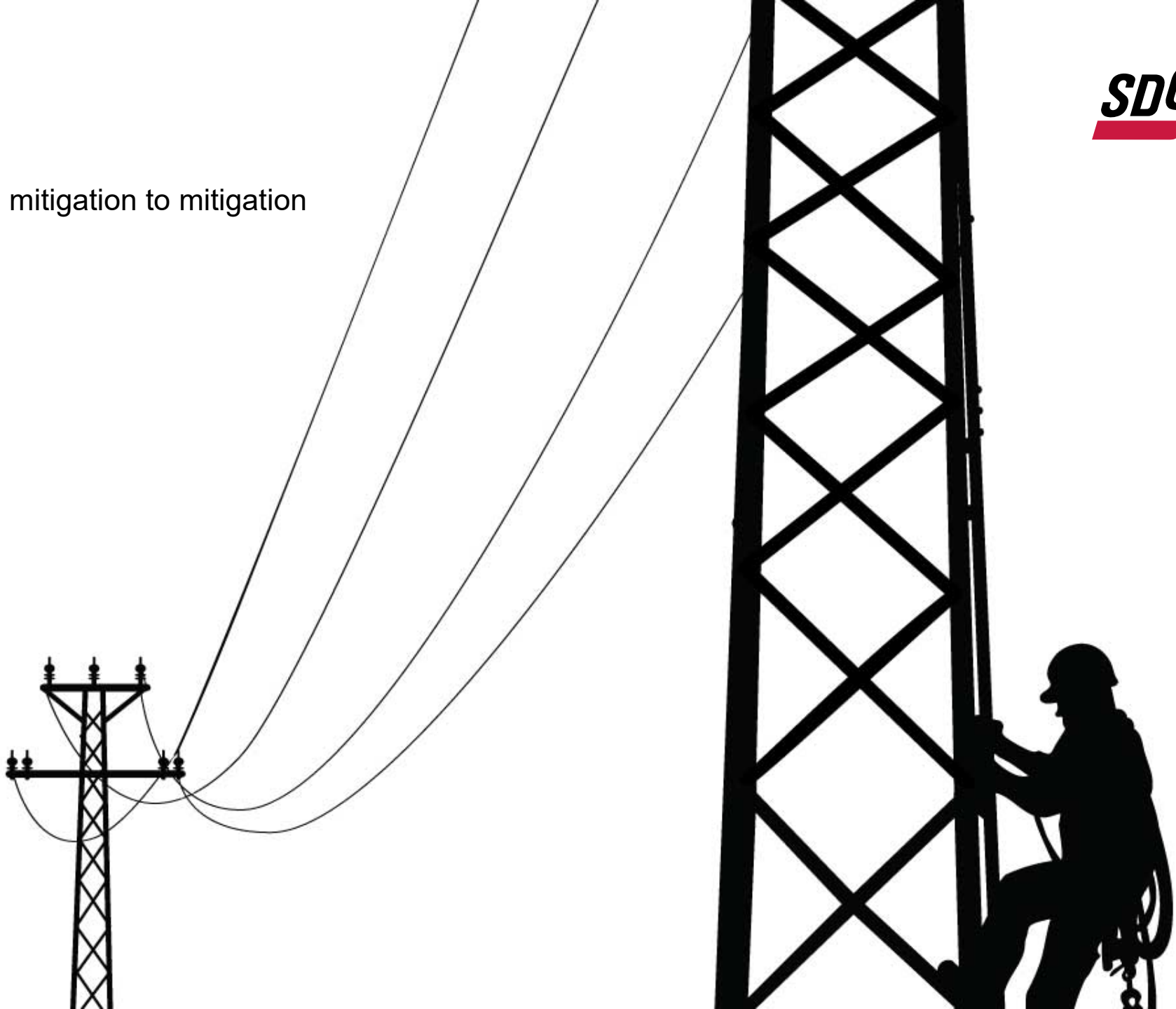
| | Miles/Quantity | Pre-Mit WF LoRE | WF CoRE | WF Risk Score | Cost Per Miles/Unit | Post-Mit WF LoRE | WF Risk Reduction | Lifetime Benefit Factor[1] | Lifetime WF Risk Reduction | Total Cost | WF RSE |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Covered Conductor** | 0.46 | 2.71 | 0.16 | 0.433 | $1.5M | 0.95 | 0.282 | 23.11 | 6.52 | $690k | 9.45 * 10^-6 |
| **Traditional Hardening** | 0.46 | 2.71 | 0.16 | 0.433 | $1M | 1.51 | 0.192 | 23.11 | 4.44 | $460k | 9.65 * 10^-6 |
| **Hot Line Clamps** | 100 | 2.71 | 0.16 | 0.433 | $1k | 1.80 | 0.1456 | 17.94 | 2.61 | $100k | 2.61 * 10^-5 |

*Illustrative*

[1]Lifetime benefit factor uses 3% discount rate based on federal recommendations at x # of years of benefit (40 years for CC & TH, 25 years for HLC)

# Assumptions

- Assumptions may vary from mitigation to mitigation
- Costs per unit
- Mitigation effectiveness
- Lifetime benefit



# Anticipated changes to RSE calculation methodology from now to 2023 WMP

- Update and improve risk assessment
  - Change in data sets and assumptions, as more data becomes available
  - Change in logic or analytical approach as different techniques are learned
  - Updated risk models as technology improves
  - Better unit cost estimation
- Incorporate life cycle costs and benefits of avoided costs resulting from grid hardening
- Continue to evaluate overall framework with input from stakeholders and other proceedings

# RSE Estimate Verification Process

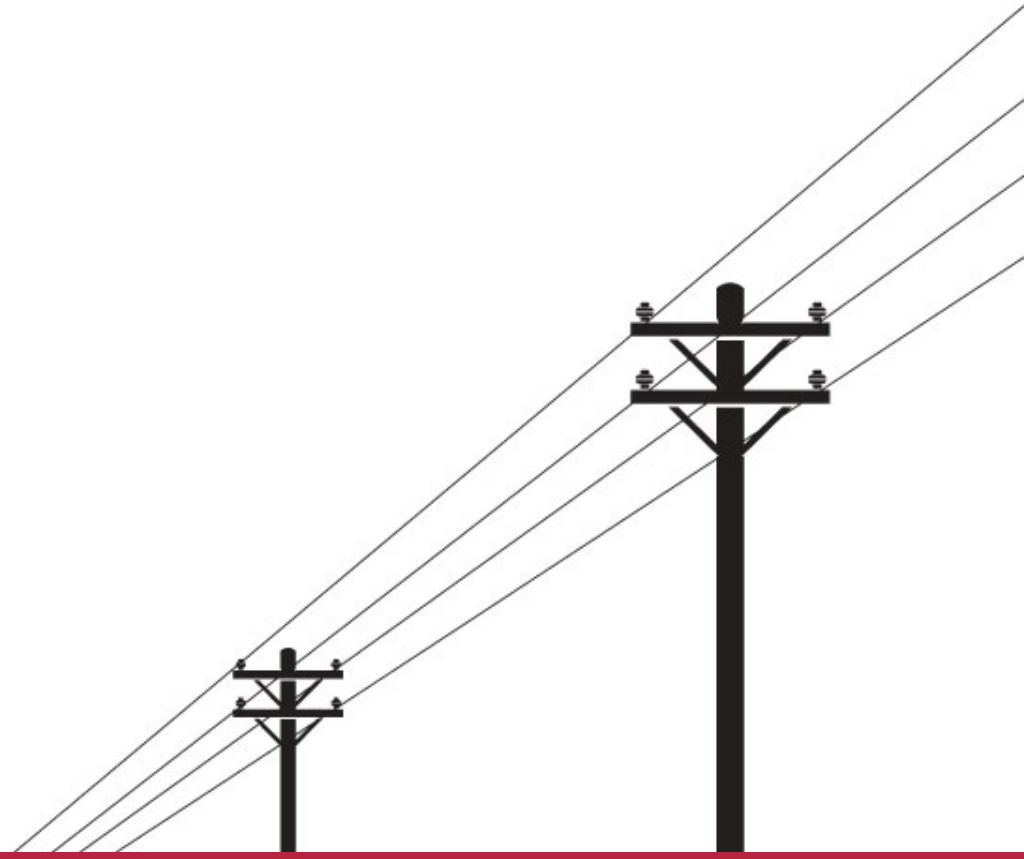
- SDG&E does not currently use confidence intervals and uncertainty in its assessments
- Continuing to evolve, expand and improve under the guidelines set forth by the CPUC
- RSE Estimate Verification Process:

Enterprise Risk Management

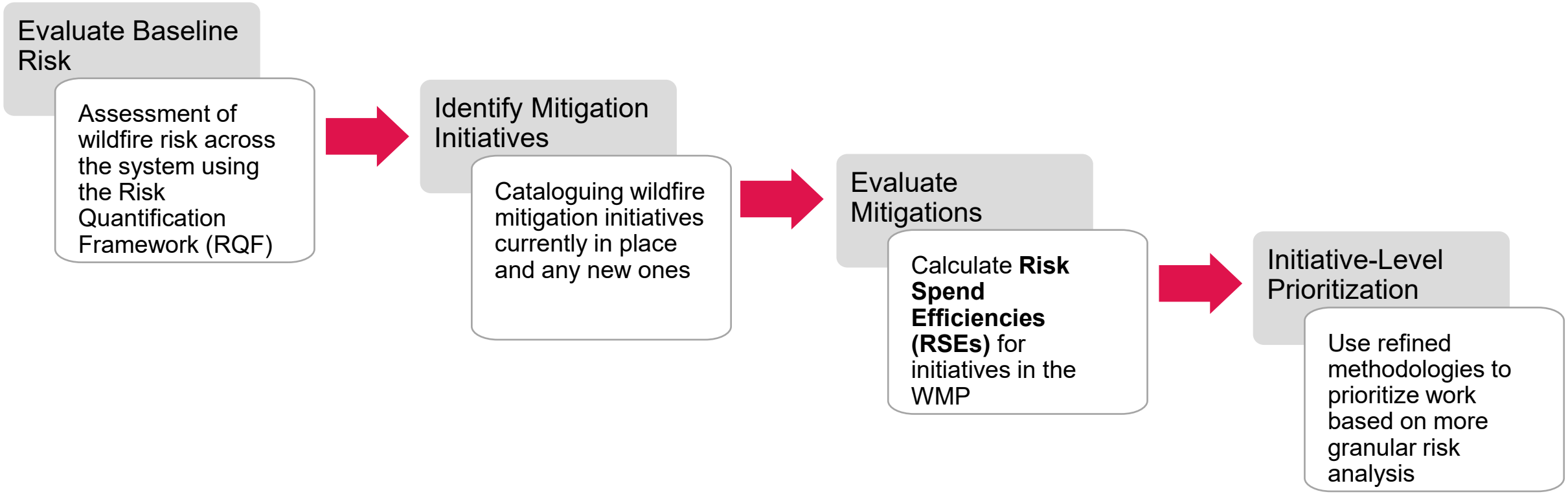
Subject Matter Experts

External Vendor Support

- 2022 WMP RSEs



# Risk-Informed Decision-Making Approach



# RSEs in Initiative-Selection Process

## Asset Management & Inspections

- Compliance requirements & SDG&E Standards determine frequency and type of inspection
- Inspection results determine if repair needed; repairs prioritized by condition and GO 95 timeline
- **RSEs** utilized after mitigation scoping as data points

## Vegetation Management & Inspections

- Compliance requirements & SDG&E Standards determine frequency and type of inspection
- Inspection results determine if pruning and/or removal, pole brushing required
- **RSEs** utilized after mitigation scoping as data points

## Grid Hardening

- Utilize WiNGS Model to generate segment-level **RSEs** and Wildfire Risk Rank
- Balance risk reduction and **RSE** to determine optimized portfolio
- Scoping, engineering & design, construction

# WiNGS Model Inputs and Outputs

## Inputs

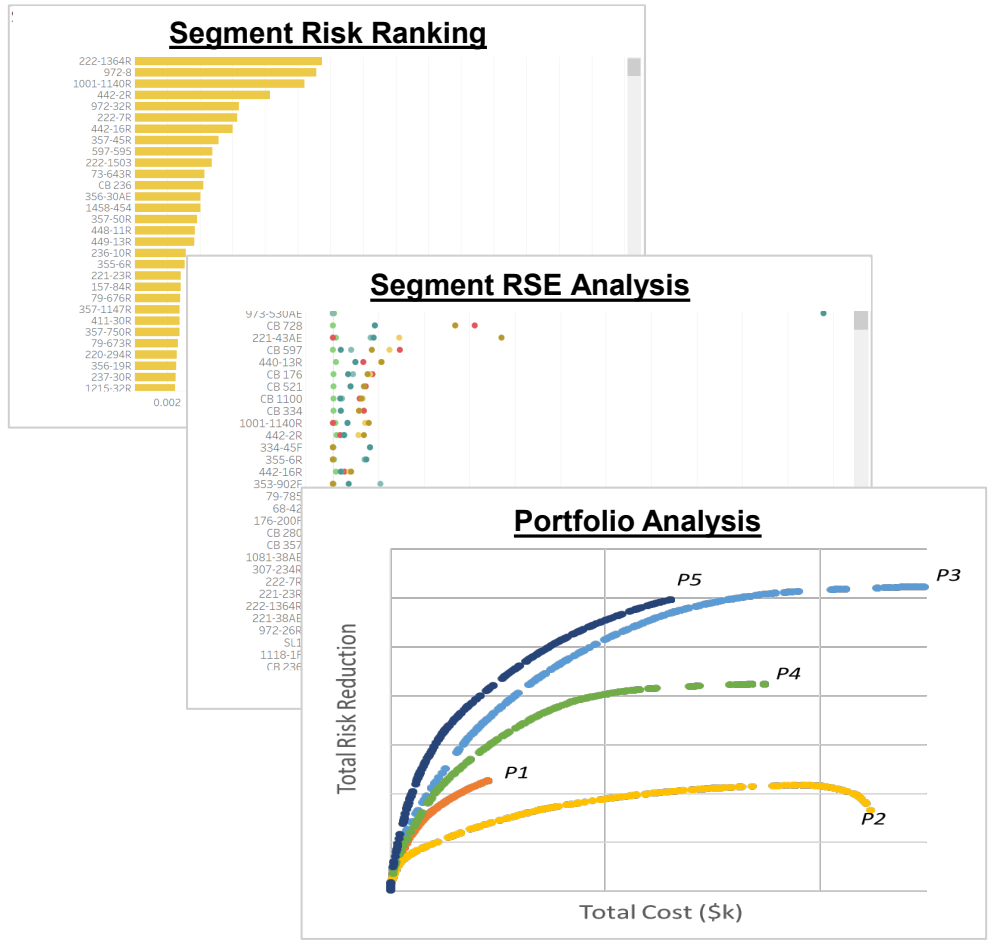
### Wildfire

| Likelihood | Consequence |
|---|---|
| • Historic ignitions<br>• Wind speed<br>• Tree strikes<br>• Hardening status<br>• Vegetation density<br>• Critical Health Index (CHI)<br>• Conductor age | • WRRM conditional impact |

### PSPS

| Likelihood | Consequence |
|---|---|
| • Annual RFW data<br>• Historic wind speed patterns<br>• Circuit connectivity | • Number of customers<br>• Customer type<br>• Outage duration |

## Outputs



# Wildfire – WiNGS Grid Hardening Scope

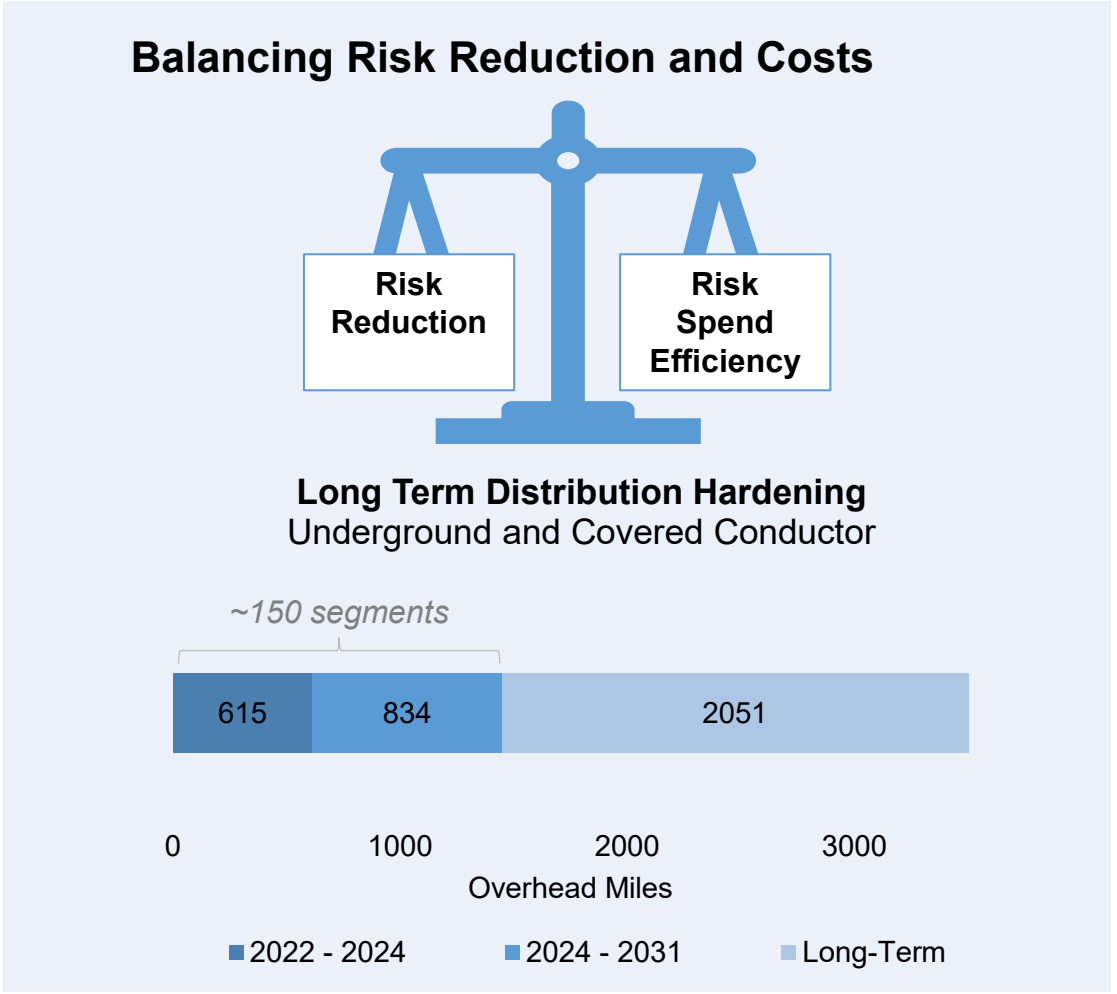
**Long-Term Objective:** Maximize wildfire risk reduction while selecting cost-effective mitigations

### Segments Selection and Prioritization

- Evaluate and compare baseline risk across > 600 segments
- Evaluate and compare RSE alternatives
- Identify top segments to prioritize grid hardening solutions on

### Outcome

- Identified ~150 segments to prioritize grid hardening mitigations on
- Remaining segments to be monitored and re-evaluated for other mitigation needs



# Initiative Selection Decision-Making Factors

RSEs are not the only criteria for determination of mitigation initiative

| Inspection & Replacement Cycles | Scoping Factors | Engineering & Design Factors | Construction Factors |
|---|---|---|---|
| • Compliance requirements and SDG&E standards for Asset Management<br>• Compliance requirements and SDG&E standards for Vegetation Management | • Desktop Feasibility results: geography, environmental, permitting, easements, existing infrastructure<br>• SME, Stakeholder input | • Survey results<br>• Agency and communication infrastructure provider coordination | • Availability of labor, raw materials<br>• Ability to work through land and permitting constraints |

# Anticipated Changes to How RSE Estimates are Used for Mitigation Initiative Selection for 2023 WMP

### Improve Accuracy of RSE Values

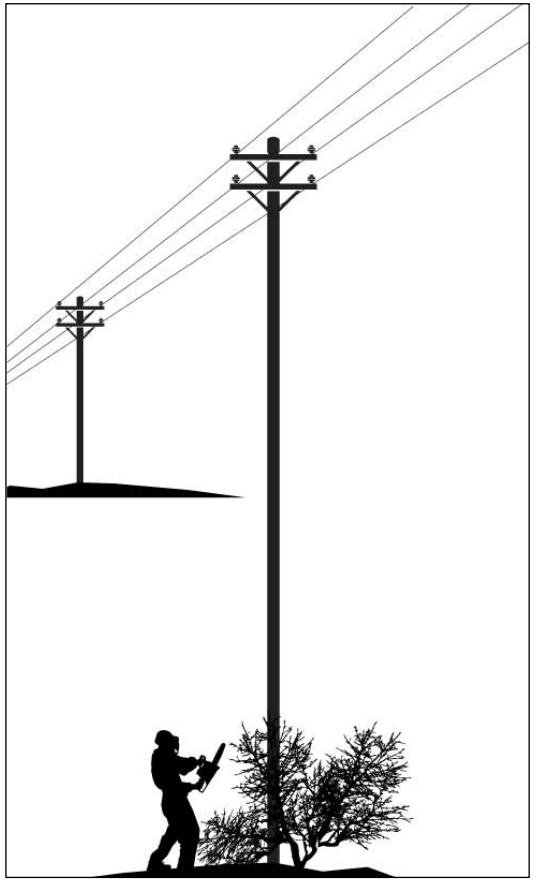
- Continuous enhancements to WiNGS Model
- Incorporate life cycle costs and benefits of avoided costs resulting from grid hardening
- Continuous improvement of PSPS risk quantification

### Develop Additional Tool* for Mitigation Initiative Selection

- Develop enterprise-wide capital allocation and planning tool

### Explore Opportunities to Apply RSEs

- Look for potential areas beyond grid hardening where similar RSE-based approach adds value to mitigation initiative selection



*Engagement with vendor initiated in 2021 but results may continue beyond 2023 WMP.

# Comprehensive Spreadsheet

December 17th report will include RSE summary spreadsheet

# Appendix

# Comprehensive Spreadsheet

## 1. MAVF Inputs for Risk Scoring

**Master Inputs**

**Discount Factors**

| | |
|---|---|
| Benefit Discount Factor | 3.00% |

**MAVF Framework**

| | Range | Weight |
|---|---|---|
| Safety Index | 20 | 60% |
| Reliability Index | 1 | 23% |
| Financial Cost | 500 | 15% |
| Stakeholder Satisfaction Index | 100 | 2% |

## 2. RSE Equations

*Risk Reduction*

$$(Pre-Mitigated\ LoRE * Pre-Mitigated\ CoRE) - (Post-Mitigated\ LoRE * Post-Mitigated\ CoRE)$$

*Discounted Time*

$$1 - \left( \frac{\frac{1}{(1+Benefit\ Discount\ Rate)^{Benefits\ Lifetime}}}{Benefit\ Discount\ Rate} \right)$$

*RSE per $M*

$$\frac{Risk\ Reduction * Discounted\ Time}{Total\ Cost\ (\$M)}$$

## 3. RSE Scoring Summary

| ID | Control/Mitigation Name | Lifetime Benefit | Total Cost ($k) | % Change in PSPS CoRE | PSPS LoRE | PSPS Pre-Mitigated CoRE | PSPS CoRE Safety | PSPS CoRE Reliability | PSPS CoRE Financial | PSPS CoRE Stakeholder Satisfaction | PSPS Post-Mitigated CoRE | PSPS Risk Reduction | % Change in Wildfire LoRE | Wildfire Pre-Mitigated LoRE | Wildfire CoRE | Wildfire Safety CoRE | Wildfire Reliability CoRE | Wildfire Financial CoRE | Wildfire Stakeholder Satisfaction CoRE | Wildfire Post-Mitigated LoRE | Wildfire Risk Reduction | Risk Reduction | Discounted Time | RSE per $Million | Source |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SDG&E-Risk-1-C3-T3 | Wireless Fault Indicators (Non-HFTD) | 25 | 616 | 0.00% | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 20.55% | 9.20 | 30.22 | 10.00 | 2.15 | 15.81 | 2.26 | 7.31 | 57.11 | 57.11 | 17.41 | 1516.03 | Reliability Data (2015-2019),2021 WMP Update Section 4.4.2.1 |
| SDG&E-Risk-1-C6/M1-T2 | SCADA Capacitors (HFTD Tier 2) | 25 | 1791 | 0.00% | 4.00 | 351.80 | 4.00 | 246.29 | 41.51 | 60.00 | 351.80 | 0.00 | 0.92% | 6.84 | 622.91 | 218.72 | 47.08 | 345.83 | 11.28 | 6.78 | 39.24 | 39.24 | 17.41 | 381.49 | 2021 WMP Update Section 4.4.2.1,SME, GIS Database |
| SDG&E-Risk-1-C7/M2-T1 | Overhead Distribution Fire Hardening – Covered Conductor (HFTD Tier 3) | 40 | 340611 | 0.01% | 4.00 | 820.87 | 9.33 | 574.67 | 96.87 | 140.00 | 820.76 | 0.40 | 6.61% | 5.13 | 1409.28 | 499.93 | 107.61 | 790.46 | 11.28 | 4.79 | 477.96 | 476.39 | 23.31 | 32.87 | 2021 WMP Update Section 4.4.2.3, 2021 WMP Update Section 4.4.2.1,SME |
| SDG&E-Risk-1-C7/M2-T2 | Overhead Distribution Fire Hardening – Covered Conductor (HFTD Tier 2) | 40 | 74746 | 0.00% | 4.00 | 351.80 | 4.00 | 246.29 | 41.51 | 60.00 | 351.80 | 0.00 | 1.04% | 6.84 | 622.91 | 218.72 | 47.08 | 345.83 | 11.28 | 6.77 | 44.11 | 44.11 | 23.31 | 13.64 | 2021 WMP Update Section 4.4.2.3, 2021 WMP Update Section 4.4.2.1,SME |
| SDG&E-Risk-1-C8/M3-T2 | Expulsion Fuse Replacement (HFTD Tier 2) | 25 | 3019 | 0.00% | 4.00 | 351.80 | 4.00 | 246.29 | 41.51 | 60.00 | 351.80 | 0.00 | 0.77% | 6.84 | 622.91 | 218.72 | 47.08 | 345.83 | 11.28 | 6.79 | 33.01 | 33.01 | 17.41 | 186.71 | GIS database,2021 WMP Update Section 4.4.2.1 |
| SDG&E-Risk-1-C9/M4-T1 | PSPS Sectionalizing (HFTD Tier 3) | 20 | 530 | 2.32% | 4.00 | 820.87 | 9.33 | 574.67 | 96.87 | 140.00 | 801.85 | 76.09 | 0.00% | 5.13 | 1409.28 | 499.93 | 107.61 | 790.46 | 11.28 | 5.13 | 0.00 | 76.09 | 14.84 | 2112.33 | Internal data, SME |
| SDG&E-Risk-1-C9/M4-T2 | PSPS Sectionalizing (HFTD Tier 2) | 20 | 4080 | 20.76% | 4.00 | 351.80 | 4.00 | 246.29 | 41.51 | 60.00 | 278.78 | 292.07 | 0.00% | 6.84 | 622.91 | 218.72 | 47.08 | 345.83 | 11.28 | 6.84 | 0.00 | 292.07 | 14.84 | 1062.66 | Internal data, SME |
| SDG&E-Risk-1-C10/M5-T2 | Recloserids (HFTD Tier 2) | 20 | 42103 | 6.10% | 4.00 | 351.80 | 4.00 | 246.29 | 41.51 | 60.00 | 330.32 | 85.93 | 0.00% | 6.84 | 622.91 | 218.72 | 47.08 | 345.83 | 11.28 | 6.84 | 0.00 | 85.91 | 14.84 | 30.15 | Internal data, SME |

Mitigation Name

Lifetime Benefit

Total Cost

PSPS CoRE & LoRE by MAVF Category

PSPS Risk Reduction

Wildfire CoRE & LoRE by MAVF Category

Wildfire Risk Reduction

Discounted Time

RSE per %Million

Total Risk Reduction

Source

# Comprehensive Spreadsheet

Example from 2021 RAMP RSE Summary

| ID | Control/Mitigation Name | 2021 WMP Initiative | Lifetime Benefit | Total Cost ($k) | % Change in PSPS CoRE | PSPS LoRE | PSPS Pre-Mitigated CoRE | PSPS CoRE Safety | PSPS CoRE Reliability | PSPS CoRE Financial | PSPS CoRE Stakeholder Satisfaction | PSPS Post-Mitigated CoRE | PSPS Risk Reduction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SDG&E-Risk-1-C3-T3 | Wireless Fault Indicators (Non HFTD) | 7.3.2.3 | 25 | $656 | 0.00% | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| SDG&E-Risk-1-C6/M1-T2 | SCADA Capacitors (HFTD Tier 2) | 7.3.3.1 | 25 | $1,791 | 0.00% | 4.00 | 351.80 | 4.00 | 246.29 | 41.51 | 60.00 | 351.80 | 0.00 |
| SDG&E-Risk-1-C12/M7-T1 | Hotline Clamps (HFTD Tier 3) | 7.3.3.10 | 25 | $4,503 | 0.00% | 4.00 | 820.87 | 9.33 | 574.67 | 96.87 | 140.00 | 820.87 | 0.00 |
| SDG&E-Risk-1-C16/M11-T1 | Strategic Undergrounding (HFTD Tier 3) | 7.3.3.16 | 40 | $629,679 | 2.49% | 4.00 | 820.87 | 9.33 | 574.67 | 96.87 | 140.00 | 800.44 | 81.69 |

| Control/Mitigation Name | % Change in Wildfire LoRE | Wildfire Pre-Mitigated LoRE | Wildfire CoRE | Wildfire Safety CoRE | Wildfire Reliability CoRE | Wildfire Financial CoRE | Wildfire Stakeholder Satisfaction CoRE | Wildfire Post-Mitigated LoRE | Wildfire Risk Reduction | Risk Reduction | Discounted Time | RSE per $Million | Source |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Wireless Fault Indicators (Non HFTD) | 20.55% | 9.20 | 30.22 | 10.00 | 2.15 | 15.81 | 2.26 | 7.31 | 57.11 | 57.11 | 17.41 | 1516.03 | Reliability Data (2015-2019), 2021 WMP Update Section 4.4.2.1 |
| SCADA Capacitors (HFTD Tier 2) | 0.92% | 6.84 | 622.91 | 218.72 | 47.08 | 345.83 | 11.28 | 6.78 | 39.24 | 39.24 | 17341.00 | 381.49 | 2021 WMP Update Section 4.4.2.1, SME, GIS Database |
| Hotline Clamps (HFTD Tier 3) | 0.33% | 5.13 | 1409.28 | 499.93 | 107.61 | 790.46 | 11.28 | 5.11 | 23.96 | 23.96 | 17.41 | 92.64 | 2021 WMP Update Section 4.4.2.1 & Table 7.1 |
| Strategic Undergrounding (HFTD Tier 3) | 57.60% | 5.13 | 1409.28 | 499.93 | 107.61 | 790.46 | 11.28 | 2.17 | 4246.45 | 4246.15 | 23.11 | 155.87 | Ignition Database (2014-2019), 2021 WMP Update Section 4.4.2.3, 2021 WMP Update Section 4.4.2.1 |

# Post-Mitigation LoRE determination

$$RSE = \frac{\text{Risk Reduction} \times \text{Lifetime of Benefit}}{\text{Total Cost}}$$

$$Post\_Mit\ LoRE = Pre\_Mit\ LoRE * Ignition\ Rate\ Reduction$$

The post mitigation LoRE for Covered Conductor is based on a similar methodology as the Traditional Hardening efficacy studies shown in the previous slide.

**Example: LoRE Covered Conductor determination**

Given a Pre-Mit LoRE of **2.71** and a subjective Covered Conductor ignition rate reduction of **65%**

$$\begin{aligned} \text{Post\_Mit LoRE} &= 2.71 \times (1 - 0.65) \\ &= .948 \end{aligned}$$

*Illustrative*

# Purpose of this workshop

Energy Safety intends to oversee a joint effort across utilities to collaborate on RSE calculation methodologies and utilization. The workshop provides an opportunity for stakeholder input regarding the focus areas of the RSE calculation methodologies and utilization.

| Workshop Timeline | |
|---|---|
| 9:00 am – 9:10 am | Introduction |
| 9:10 am – 10:10 am | PG&E Presentation |
| 10:10 am – 11:10 am | SCE Presentation |
| 11:10 am – 11:30 am | Break |
| 11:30 am – 12:30 pm | SDG&E Presentation |
| 12:30 pm – 1:30 pm | Lunch |
| 1:30 pm – 3:00 pm | Q&A Session |
| 3:00 pm – 3:20 pm | Break |
| 3:20 pm – 4:20 pm | RSE Expert Panel |
| 4:20 pm – 4:30 pm | Closing Remarks |

**Links:**

- 2021 RSE Workshop Presentation Structure
- TN10441_20211108T151246_Risk_Spend_Efficiency_Workshop_Notice