(U 338-E)

Southern California Edison Company

SCE 2026 RAMP Tranching White Paper

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November 3, 2025

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I.

INTRODUCTION AND PURPOSE

This White Paper describes Southern California Edison's (SCE) anticipated approach to risk tranching in its forthcoming Risk Assessment and Mitigation Phase (RAMP) report. SCE will file that RAMP report with the California Public Utilities Commission (CPUC or Commission) in May 2026.

A. CPUC Quintile Best Practice Approach

A key issue in Phase III of the Risk-Based Decision-Making Framework (RDF) proceeding was determining the appropriate granularity of "tranches" (subdivisions of assets or risks) for reporting and analysis in RAMP and GRC (General Rate Case) filings.[1] In an effort to improve the transparency, consistency, and effectiveness of risk assessment and mitigation planning by investor-owned utilities (IOUs), the Commission adopted the Safety and Policy Division's (SPD) proposal as a best practice: IOUs must, in most cases, determine reporting tranches using combinations of quintiles (20% groupings) of Likelihood of Risk Event (LoRE) and Consequence of Risk Event (CoRE). This approach results in 25 (5x5) tranches, each representing a unique combination of LoRE and CoRE quintiles ("Quintile Approach").[2]

The rationale the Commission provided for the "Quintile Approach" is that each tranche should have a homogeneous risk profile - assets or systems within a tranche should have similar risk characteristics (i.e., similar LoRE and CoRE values) – and that the level of tranche granularity balances the Commission's goal to assess whether IOUs are targeting mitigations at the riskiest portions of their infrastructure, while not being overly granular.[3] By requiring a uniform Quintile tranching approach across all IOUs and all risks, the Commission's goal was to ensure that the greatest risk reduction

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1 D.24-05-064, pp. 15–36.

2 D.24-05-064, pp. 26 – 27.

3 D.24-05-064, p. 28.

benefits are achieved in a transparent manner at the lowest cost, supporting just, reasonable, and affordable rates.[4]

The Commission recognized that if there are fewer than 25 assets or systems for a given risk, the, IOUs may use quartiles, or other smaller divisions, in lieu of the Quintile Approach, but must explain their rationale for their proposed approach.[5] Specifically, if IOUs wish to use a different tranching method (e.g., more than 25 tranches, or a non-Quintile Approach), then they must submit a White Paper justifying their proposed tranching methodology, so that it can be reviewed and discussed prior to implementation in their RAMP report.[6] Based on this guidance, SCE has developed this White Paper to explain its rationale for deviating from the Quintile Approach for certain of its preliminary RAMP risks.

B. Summary of Tranching Method by Risk

Consistent with Commission guidance, SCE first attempted to apply the Quintile Approach to each of its preliminary RAMP risks. Where the Quintile Approach was not practical, SCE then documented the rationale for deviating from this methodology, along with justifications for the proposed alternative approach. Reasons for needing to deviate from the Quintile Approach differed by risk but generally revolved around the nature of how the risk is managed, the availability of data, or other relevant factors.

In Table I-1 below, SCE summarizes which of its preliminary RAMP risks will utilize the Quantile Approach (e.g., *Wildfire, Public Safety Power Shutoff (PSPS)*, *Overhead Asset Failure and Underground Asset Failure*), as well as its proposal for which risks may follow alternative tranching approaches. In Sections I.C to I.H, SCE provides a brief discussion of why the Quintile Approach may be inappropriate, as well as its proposed alternative tranching approach.

While SCE is open to feedback regarding these alternative tranching proposals, it notes that its tranching approach may ultimately change to ensure compliance with all pre-existing and new

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4 D.24-05-064, p. 28.

5 D.24-05-064, p. 33.

6 D.24-05-064, p. 33.

requirements from the Risk OIR Phase IV Decision,[7] the full implications of which we are still in the process of discerning.

Table I-1
SCE's Proposed Tranching Approach by Risk

Risk	Number of Proposed Tranches	Proposed Tranching Approach
Employee Safety	3	• Office • Field (High Hazard) • Field (Other)
Contractor Safety	3	• Transmission & Distribution • Vegetation Management • Other
Cyber Attack	5	• Admin • Grid • Third Parties • Employees • Applications
Hydro Dam Failure	26	• Each of SCE's significant-hazard dams is a tranche
Wildfire	25	• 5 x 5 Quintile
PSPS	25	• 5 x 5 Quintile
Overhead Asset Failure	25	• 5 x 5 Quintile
Underground Asset Failure	25	• 5 x 5 Quintile
Seismic	4	• SCE's seismic resiliency program
Major Physical Security Incident	5	• Transmission (Tier 1-3) • Transmission (Tier 4-5) • Major Business Function (as defined below) • Generation (Hydro) • Generation (General)
Public Contact	Varies by Sub-Risk	• Varies by Sub-Risk

[7] D.25-08-032.

C. Employee and Contractor Safety

1. Risk Description

SCE's Employee and Contractor Safety activities include all of SCE's programs and activities to eliminate serious injuries and fatalities, reduce all types of employee injuries, and strengthen its safety culture. It also includes the protocols SCE follows to support contractor safety management.

SCE's vision for employee and contractor safety is to augment its safety culture, eliminate serious injuries and fatalities, and reduce all injuries. Edison Safety is the lead organization that provides guidance, governance, and oversight concerning SCE's safety programs and activities that focus closely on worker safety to accomplish the goal of creating an injury-free workplace. Its efforts include, but are not limited to, developing and managing programs to meet requirements as outlined by governing regulatory agencies. Such agencies include the Occupational Safety and Health Administration (OSHA) and the California Division of Occupational Safety and Health (Cal/OSHA).

SCE employees perform a diverse set of activities to provide safe, reliable, affordable, and clean electricity to its customers across a 50,000-square-mile service area. These efforts include:

- Installing and replacing transmission and distribution utility poles, towers, and electrical overhead conductors and underground cables;
- Managing vegetation around overhead equipment;
- Maintaining electrical assets at over 800 substations;
- Maintaining administrative and operational facilities that support grid operations;
- Transporting tools and equipment to worksites; and
- Performing office work to support all of the above activities.

SCE contractors perform a variety of work, including certain high-hazard tasks that SCE employees may not regularly perform. Some examples of the work performed by SCE contractors include but are not limited to:

- Transmission and distribution line construction;
- Vegetation management;

- Hazard tree removal;
- Crane operations;
- Traffic control;
- Helicopter operation;
- Drone operations;
- Civil operations (horizontal directional drilling and jack and bore);
- Substation operation and maintenance;
- Generation maintenance;
- Heavy civil equipment operation;
- Environmental monitoring;
- Material transport;
- Corporate real estate management.

2. SCE's Proposed Tranching Methodology

SCE evaluated using the Quintile Approach to tranche Employee and Contractor safety risk but determined that this method may not be appropriate for this risk. The rationale for this conclusion is outlined below.

SCE does not calculate or track LoRE or CoRE at the individual employee or contractor level. Instead, risk is assessed and managed based on work type. Attempting to estimate LoRE and CoRE for discrete employees or contractors would introduce significant variability and misalignment with SCE's operational approach.

SCE has identified employees engaged in Field (high hazard) work and contractors performing Vegetation Management as exposed to the highest likelihood of risk. For instance, in Employee Safety, while all employees receive some form of baseline safety training, office employees do not receive the same types of training as field employees. Field employees operate in dynamic and potentially hazardous settings such as construction sites, substations, and remote locations. Their heightened exposure to risks requires specialized training, equipment, and procedural safeguards

that are not applicable to office employees. Accordingly, SCE has designed its controls and mitigations by work type, ensuring alignment with how risk is experienced and managed in practice, and fostering efficiency.

For similar reasons, SCE has chosen to tranche Contractor Safety risk based on the work type. Mitigations and controls for SCE Contractors are designed to address risk drivers unique to their individual operational environments. For example, the training programs for Transmission and Distribution contractors differ from those faced by Vegetation Management contractors. By segmenting data into tranches that reflect operationally similar functions, SCE's proposed tranching approach reflects the practical realities of its operations.

Table I-2 (below) summarizes the tranches of Employee and Contractor Safety risk based on the risk profiles of each work type.

Table I-2
SCE's Proposed Employee and Contractor Safety Tranches[8]

RAMP Risk	Proposed Tranching
Employee Safety	• Office • Field (High Hazard) • Field (Other)
Contractor Safety	• Transmission & Distribution • Vegetation Management • Other

D. Cyber Attack

1. Risk Description

SCE defines Cyber risk as the disruption of operations leading to damage, destruction, or interruption to critical business functions, either through loss of data reduced data integrity, loss of control, adversary control of grid control systems/SCADA, and/or ransomware attacks. Such attacks could also result in the failure to deliver electricity to customers, compromise of sensitive confidential

[8] In this context, SCE has defined Field (High Hazard) employees as those who perform specific high hazard work types such as Lineman, Troubleman, Apprentice Lineman, or Groundman. Field (Other) are field employees not belonging to the above-listed job classifications.

personal and other data, loss of intellectual property, loss of the grid for an extended period, and/or catastrophic outcomes at the individual- and/or community-level.

2. SCE's Proposed Tranching Methodology

SCE evaluated using the Quintile Approach to tranche Cyber risk but determined that this method may not be appropriate for this risk. The rationale for this conclusion is outlined below.

The Quintile Approach does not represent the way in which Cyber risk is managed. Cyber risks are not managed at the individual laptop, workstation, user, or server level. Instead, these risks are managed across integrated systems and broad technology domains that reflect likely threat vectors.

In SCE's 2022 RAMP, Cyber risk was segmented into three primary tranches, which are broadly representative of practical risk exposure and operational criticality. These tranches included:

- **Bulk Electric System (BES)** – Transmission and generation environments critical to grid stability.
- **Distribution Grid** – Operational systems supporting energy delivery to end users.
- **Admin** – Corporate and administrative systems supporting business functions.

In its forthcoming 2026 RAMP filing, SCE anticipates proposing the addition of two additional tranches and combining BES (Transmission & Generation) and Distribution into a single tranche, to better reflect a more advanced understanding of how cybersecurity threats are managed, including the application of mitigations and controls across organizational units, technology stacks, and business processes. SCE's proposed new tranches are displayed below in Table I-3.

Table I-3
SCE's Proposed Cyber Tranche Descriptions

#	Name	Description
1	Admin	Network environment and infrastructure supporting SCE's internal business operations (e.g., HR, Finance, Email, Collaboration tools).
2	Grid	Network environment and infrastructure used for all utility operations, including Transmission, Distribution, and Generation, with special attention to SCADA and grid control systems.
3	Third Parties	Personnel from external organizations that provide goods or services to SCE, often with logical access to systems or sensitive information.
4	Employees	Employees, particularly those with access credentials and system-level permissions, representing a key vector for phishing, credential theft, and insider risk
5	Applications	Software used to operate the business, including Commercial-Off-The-Shelf (COTS), custom-built, cloud-based, and on-premises systems. These are categorized based on criticality and function.

E. Hydro Risk

1. Risk Description

SCE defines Hydro risk as the Uncontrolled Rapid Release of Water (URRW) from any of the hydro dams within its portfolio with a hazard classification of "significant-hazard" or greater, as designated by the California Department of Water Resources Division of Safety of Dams (DSOD) and/or the Federal Energy Regulatory Commission (FERC).[9]

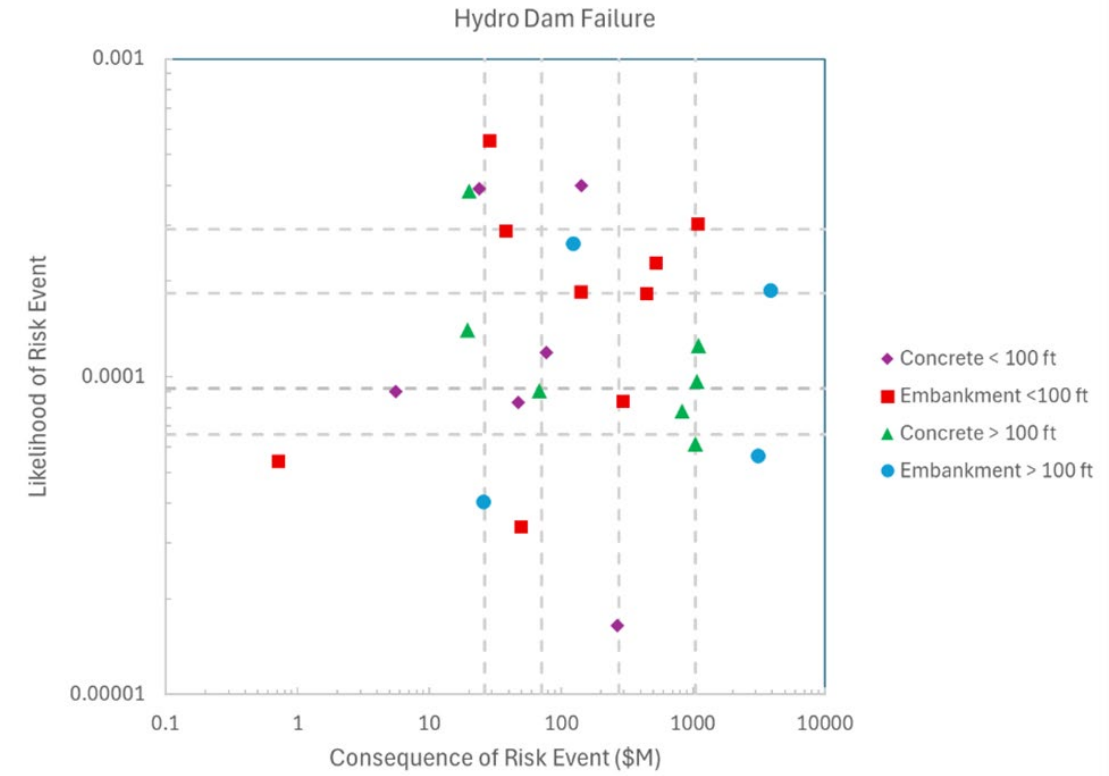
[9] Hazard classification is based on potential downstream impacts to life and property should the dam fail when operating with a full reservoir, as defined in the Federal Guidelines for Inundation Mapping of Flood Risk Associated with Dam Incidents and Failures (FEMA P-946, July 2013). A classification of "High" is given for a dam where one or more fatalities would be expected. DSOD created an "Extremely High" category in 2017 to identify dams that are expected to cause considerable loss of human life or result in an inundation area with a population of 1,000 persons or more. Eight of SCE's 26 high-hazard dams are classified as Extremely High-Hazard.

2. SCE's Proposed Tranching Methodology

SCE evaluated using the Quintile Approach to tranche Hydro risk but determined that this method may not be appropriate for this risk. The rationale for this conclusion is outlined below.

SCE currently has 26 dams classified as having high or significant hazard potential within its current portfolio. While it is possible to group two or more dams in a single quintile using the recommended Quintile Approach, the dams themselves do not share homogenous risk profiles. The dams may vary greatly in location, size, height, and construction material. Therefore, the mitigations and controls for individual dams that are within the same tranche, will likely be unique to the individual dams. To illustrate this point, SCE plotted the LoRE and CoRE for each dam in its portfolio using the Quintile Approach (see Figure I-1 below).

Figure I-1
LoRE and CoRE for SCE Dams Classified as Having High or Significant Hazard Potential[10]



As each dam is evaluated, controls and mitigations are proposed and implemented which are tailored to address specific conditions unique to each dam. Therefore, SCE believes it would be more effective to treat each of the limited number of dams in its portfolio as a separate tranche – 26 tranches, instead of the default 25 tranches. The proposed tranching approach is consistent with SCE's risk management practices and still meets the Commission objective to balance granularity and understandability in tranche granularity.

[10] For presentation purposes, these assets are presented on a log-log scale. The dashed lines indicate boundaries between LoRE and CoRE quintiles.

F. Seismic

1. Risk Description:

SCE defines Seismic risk as the potential for earthquake-induced damage to its critical infrastructure, including substations, transmission lines, and other essential assets. SCE manages this risk through its Seismic Resiliency Program. The goals for that program are to:

- Reduce the potential for loss of life and serious injuries at SCE facilities;
- Reduce the potential for human suffering that might otherwise result from either building collapse or other damage to critical facilities or infrastructure that might otherwise result in reduced electric service reliability; and,
- Reduce direct financial impacts such as repair or reconstruction costs of SCE facilities.

2. SCE's Proposed Tranching Methodology

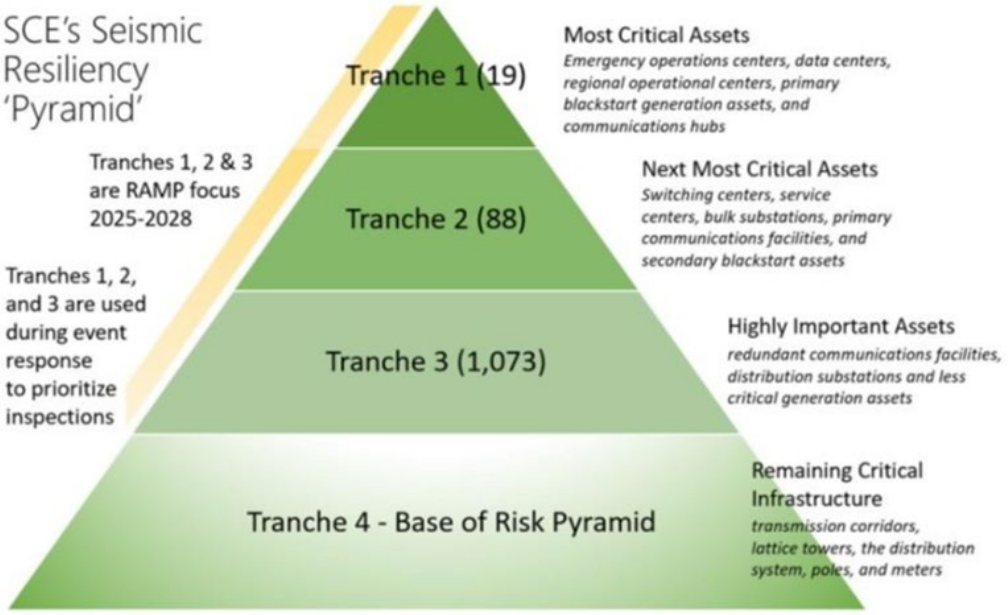
SCE evaluated using the Quintile Approach to tranche Seismic risk but determined that this method may not be appropriate for this risk. The rationale for this conclusion is outlined below.

SCE believes that the required Quintile Approach is not appropriate given both the diversity, complexity, and varying granularity of SCE assets managed under this risk. First, SCE manages seismic risk based on both the structural and non-structural components within a facility. For example, a single data center may contain a computer rack hosting many critical applications, each supporting different stakeholder groups. Therefore, seismic risk management needs to consider the mitigations and controls for the building and its contents separately. Second, the buildings and assets within SCE's Seismic Resilience Plan are already managed using a more appropriate level of granularity – one that reflects the complexity and diversity of the infrastructure. This existing framework provides a more accurate and operationally aligned basis for tranching than the Quintile Approach.

In its 2022 RAMP SCE utilized its Seismic Resiliency Pyramid to tranche buildings and assets into four tranches based on the way in which they are managed. This tranching methodology

helps ensure that the most critical infrastructure is prioritized for mitigation. In sum, SCE proposes to continue using this tranching methodology, as it already allows for transparent and clear communication at the appropriate level of granularity for each building and/or asset class. Each tranche presented in Figure I-2 represents these levels of priority.

Figure I-2
Alternative Tranching Method is the Seismic Resiliency Pyramid (from SCE 2022 RAMP)



G. Major Physical Security

1. Risk Description:

SCE defines Major Physical Security Risk as the compromise of SCE's physical security or targeted attacks on personnel, which may result in workplace violence, theft, damage to assets or equipment, or loss of operational control. SCE evaluates major physical security risk through analyzing associated drivers, such as security system bypass/breach, human/process failure, security system failure, as well as insider and outsider threats.

2. SCE's Proposed Tranching Methodology

SCE evaluated using the Quintile Approach to tranche the Major Physical Security risk but determined that this method may not be appropriate for this risk. The rationale for this conclusion is outlined below.

The Quintile Approach does not adequately account for the diversity, complexity, and varying granularity of SCE assets managed under this risk. SCE categorizes its facilities into tiers based on their criticality and specific building types, such as data centers, substations, and office buildings. This tiered approach allows for a more comprehensive assessment of risk, considering not only the importance of the facility to the company's operations, but also the specific types of controls and mitigations appropriate to its risk profile.

SCE's proposed tranching approach for Major Physical Security Risk builds upon the approach SCE presented it is 2022 RAMP approach. For the 2026 RAMP, SCE introduces an additional level of granularity by subdividing the previous Transmission and Generation tranches. This refinement better reflects the distinct risk profiles of those facilities and aligns more closely with SCE's existing risk mitigation framework and prioritization strategy. The five tranches SCE proposes for the 2026 RAMP are outlined below in Table I-4 :

Table I-4
SCE's Proposed Physical Security Tranches

Tranche	Tranche Description
Transmission (Tier 1-3)	Covers critical transmission facilities within SCE's territory, focusing on grid protection.
Transmission (Tier 4-5)	Covers lower tier (4 and 5) for transmission and distribution facilities within SCE's territory, focusing on grid protection. These facilities are less impactful (in terms of potential consequences) to the grid than Tiers 1 – 3.
Major Business Function	Non-electrical sites such as service centers, call centers, general offices, control rooms, warehouses, and data centers
Generation (Hydro)	Incidents at dams and powerhouses
Generation (General)	Covers incidents that may occur at non-Hydro utility-owned generation facilities (e.g., battery storage and peaker plants).

H. Public Contact with Intact Energized Equipment

1. Risk Description

SCE's Public Contact with Intact Energized Equipment risk is comprised of several distinct sub-risks, including Vehicle Hit Pole, 3rd Party Dig-Ins, 3rd Party Elevated Worker, and 3rd Party Aircraft Wire Strike (see Table I-5, below)

SCE evaluated using the Quintile Approach to tranche each of these individual sub-risks. While we believe it may be beneficial to use the recommended approach for the Vehicle Hit Pole sub-risk, we believe that this approach may not be appropriate for any of the other sub-risks for several reasons. These reasons include the following: a) the unique characteristics of each sub-risk; b) lack of sufficiently granular data to meaningfully inform a 5x5 Quintile Approach; and c) the misalignment between the Quintile Approach and the way in which the sub-risk is managed and/or mitigation strategies employed. Additional details for individual sub-risks are included in the following sections.

Table I-5
List of Public Contact with Intact Equipment Sub-Risks

Sub-Risk	Description
Vehicle Hit Pole	5 x 5 Quintile Approach
3rd Party Dig-Ins	System Level
3rd Party Elevated Worker	System Level
3rd Party Aircraft Wire Strike	System Level

2. 3rd Party Dig-Ins

SCE defines 3rd Party Dig-In as human contact with energized underground equipment by a 3rd party (not an SCE employee or contractor) including construction and other excavation activities regardless of equipment used. SCE believes that the Quintile Approach method is not appropriate for 3rd Party Dig-In risk tranching for the following reasons:

- **Lack of Granular Data**: Dig-in incidents are relatively infrequent[11] and result in only a handful of serious injuries per year on average.[12] SCE continues to improve the quality of dig-in data reporting and root cause analysis. However, the current dataset lacks the granularity required to meaningfully populate a 5x5 matrix, especially given that many of our assets have not experienced a dig-in incident.
- **Consistency with Peer Approaches**: A single tranche approach is consistent with the way that PG&E's 2024 RAMP utilized a single tranche of "Electric Distribution Underground Assets" (which includes dig-ins) within their Public Contact with Intact Energized Electrical Equipment (PCEEE) risk chapter.[13]
- **Alignment with Operations and Mitigation Strategies**: Currently planned mitigations for preventing dig-ins include widespread public awareness campaigns as well as programs, specifically Dig Alert. These mitigations are implemented at a system level and not targeted to specific locations. Thus, providing more granular tranches (compared to a system level) would lack differentiation in mitigation impact and SCE believes would not provide additional value to parties in their review of these mitigations. Tracking, reporting, and mitigation deployment for dig-ins are currently managed at the system level, consistent with this tranching approach. Future improvements to the data may help SCE to better understand different drivers of dig-ins that could inform a more targeted mitigation approach, but these special targeted cases are difficult to predict and will need to be handled as they arise.

SCE believes that for the reasons above it is more appropriate to provide system-level analyses for 3rd Party Dig-Ins.

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[11] SCE averaged 232 per year from 2020 – 2024.

[12] 1.8 serious injuries per year on average between 2020-2024.

[13] A.24-05-008, pp. 3 – 5 in the PCEEE RAMP Chapter

3. 3rd Party Elevated Worker

3rd Party Elevated Worker is defined as human contact with overhead energized equipment by a 3rd party (not an SCE employee or contractor) while performing elevated work (including tree trimming, window washing, solar panel maintenance, construction, etc.). SCE believes that the CPUC Quintile Approach is not appropriate for 3rd Party Elevated Worker risk tranching for the following reasons:

- **Lack of Granular Data**: SCE's data on 3rd Party Elevated Worker incidents is constrained to incidents where an injury to a member of the public occurred, and there are limited numbers of these events reported yearly.[14] This limited data size combined with the variety of conditions and activities that might lead to 3rd party elevated worker contact restrict our ability to meaningfully populate a 5x5 matrix for this risk.
- **Consistency With Previous Approaches**: A single tranche approach is consistent with the way that PG&E's 2024 RAMP utilized a single tranche of "Electric Distribution Overhead Assets" within their Public Contact with Intact Energized Electrical Equipment (PCEEE) risk chapter.[15] This is also consistent with the approach in SCE's 2022 RAMP, in which Intact Contact for "At-Risk Workers" was represented as a single tranche.[16]
- **Alignment With Mitigation Strategies**: Current mitigations for 3rd Party Elevated Worker contact with intact include targeted public awareness campaigns, which are conducted system-wide and not necessarily targeted to specific locations. Providing more granular tranches compared to a system level would lack differentiation in mitigation impact since the mitigations are implemented at a system

[14] SCE averaged 18 per year from 2020– 2024.

[15] A.24-05-008, pp. 3 – 5 to 3 -6 in the PCEEE RAMP Chapter.

[16] A.22.05-013, p. 18 of Contact with Energized Equipment RAMP chapter.

level and not targeted to specific locations. If more granular mitigations are implemented in the future, then there may be a need for more granular modeling.

SCE believes that for the reasons above it is more appropriate to provide system level analyses for 3rd Party Elevated Workers.

4. 3rd Party Aircraft Wire Strike

3rd Party Aircraft Wire Strike is defined as 3rd party manned, motorized aircraft (excludes unmanned aircraft and other manned, non-motorized air activities, and flights by SCE or contractor aircraft) contact with overhead transmission lines (energized or de-energized). SCE believes that the CPUC Quintile Approach is not appropriate for 3rd Party Aircraft Wire Stike risk tranching for the following reason:

- **Lack of Granular Data**: SCE lacks the data to differentiate on the consequence axis of a quintile approach. The historical data shows that the consequences of an aviation wire strike are high – a 2010 FAA safety alert noting that around 1 in 3 wire strike events result in a fatality.[17] Moreover, a 2018 FAA analysis of rotorcraft wire-strike accidents (1966-2018) found that roughly one-third of people involved in those accidents did not survive, and around 20% of those involved reported serious injuries.[18] However, these studies do not offer insights that would inform a method to distinguish consequences across wire assets. In addition, the low frequency of these events in SCE territory[19] limits our ability to meaningfully disaggregate the likelihood and consequences into a five-level tranche structure.

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[17] Flying in the Wire Environment, https://www.faa.gov/sites/faa.gov/files/other_visit/aviation_industry/airline_operators/airline_safety/SAFO10015.pdf

[18] Rotorcraft Wire Strike Data, https://rosap.ntl.bts.gov/view/dot/57769

[19] SCE averages 0.9 per year from 2015 – 2024. However, with the upcoming Olympics the risk exposure may increase in the future.

SCE believes that for the reasons above it is more appropriate to provide system-level analyses for 3rd Party Aircraft Wire Strike. There may be an opportunity for the likelihood and consequence dimension to be expanded in the future; SCE will continue to investigate, and plans to provide any relevant updates in our RAMP and/or GRC.

II.

CONCLUSION

Consistent with Commission guidance, SCE respectfully submits this White Paper to present its alternative approach to tranching risks for our respective upcoming 2026 RAMP report and additionally will be presenting this methodology at our upcoming pre-RAMP workshop, where SCE will also present our preliminary RAMP risks. As discussed in this White Paper, SCE is proposing to implement the Quintile Approach for several of our most important risks including, but not limited to, Wildfire and PSPS. For certain other proposed RAMP risks, SCE believes that the Quintile Approach is not appropriate and proposes alternative tranching proposals that we believe:

- Are driven by data;
- Provide appropriate transparency and granularity;
- Attempt to establish meaningful LoRE and/or CoRE distinctions between tranches as appropriate; and
- Align with and inform risk mitigation efforts in a manner compatible with SCE's existing and prospective operating procedures.

SCE is continuing to assess and analyze risks as we prepare our upcoming 2026 RAMP report. Thus, these proposals are subject to change, especially in light of the new requirements springing from the Risk OIR Phase IV Decision.[20]

[20] D.25-08-032.