San Diego Gas & Electric

Risk Spend Efficiency Report

December 17, 2021

Introduction

On November 8, 2021, the Office of Energy Infrastructure Safety (OEIS) issued guidance for the risk spend efficiency (RSE) workshop which focused on bringing transparency and consistency across utilities in terms of RSEs, and to identify areas of alignment in methods, data and analysis. The guidance requested a written report on each utility's RSE efforts to provide a more detailed description of information provided during the utilities' presentations held during the December 9 RSE workshop. SDG&E provides its report herein.

SDG&E supports OEIS's efforts to facilitate collaboration and benchmarking among the California utilities and continues to engage with its peers both through formal and informal sessions. As discussed during the December 9 workshop, alignment on RSEs requires alignment on the Multi-Attribute Value Functions (MAVFs) and methodologies to calculate RSEs using a common framework. While this may seem like an optimal outcome, it's important to remember that changes to the MAVF for the sake of wildfire mitigation plans has an impact on all other risks that each utility manages that are unique to its circumstances and operating environment. These impacts and implications should be carefully considered when discussing potential changes to the MAVF. For these reasons, SDG&E continues to emphasize that any considered changes to the MAVF should be vetted in the CPUC's S-MAP due to its connection to the General Rate Case process, including the RAMP reporting requirements. Finally, SDG&E encourages OEIS to carefully examine the role of RSEs in the Wildfire Mitigation Plans to determine the weight RSEs fulfill in consideration to alternative metrics that can achieve comparability in the near-term. SDG&E continues to support such discussions and is willing to provide input on this matter.

As requested, SDG&E has prepared this RSE report to share the methodology, RSE estimate verification process and RSE initiative selection process. This report is outlined as follows:

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

Section 1: RSE Calculation methodology

Walkthrough of a RSE estimate calculation from start to finish

What is an RSE?

RSEs are numerical values that serve to portray changes in risk scores per dollar spent associated with an activity. They can also be thought of as a determination of the cost effectiveness of an activity, and a mechanism that helps IOUs, the CPUC, and OEIS understand the cost effectiveness of mitigations more effectively and the comparison of different mitigations in addressing risks across the service territory. The overall guiding principle of an RSE is that it presents the difference between the risk score over a certain span of time that the activity is undertaken over the dollar amount spent for that activity. The RSE value helps decision makers more quantitatively assess cost-benefit analysis on considered mitigations, which helps guide the mitigation portfolios created to be more effective, both on cost savings and risk reduction.

The basic formula for an RSE is as follows:

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

where

Risk Reduction = Direct risk score reduction associated to performing the activity
Lifetime of Benefit = Net Present Value (NPV) risk reduction adjustment factor to assess accrued lifetime of benefits associated to the activity
Total Cost = Total direct cost of the activity being performed

Risk score calculation

The risk score calculation pertains to the *risk reduction* element of the RSE equation (see bolded elements below)

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

For each risk element, there is an associated risk score. A risk element is designated as a part of the system that is being considered for an activity, such as a mitigation effort (e.g. a portion of the sub-circuit, an asset, the entire service territory, etc). The risk that element presents of an event occurring, e.g. causing an ignition, is calculated into a risk score. The risk score for that element as it is in the present state is called the baseline risk score, or the *pre-mitigation risk score.* The risk score formula is a product of two primary risk variables: Likelihood of Risk Event (LoRE) and Consequence of Risk Event (CoRE).

$$Risk\ Score\ =\ Likelihood\ of\ Risk\ Event\ (LoRE)\ x\ Consequence\ of\ Risk\ Event\ (CoRE)$$

The *LoRE* element is a likelihood metric that leverages ignition data to calculate the likelihood of a risk event occurring. The *CoRE* is a consequence metric that it calculated utilizing the Multi-Attribute Value Function (MAVF) framework, a framework the combines the potential consequences of the occurrence of a risk event across attributes to come up with a total measurement of a consequence value. The MAVF framework is based on four specific attributes related to a risk event:

Attribute	**Weight**	**Description**
Safety	60%	Measures average safety consequences if a risk were to occur in terms of potential fatalities and/or serious injuries
Financial	23%	Measures average financial consequences if a risk were to occur such as financial damage to property
Reliability	15%	Measures average reliability consequences if a risk were to occur in terms of SAIDI and SAIFI
Stakeholder Satisfaction	2%	Measures level of stakeholder satisfaction if a risk were to occur where stakeholders are defined as customers, public, employees, government and regulators

A more general risk score formula, that considers both the individual *CoRE* elements and the possibility of assessing multiple risk events, is as follows:

$$\textit{System Risk Score:}\ = \sum_{i=1}^{n}\sum_{j=1}^{4}(Pre\_Mitigation\ LoRE\ \times Post\_Mitigation\ CoRE\ )$$

where

n = Number of system risk events considered (e.g. WF risk, PSPS risk, etc.)
i = ystem risk elements assessed
j = Four attributes of the MAVF framework (safety, financial, reliability, and stakeholder satisfaction)

Example
As an example of how the risk score is calculated, we can look at the case of assessing wildfire risk for a system element. Assuming a *LoRE* value of 2.71, *CoRE* Safety score of 0.02, *CoRE* Reliability score of 0.10, *CoRE* Financial score of 0.03, and a *CoRE* Stakeholder Satisfaction score of 0.01, the calculation for the wildfire risk score would be as follows:

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

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

$$= 0.433$$

Risk Reduction Value Determination

The risk reduction value determination pertains to the *risk reduction* element of the RSE equation (see elements in bold below)

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

Once the baseline, or *pre-mitigation*, risk score is calculated, the *post-mitigation risk score* is then determined, with the difference of the two values being the risk reduction.

$$Risk\ Reduction = Pre\_Mitigation\ Risk\ Score - Post\_Mitigation\ Risk\ Score$$

The post-mitigation risk score is the result of an adjustment factor being applied to the pre-mitigation risk score, to adjust the risk score to account for the effectiveness of the considered mitigation (see 'Post-Mitigation LoRE' section below). That adjustment factor is calculated utilizing the best available data to determine the effectiveness of the mitigation. Some of the data sources utilized to come up with the adjustment factor include:

- Efficacy studies
- Historical ignition/outage data
- Subject Matter Expert (SME) driven input

The full general equation for the risk score reduction is as follows:

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

There are occasions (including in the calculation examples given in this section), where the mitigation only applies to the likelihood side of the equation (e.g. covered conductor), thereby the *CoRE* value will stay the same post-mitigation. That is, where only likelihood of the risk event is being reduced through the mitigation, then, and only then:

$$Pre\_Mitigation\ CoRE\ = \ Post\_Mitigation\ CoRE$$

<u>*Example*</u>

As an example of how this would be calculated, we can look at the case of assessing wildfire risk reduction of performing covered conductor mitigation on a system element. Considering that covered conductor specifically affects the likelihood aspect of the risk equation only (and therefore *Pre-Mitigation CoRE = Post_Mitigation CoRE*), and given a *Post-Mitigation LoRE* score of 0.948, and the same *Pre-Mitigation LoRE* and the same four *CoRE* MAVF score values from the risk score calculation example,

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

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

$$= .282$$

Post-Mitigation LoRE

The post-mitigation LoRE calculation pertains to the *risk reduction* element of the RSE equation (see elements in bold below)

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

To calculate the *Post-Mitigation LoRE*, data is utilized from efficacy studies, historical ignition counts, and/or SME input to determine the associated ignition rate reduction factors for each mitigation, which gets applied as a multiplying factor to the *Pre-Mitigation LoRE*

$$Post\_Mitigation\ LoRE = Pre\_Mitigation\ LoRE * \ Ignition\ Rate\ Reduction\ Factor$$

or

$$Post\_Mitigation\ LoRE = Pre\_Mitigation\ LoRE * \ (1 - Ignition\ Rate\ Reduction)$$

A similar approach is taken when determining the *Post-Mitigation CoRE*, for mitigations that address the consequence side of the system risk (e.g. firefighting resources).

Example

As an example of the calculation of *Post-Mitigation LoRE*, assuming an effectiveness rate of 65% for applying covered conductor to a circuit-portion, and the same *Pre-Mitigation LoRE* from the previous example,

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

Net Present Value (Lifetime of Benefit)

The Net Present Value (Lifetime of Benefit) calculation pertains to the *Lifetime of Benefit* and *Risk Reduction* elements of the RSE equation (see bolded elements below)

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

One of the more nuanced aspects of the RSE assessment is how to address risk-reducing activities that have long-term benefits. In some cases, the implications of an activity have long term effects: pipelines last many years, computer software can be used for several years, etc. To utilize RSEs properly, some consideration needs to be given for the length of time, or lifetime of benefit, of accrued risk reductions.

The Net Present Value (NPV), a financial function used to predict future benefits of long-term activities, is utilized in the RSE calculation on the risk reduction score itself, so as to predict the lifetime of the benefit that is assessed to be associated with the designated mitigation.

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

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

where

n = Total number of years of benefit expected
i = Years of accrued benefits
r = Rate at which benefit is depreciated year-to-year

For the rate utilized in the mitigations pursued, a 3% discount rate was applied for all the mitigations, based on federal recommendations as cited in SDG&E's 2021 RAMP filing, Document RAMP-C "Risk Quantification Framework and Risk Spend Efficiency."

To adjust from the initially calculated risk reduction to the adjusted lifetime risk reduction, the following equation is utilized:

$$Lifetime\ Risk\ Reduction\ =\ Risk\ Reduction\ x\ Lifetime\ of\ Benefit\ factor$$

Example
As an example of how the net present value, or lifetime of benefit, for risk reduction is calculated, we will use covered conductor as the mitigation of consideration. The lifetime risk reduction calculation will assume a rate of year-to-year benefit depreciation of 3%, 40 years of expected benefits for covered conductor, and the risk reduction score calculated in the earlier risk reduction value determination example,

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

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

Total Cost Determination

The total cost determination pertains to the *Total Cost* element of the RSE equation (see bolded elements below)

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

The total cost refers to the direct cost amount of the mitigation activity being considered. The total cost is calculated based on the number of units, nature of those units, and associated unit cost (e.g. miles of circuit mitigated at cost per mile, number of assets changed out at cost per quantity). The associated unit cost is estimated and calculated based on consultation with SMEs, project planning teams, system hardening teams, and others.

The general equation for calculating the cost is as follows:

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

Example

As an example of how the total cost is determined, taking covered conductor as the mitigation considered, assuming a circuit-portion mileage of 0.46 miles, and cost per mile for covered conductor to be $1.5M,

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

Discussion of any assumptions within the calculations

RSE are one of many data points that SDG&E considers when assessing strategic decision making around mitigation selections, but it is not the sole factor considered when choosing the optimal mitigation. The RSE calculation and methodology, like any other model-based metric, is built upon inherent assumptions and uncertainties. Assumptions influence the calculation and ultimately are embedded within the value output. Additionally, there are uncertainties and assumptions inherent to risk assessment, as no model-based metric is fully able to consider all the real-world variables associated with a risk event. Because of that, SDG&E also considers SME input and judgement, particularly when interpreting the RSE values for the purposes of strategic mitigation implementation and prioritization (See Section 4).

The assumptions around the RSE calculations may vary from mitigation to mitigation, but a partial list of a few of the assumptions that go into RSE calculation are as follows:

- Costs per Unit
    - Cost approximations determined by SMEs, planning teams, etc.
- Mitigation Effectiveness
    - Assumptions of the effectiveness of applying a given mitigation, based on SME input and/or efficacy studies.
- Lifetime benefit
    - Assumption of the extent of benefit accrued (e.g. 40 years) and the rate of benefit depreciated year-to-year (e.g. 3%)

The assumptions made in the RSE calculation utilize the best available resources that most accurately estimate the various variables that go into determining the RSE value. SDG&E is always looking to improve upon the accuracy and predictability of its metrics and models, for example with data updates based on actual numbers as mitigations are completed, and to reduce uncertainty and assumptions built into them, wherever possible. Where it is not possible, the assumptions and uncertainties are considered in the development of the implementation methodology of the metric (See Section 4)

Anticipated changes to RSE calculation methodology from now to 2023 WMP

Changes and updates anticipated to be made from now until the release of the 2023 WMP include the following:

- Utilizing the latest up-to-date data sets and assumptions, as more data becomes available
- Improvements in logic or analytical approach as different techniques are learned
- Updated risk models as modeling methodologies improve
- More precise unit cost estimation
- Incorporation of life cycle costs and benefits of avoided costs resulting from grid hardening
- Continuing to evaluate overall framework with input from stakeholders and other proceedings

Section 2: RSE Estimate Verification Process

Confidence values of RSE estimates, including how the confidences were determined

Range of uncertainty for the RSE estimates, including how those ranges were determined and how uncertainties are minimized

How uncertainty affects the interpretation and utilization of the RSE estimates

There are at least two types of risk assessments that occur at SDG&E: the first focuses on the amount of risk present, and the second focuses on how to reduce risk. The first type of risk assessment uses simulations (Monte Carlo modeling[1] to estimate outcomes, and that type of assessment inherently has confidence intervals present. The second type uses expected values to estimate the effectiveness of a project and does not use confidence intervals. SDG&E is continuing to identify improvement opportunities to enhance the risk assessment.

[1] *Please reference page 27 for further details at this link: https://www.sdge.com/sites/default/files/regulatory/SCG_SDGE_RAMP-C_Risk_Quantification_Framework_and_Risk_Spend_Efficiency_5-17-21.pdf page 27/50*

Systems used to verify the RSE estimates, including:

- Subject matter experts
- Comparison against historical data
- Third-part assessment
- Cross-utility verification

Subject Matter Experts (SMEs) play a key role in the verification process due to their inherent knowledge and experience. The RSEs are reviewed by internal SMEs to validate the data and assumptions, especially for areas where there is minimal or insufficient data. SDG&E has engaged external vendors that are starting to assess and review the RAMP 2021 RSEs and helping identify potential areas of improvement. Additionally, they will be supporting SDG&E in the development and validation of the RSE estimates for the 2022 WMP.

Anticipated changes to RSE estimate verification process from now to 2023 WMP

SDG&E's wildfire risk assessment is an on-going effort which is updated as new data is collected and when new studies are undertaken. SDG&E's Enterprise Risk Management team continually evaluates its wildfire risk assessments regarding the probability of ignitions and the consequences of wildfires and develops the Risk Spend Efficiency.

Section 3: RSE Estimate and Initiative-Selection Process

Overview of the Initiative-Selection Process

SDG&E follows a risk-informed decision-making approach for prioritizing work based on more granular risk analysis. Baseline risk is evaluated across the system using the MAVF, or the Risk Quantification Framework (RQF) for safety, reliability, financial and stakeholder satisfaction attributes and the methodology discussed in Section 1.

SDG&E has identified mitigation initiatives documented in Table 12 of the 2021 WMP. The drivers for mitigations range from compliance requirements (e.g., annual tree-trimming of inventory trees, High-Fire Threat District (HFTD) Tier 3 Inspections), new or improved technology (e.g., Drone Assessments), and analyzing equipment failures. For example, identifying high conductor risk associated with smaller copper wire led to the development of the Fire Risk Mitigation Program [FiRM] to replace small copper wire with hardened wire and the Pole Risk Mitigation and Engineering Program [PRiME] to change wood poles to steel poles. SDG&E continues to review qualitative and quantitative metrics and evaluate mitigations through third party studies and benchmarking with other utilities to amend the catalogue of initiatives. RSEs are calculated for the mitigations where risk reduction and cost can be quantified.

In 2020, SDG&E developed the innovative Wildfire Next Generation System model (WiNGS). Building upon the RSE methodology, WiNGS aims to evaluate both wildfire and PSPS impacts at the sub-circuit/segment level to inform investment decisions by determining which grid hardening initiatives provide the greatest benefit per dollar spent in reducing both wildfire risk and PSPS impact.

How RSE estimates are considered when selecting a mitigation initiative

While SDG&E calculates RSEs for all the mitigations where risk reduction by quantitative and/or qualitative data and cost information can be obtained, RSEs are utilized differently in the initiative-selection process across mitigation programs.

For Asset and Vegetation Management Inspections, typically cyclical programs, frequency and type of inspection is driven by compliance requirements and SDG&E standards. RSEs are calculated for different asset and vegetation management initiatives, based on the methodology discussed in Section 1, but SDG&E utilizes these RSEs after mitigation scoping as data points for subsequent evaluation and for comparison of mitigations within the portfolio of initiatives. For large capital allocation programs, specifically grid hardening initiatives such as undergrounding and covered conductor, SDG&E uses the WiNGS model to help inform scoping decisions. From scoping to execution, grid hardening initiatives can take 18+ months; therefore, the WiNGS model will most influence 2023 scoping and beyond at this point in time.

The WiNGS model takes in various system attribute data at the granularity of a sub-circuit, or segment, level and calculates output variables for each of the segments, utilizing a mixture of conditional and linear equations, based upon the MAVF framework. Current WiNGS inputs include system attributes such as: segment length, conditional impact of fire, wind speed attributes, PSPS probabilities, among others; the outputs WiNGS computes include the baseline risk score for each segment, mitigation specific RSEs, and analyses of different portfolios of mitigation mixes (See Section 1).

Through the WiNGS model, SDG&E evaluates and compares baseline risk across over 600 segments, evaluates and compares RSEs across grid hardening mitigations and identifies the top segments to prioritize grid hardening mitigations on. The remaining segments continue to be monitored and re-evaluated for other non-grid hardening mitigation opportunities. RSEs provide a useful tool to identify optimized portfolios of traditional hardening, covered conductor, and undergrounding to balance risk reduction and cost across the system.

How do RSE estimates compare to other decision-making factors

RSEs are not the only criteria that SDG&E uses to determine what mitigation initiative to select on a specific circuit-segment or circuit. In addition to compliance requirements and SDG&E standards across its service territory, SDG&E also reviews feasibility of implementation, particularly in grid hardening mitigations, across numerous criteria.

To determine the feasibility of a grid hardening initiative after the WiNGS model has identified an optimal mitigation based on a portfolio-wide risk reduction and cost balance, SDG&E completes a desktop feasibility review. Site geography, environmental and cultural factors, permitting and easement requirements, and existing infrastructure are identified and reviewed; SME and stakeholder input is critical to identify any additional constraints that may impact a mitigation, particularly if the scope includes moving from an overhead to an underground system. SMEs also provide valuable information regarding the impact of a mitigation on system reliability and customer impact. Further information is obtained during site surveying which may impact engineering and design; additionally, external stakeholders including agencies, communities, and communication infrastructure providers are contacted to identify additional constraints. Finally, construction of a selected grid hardening mitigation initiative is still subject to the ability to work through other feasibility constraints and availability of labor and raw materials.

Anticipated changes to how RSE estimates are used for mitigation initiative selection from now to 2023 WMP

Changes and updates anticipated to be made from now until the release of the 2023 WMP include the following:

- Improve the accuracy of RSE values through WiNGS enhancements, unit cost updates and incorporation of life cycle costs and benefits of avoided costs resulting from grid hardening.
- Development of an enterprise-wide capital allocation and planning tool.
- Exploring potential programs beyond grid hardening to utilize RSEs as a factor for scoping.

In 2021, SDG&E engaged with a vendor to initiate the development of an enterprise-wide capital allocation and planning tool. While the results of the enterprise-wide tool will utilize RSEs and other data collected company-wide, the results are not anticipated by the 2023 WMP. But available information will be reviewed and utilized to the extent it is reasonable. SDG&E will learn from this workshop and further discussions with regulators and other stakeholders about most appropriate and reasonable uses of RSEs while continuing to refine current methodology and data associated with RSE use in grid hardening mitigation selection.

Section 4: Comprehensive Spreadsheet

A spreadsheet containing risk reduction value, total cost, NPV, confidence, and uncertainty for each initiative that has a non-zero RSE value from the 2021 WMP Update

See attached spreadsheet below

Metric type	2021 WMP Initiative #	Initiative activity	Lifetime of Benefit	Discounted Time	Total Risk Reduction	Total NPV Risk Reduction	Total Cost ($k)	Total RSE (per $M)
Other	7.3.2.3	Fault indicators for detecting faults on electric lines and equipment [Wireless fault indicators]	25	17.41	15.56	270.88	2,147	126.15
Grid hardening	7.3.3.1	Capacitor maintenance and replacement program [SCADA capacitors]	25	17.41	136.92	2,384.28	4,370	545.61
Grid hardening	7.3.3.3	Covered conductor installation	40	23.11	483.80	11,182.81	156,798	71.32
Grid hardening	7.3.3.7	Expulsion fuse replacement	25	17.41	541.24	9,424.70	19,777	476.54
Grid hardening	7.3.3.8.1	PSPS sectionalizing enhancements	20	14.88	350.51	5,214.68	8,925	584.30
Grid hardening	7.3.3.8.2	Microgrids	20	14.88	79.90	1,188.77	38,621	30.78
Grid hardening	7.3.3.9	Installation of system automation equipment (Advanced Protection)	25	17.41	503.06	8,759.85	31,165	281.08
Grid hardening	7.3.3.10	Maintenance, repair, and replacement of connectors, including hotline clamps	25	17.41	45.86	798.61	12,962	61.61
Grid hardening	7.3.3.11.1	Resiliency Grant Programs	10	8.53	147.60	1,259.03	20,876	60.31
Grid hardening	7.3.3.11.2	Standby Power Programs	15	11.94	168.54	2,012.07	22,454	89.61
Grid hardening	7.3.3.11.3	Resiliency Assistance Programs	10	8.53	193.00	1,646.33	4,417	372.76
Grid hardening	7.3.3.16	Undergrounding of electric lines and/or equipment (Strategic undergrounding)	40	23.11	919.49	21,253.77	364,559	58.30
Grid hardening	7.3.3.17.1	Distribution overhead system hardening (Bare Conductor Hardening)	40	23.11	462.63	10,693.54	240,954	44.38
Grid hardening	7.3.3.17.3	Cleveland National Forest fire hardening - Distribution OH	40	23.11	120.78	2,791.70	53,236	52.44
Grid hardening	7.3.3.17.3	Cleveland National Forest fire hardening - Distribution UG	40	23.11	72.76	1,681.72	44,024	38.20
Grid hardening	7.3.3.18.2	Lightning arrestor removal and replacement	25	17.41	9.45	164.52	3,927	41.89
Asset inspection	7.3.4.1	Detailed inspections of distribution electric lines and equipment (5-year detailed inspections)	1	0.97	1,604.95	1,558.20	28,654	54.38
Asset inspection	7.3.4.4	Infrared inspections of distribution electric lines and equipment	1	0.97	197.19	191.45	524	365.55
Asset inspection	7.3.4.6	Intrusive pole inspections	1	0.97	338.26	328.41	5,992	54.81
Asset inspection	7.3.4.9.1	HFTD Tier 3 Inspections	1	0.97	811.70	788.06	7,380	106.78
Asset inspection	7.3.4.9.2	Drone assessments of distribution infrastructure	1	0.97	2,038.84	1,979.45	156,677	12.63
Asset inspection	7.3.4.9.3	Circuit ownership	1	0.97	2.59	2.51	291	8.63
Asset inspection	7.3.4.10	Patrol inspections of distribution electric lines and equipment - CMP	1	0.97	1,320.51	1,282.04	3,477	368.71
Vegetation inspection	7.3.5.2	Detailed inspections of vegetation around distribution electric lines and equipment (tree trimming)	1	0.97	15,158.33	14,716.82	157,321	93.55
Vegetation management project	7.3.5.5	Fuel management and reduction of “slash” from vegetation management activities	1	0.97	536.24	520.62	18,218	28.58
Vegetation inspection	7.3.5.9	Other discretionary inspection of vegetation around distribution electric lines and equipment, beyond inspections mandated by rules and regulations (Enhanced inspections, patrols, and trims)	40	23.11	121.09	2,798.98	30,705	91.16
Vegetation management project	7.3.5.20	Vegetation management to achieve clearances around electric lines and equipment (Pole brushing)	1	0.97	3,594.19	3,489.50	16,300	214.08
Other	7.3.6.1.1	Recloser protocols	1	0.97	23,289.88	22,611.54	49	458,335.76
Other	7.3.6.1.2	Sensitive/Fast Protection settings	1	0.97	4,015.41	3,898.46	49	79,025.00
Other	7.3.6.2	Crew accompanying ignition prevention and suppression resources and services (Wildfire infrastructure protection teams – Contract fire resources)	1	0.97	604.54	586.93	8,460	69.38
Other	7.3.6.3	Personnel work procedures and training in conditions of elevated fire risk (Other special work procedures)	1	0.97	120.77	117.26	1,500	78.17
Other	7.3.6.5	PSPS events and mitigation of PSPS impacts	1	0.97	6,092.30	5,914.86	63,323	93.41
Other	7.3.6.6.1	Aviation firefighting program	10	8.53	112.73	961.60	44,436	21.64