Southern California Edison Company
Post-Filing RAMP Workshop

June 30, 2022

Agenda

Topic	Presenter	Time
Safety Policy Division Opening Remarks	Safety Policy Division	10:30 – 10:40
Safety Moment	Dan Komula	10:40 – 10:45
SCE Opening Remarks	Robert LeMoine	10:45 – 10:50
RAMP Overview and Chapters/Appendices	Kris Vyas	10:50 – 11:20
Discussion on MAVF and Risk Quantification	Gary Cheng	11:20 – 11:50
RAMP Regulatory Requirements	Dan Komula	11:50 – 11:55
RAMP Workpapers and Data Request Process	Dan Komula	11:55 – 12:15
Lunch Break	-	12:15 – 1:00
Wildfire and PSPS Risk Overview	Rajdeep Roy and Kyle Ferree	1:00 – 3:00
Break	-	3:00 – 3:15
Employee Safety Risk Overview	Todd Gallaher	3:15 – 3:45
Treatment of Climate Change in RAMP	Kris Vyas	3:45 – 4:00
Final Q&A / Roundtable	-	4:00 – 4:15
Closing Remarks	Kris Vyas	4:15 – 4:30

Safety Moment - Extreme Heat

- In most of the U.S., extreme heat is a long period (two or more days) of high heat and humidity with temperatures above 90 degrees.

https://www.ready.gov/sites/default/files/2021-01/ready_extreme-heat_info-sheet.pdf

Opening Remarks from Southern California Edison

Robert LeMoine
Director, Enterprise Risk Management & Insurance

RAMP Overview

Kris Vyas
Principal Manager, Regulatory Risk
Enterprise Risk Management

Summary of SCE's RAMP Filing

- The CPUC's Risk Assessment Mitigation Phase (RAMP) is an integral part of SCE's overall risk management process. RAMP focuses on safety risk mitigations and return on risk investment for 2025-2028.

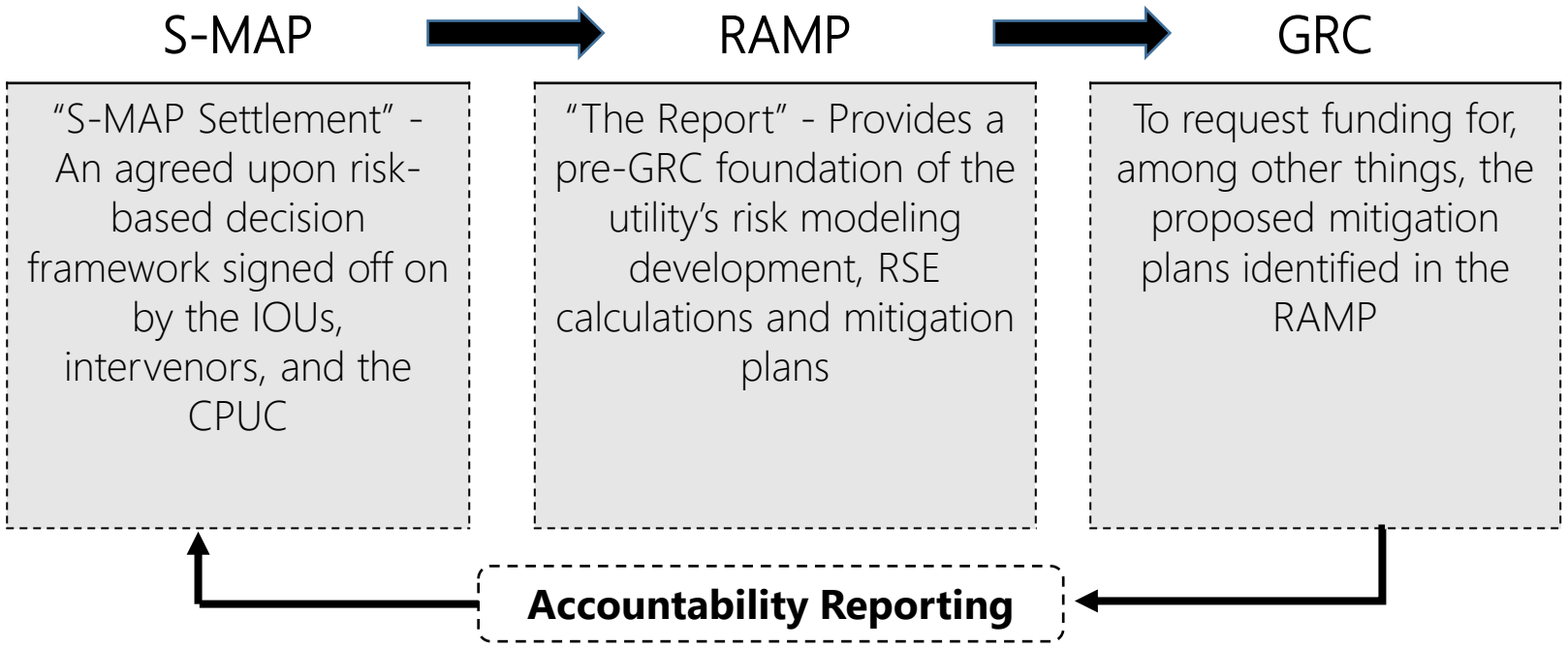
- RAMP is a pre-requisite filing of the General Rate Case (GRC), allowing the CPUC to understand how SCE identifies/mitigates safety risks. SCE filed its RAMP on May 13, 2022 – one year before the GRC filing.

- SCE's RAMP filing:
  - Describes SCE's top safety risks (including Wildfire)
  - Explains how SCE analyzes and prioritizes each risk
  - Evaluates mitigation activities for each risk

- Spending is not authorized during the RAMP phase of the GRC, but RAMP informs the scope and spending for major safety-driven initiatives in the GRC. In the GRC, SCE can update and modify the cost estimates, mitigation selections, and risk analysis and scoring.

Background

- The CPUC modified the GRC process in December 2014 to incorporate a risk-based decision-making framework.
- RAMP shows in detail how key safety risks are identified and prioritized, and how the utility manages and mitigates these risks.
- RAMP must be filed one year before GRC application.
- The RAMP process focuses on developing, reporting, and assessing the risk analysis that will eventually help inform the requested spend and scope in the GRC.



S-MAP = Safety Model Assessment Proceeding

Key New Requirements for SCE's 2022 RAMP Report[1]

- Because of timing, SCE's 2018 RAMP Report was exempted from the S-MAP Settlement Agreement (SA) requirements.
- SCE's 2022 RAMP complies with the new requirements from the SA and the recent decision in the Risk OIR (D.21-11-009).

  - **Risk Spending Efficiency (RSE) Calculations at Tranche Level** – SCE provided RSEs at the tranche level for each RAMP Risk, and included the total lifetime benefits and costs of each control and/or mitigation.

  - **Include Foundational Activities in RSE Calculations:[2]** – For foundational programs that support a portfolio of risk mitigations, SCE included the cost of foundational programs when calculating RSEs of mitigations, if the aggregate cost (over the next GRC period) of the foundational programs exceeds prescribed thresholds. SCE provided the rationale for including the activity as foundational, and explained how the costs were allocated in each RAMP chapter as applicable

  - **Data Transparency Template:[3]** Solely for informational purposes, SCE is "test-driving" PG&E's Transparency Proposal and will provide results within 60 days after the RAMP filing date.

1) This slide is not intended to serve as an exhaustive listing of all new requirements.
2) D.21-11-009, p. 141, OP 1e and 1g
3) D.21-11-009, p. 143, OP 3

RSEs Are One Factor in Making Risk-Informed Decisions

- RSE represents a relative measure of estimated cost-effectiveness for actions a utility takes to mitigate a specific risk .
- But RAMP RSEs are based in part on assumptions and preliminary cost projections, and thus should be viewed as point-in-time approximations one full year in advance of GRC forecasting.
- RSEs are not, and should not be, the only factor used to develop a proposed risk mitigation plan. RSEs do not take into account operational realities, resource constraints, and other critical factors that SCE must consider in developing its mitigation plans.
  - For example, it would not be prudent to implement a comprehensive wildfire risk mitigation plan based solely on RSEs, because this could lead to significant parts of the system and potentially significant risk issues being left unaddressed.
  - Commission's Safety arm has agreed that RSEs are just one factor – please refer, for example, to 2022 RAMP Chapter 1, page 19.

RAMP Safety Risk Chapters and Appendices

Kris Vyas

Safety Risks Included in the 2022 RAMP

Wildfire / PSPS

Ignition associated with SCE's overhead electrical assets and operation

PSPS analyzed as ignition mitigation and as a standalone risk

Contact with Energized Equipment

Human contact with energized equipment potentially causing electrical shock to the public

Underground Equipment Failure

Asset failure which potentially causes uncontrolled release of energy from a vault or manhole

Seismic

SCE's inability to effectively respond and recover from a catastrophic earthquake

Physical Security

Compromise of SCE physical security which potentially leads to workplace violence, property theft, or other consequences

Cyber Attack

Disruption of operations from a cyber attack with the ability to damage systems or interrupt critical business functions

Hydro Dam Failure

Failure of Dam leads to uncontrolled rapid release of water

Employee Safety

Incidents involving SCE employee, potentially exposing workers to hazards

Contractor Safety

Incidents involving SCE contractors, potentially exposing workers to hazards

- **Notes:**
  - RAMP also qualitatively discusses items that cut across multiple RAMP risks (e.g., climate change) or were suggested for inclusion by CPUC staff
  - Seismic is now treated as a standalone risk, rather than as part of overall building safety. Building safety is no longer a standalone risk

RAMP Risk Scores in SCE's 2022 RAMP

SCE RAMP Risk	Baseline* LoRE	Baseline* CoRE	Baseline* Risk Score
Wildfire	32.5	1.5	47.6
Cyber Attack	14.8	0.58	8.61
Seismic	0.17	19	3.2
Contractor Safety	13.05	0.17	2.17
Underground Equipment Failure	1,955	0.001	1.96
CEE – Intact	5.7	0.19	1.09
CEE – Wires Down	1,122	0.001	1.04
Employee Safety	7.8	0.1	1
Physical Security	256,2	0.003	0.71
PSPS	24	0.0068	0.16
Hydro Dam Failure	0.0042	7.4	0.031

** Baseline Risk Scores are at the beginning of the RAMP period, 2025.*

Format of SCE's 2022 RAMP Risk Chapters

- Executive Summary
  - Risk Overview, Risk Definition and Scope, Summary Results
- Risk Assessment
  - Risk Background, Risk Bow Tie, Drivers, Outcomes, Tranches, Related Factors
- Controls
- Mitigations
- Foundational Programs
- Proposed Plan
  - Overview, Execution Feasibility, Affordability, Other Constraints Considered
- Alternative Plans
  - Overview, Execution Feasibility, Affordability, Other Constraints Considered
- Lessons Learned, Data Collection, & Performance Metrics
- Incorporation of Stakeholder Feedback
- Chapter-Specific Appendices (as needed)

Appendices in RAMP Report

- SCE included the following topics as appendices, either because they cut across multiple RAMP risks or have previously been suggested for inclusion through informal feedback from CPUC Staff

Climate Change	Where applicable under RAMP criteria, SCE has integrated its Climate Change Vulnerability Assessment report into the RAMP report
Battery Energy Storage Systems	Discussion of two BESS safety-related risks, as well as our approach to mitigate these risks: (1) thermal propagation risk and (2) Decommissioning
SONGS	Discussion on the updated SONGS risk profile since the 2018 RAMP, and summary of the current state of risks, including dry fuel storage and executing the Dismantling and Decommissioning (D&D) project phase
Transmission Asset Failure/Aging Infrastructure	Discussion on certain potential but direct safety risks associated with transmission lines, sub-transmission lines, and substation assets that are not addressed within SCE's RAMP Risk chapters
Widespread Outage	Discussion of widespread outage impacts to the extent not already covered in other RAMP chapters

Discussion on MAVF and Risk Quantification

Gary Cheng
Senior Advisor, Regulatory Risk
Enterprise Risk Management

MAVF Summary

SCE has developed the following MAVF, consistent with the S-MAP Settlement guidelines:

Attribute	Unit	Weight	Range	Scaling
Safety	Index[1]	50%	0 - 100	Linear
Reliability	CMI	25%	0 – 2 Billion	Linear
Financial	$	25%	0 – 5 Billion	Linear

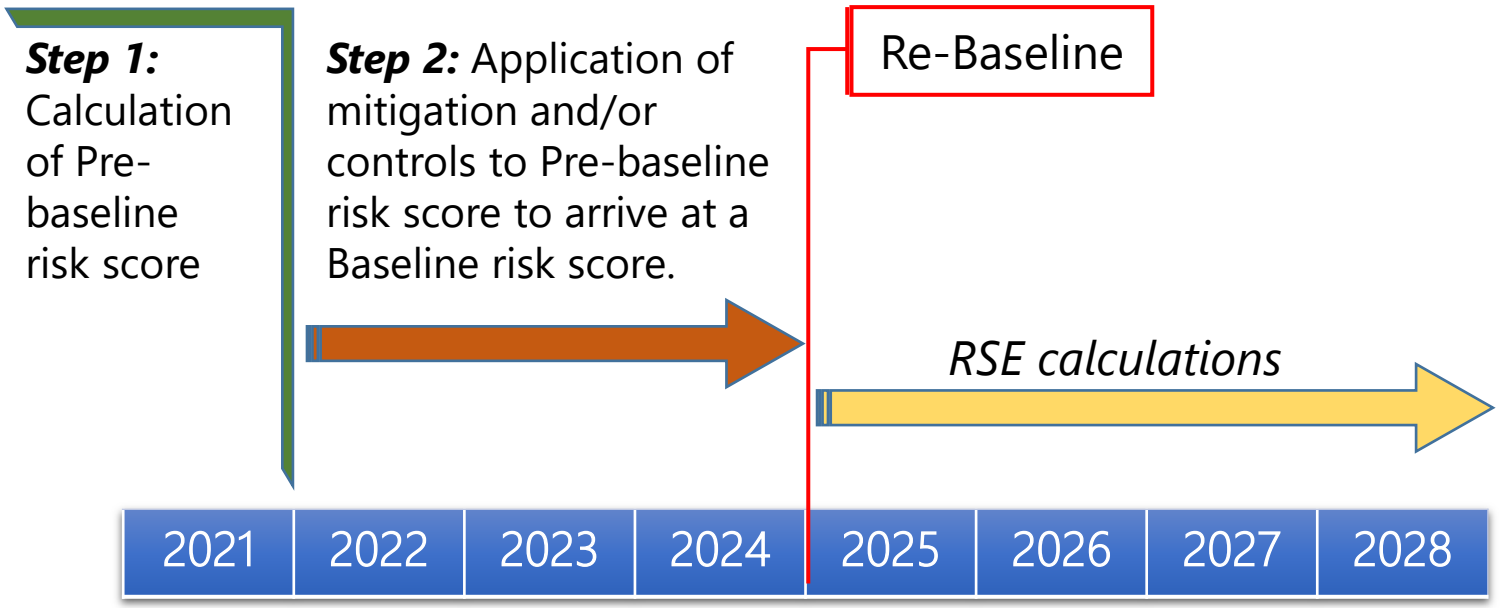
*[1] Safety Index = 1.0 * (# of fatalities) + ¼ * (# of serious injuries)*

- Key change from the previous RAMP filing is a change in the safety scaling function from non-linear to linear (this was previewed and discussed in the 2021 Wildfire Mitigation Plan)
- SCE's safety weighting of 50% meets the minimum threshold of at least 40% as set forth in the S-MAP Settlement
- Weights, ranges, and scaling for Reliability and Financial attributes remain the same as compared to the 2018 RAMP filing

Baseline Risk Methodology

Step 1: Calculate the Pre-Baseline risk score as of the end of 2021. Risk driver frequency and consequences informed by historical data collected over the previous 5 years*

Step 2: Apply mitigations and/or controls, as applicable, to the Pre-Baseline risk score through 2024 to arrive at a Baseline risk score. From this point forward, RSEs are calculated for the mitigations and/or controls proposed during the GRC period



*There may be variances with respect to certain risks where historical data is not available or is not consistent. These variances will be explained within each chapter

Risk Tranching

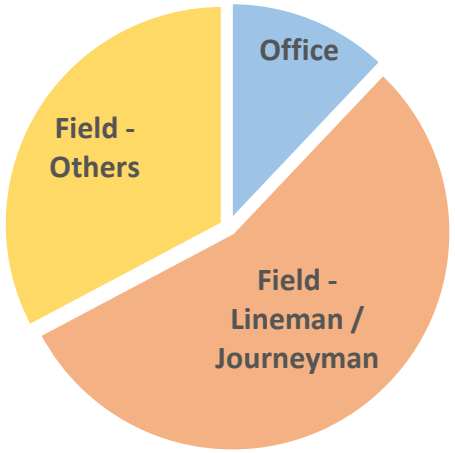
SCE describes the rationale of how tranches were chosen in each chapter.

System Level

One single tranche – system level

Risk scores and mitigation risk spend efficiency were calculated at the system level

2022 RAMP

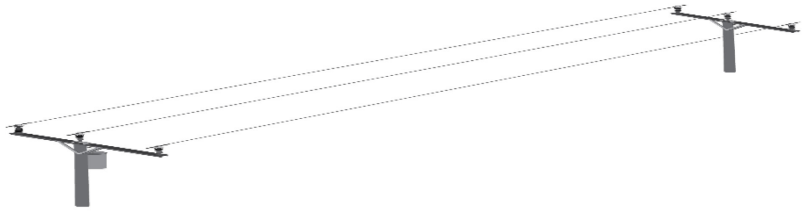


3 tranches– each with a different risk profile

Risk scores and mitigation risk spend efficiency calculated at each tranche

Illustrative RSE Detailed Example – Part I

1 Baseline Risk



LoRE

Risk Driver	Frequency
Driver-A	10
Driver-B	10
Driver-C	20
Driver-D	10
Total	**50**

✖

CoRE

Safety	Reliability	Financial
10 (Safety index)	400,000,000 CMI	$2 Billion
Convert to MARS		
5	5	10
Total MARS		
	20	

Pre-Mitigated Baseline Risk Score = 50 x 20 = 1,000

Illustrative RSE Detailed Example – Part II

2 Mitigation Program

LoRE		Mitigation Program	
Risk Driver	**Frequency**	**Effectiveness**	**Remaining Frequency**
Driver-A	10	**0%**	10
Driver-B	10	**0%**	10
Driver-C	20	**25%**	**15**
Driver-D	10	**50%**	**5**
Total	**50**		**40**

Post-Mitigated Risk Score = 40 x 20 = 800

3 Risk Reduction

Risk Reduction

Pre-Mitigated Risk Score – Post Mitigated Risk Score =
1,000 – 800 = 200

4 RSE

Assume 5 years benefit stream and $5M program cost in Year 0

Y0	Y1	Y2	Y3	Y4	Total
200	194	189	183	178	943

$$\boldsymbol{RSE} = \frac{Discounted\ Benefits}{Discounted\ Cost\ (in\ thousands)} * Readability\ Factor$$

$$\boldsymbol{RSE} = \frac{943}{\$5{,}000} * 10{,}000{,}000 = 1{,}866{,}000$$

RAMP Regulatory Requirements

Dan Komula
Senior Advisor, Regulatory Affairs

SCE's 2022 RAMP Report Meets Compliance Requirements

SCE provided a Workpaper, WP Ch.1 – RAMP Compliance Requirements, that addressed each individual compliance requirement.[1] For each compliance action item, we provided the following information:

- **The Commission decision or Public Utilities Code provision** which resulted in the compliance action item. For example, "D.19-05-020 - Commission's 2018 GRC Decision" refers to SCE's Test Year 2018 General Rate Case decision.
- **Action Required**. This usually consists of a verbatim quote of the applicable language from the decision. In general, if the decision cite includes an Ordering Paragraph, the "Action Required" will only quote such Ordering Paragraph. In some instances, other decision language will be quoted if we believe it is helpful in clarifying the Action Required.
- **Decision Reference.** This indicates where in the Commission decision the identified compliance action may be found. The Decision Reference may refer to any combination of Ordering Paragraph, Conclusion of Law, Finding of Fact, or Discussion pages.
- **Proof of Compliance**. A brief summary is provided regarding the proof of compliance of any compliance action items, and/or a reference to SCE's RAMP chapters or workpapers pointing to where a particular item is addressed.

1) We identified compliance action items by reviewing the provisions of the Settlement that the Commission approved in the S-MAP. We also re-examined Ordering Paragraphs, Conclusions of Law, Findings of Fact, and other guidance found in Commission decisions in RAMP proceedings.

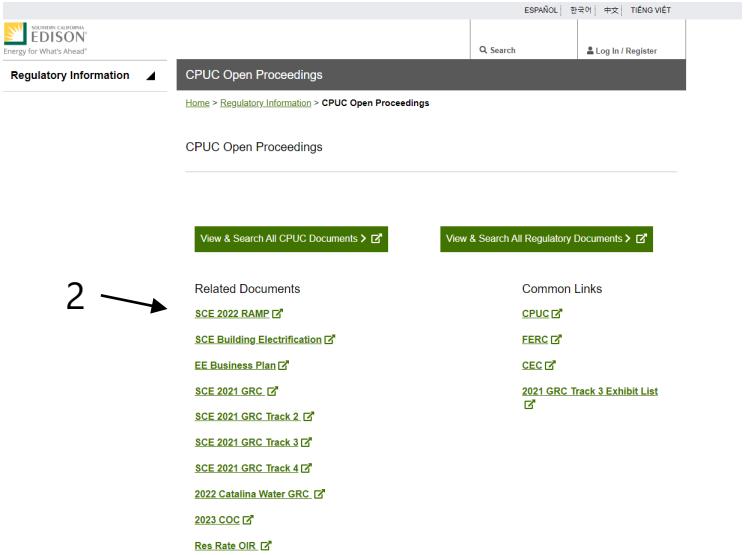
RAMP Workpapers and Data Request Process

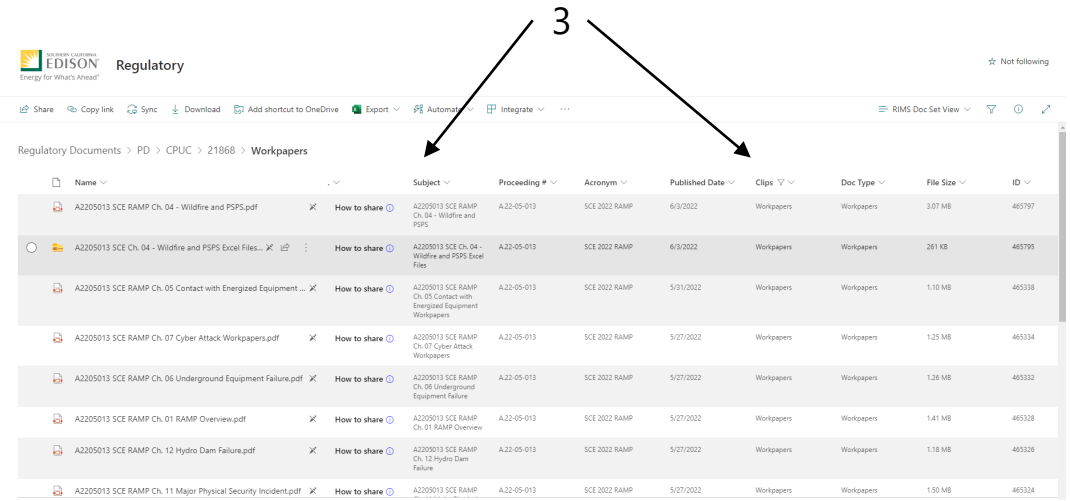
Dan Komula

Availability of SCE's 2022 RAMP Workpapers

SCE'S Published documents are available online

1. Go to www.sce.com/applications
2. Locate the "SCE 2022 RAMP" link and click on it.
3. Click on the "Subject" column to sort; or the "Clip" column and filter to Workpapers.
4. The Workpapers are presented in Adobe Acrobat (pdf) format and supporting excels can be viewed online, printed, or saved to your hard drive.





SCE RAMP Risk Chapter Workpapers

Excel Based Risk Models:

- Risk Baseline and Risk Inputs – Includes the driver frequencies, outcome percentages, mitigation effectiveness values and useful life assumptions and rationale.
- The Excel Based Risk Models – SCE provided the excel based risk models for the Proposed and Alternative Plans that includes a user guide.
- Financials and Work Units – Financial and work unit forecasts where applicable.
- Supplemental Workpapers as applicable.

Machine Learning Risk Models – (WF / PSPS, CEE and UEF):

- For risks where Excel is not a feasible solution to handle the complexities and the level of granularity required to calculate RSEs at the tranche level, SCE provided a summary overview of the model used to calculate the RSE. This included a discussion on the methodology used to estimate the probability and consequences for those risks.
- Risk Baseline and Risk Inputs – Includes the driver frequencies, outcome percentages, mitigation effectiveness values and useful life assumptions and rationale.
- Financials and Work Units– Financial and work unit forecasts where applicable.
- Supplemental Workpapers as applicable.

SCE RAMP Risk Chapter Workpapers

- Compliant with the Settlement Agreement, SCE provided a ranking of all RAMP mitigations by RSE's by in WP Ch. 2 – RSE Summaries.zip.
- SCE is aware that parties have had challenges opening and manipulating this file due to the size. The file contains over 5 million rows as a result of providing circuit segment-level RSEs for Wildfire, circuit level for PSPS and structure or segment level for Contact with Energized Equipment and Underground Equipment Failure.
- Below is a link that walks through how to open this file in Microsoft Excel, so that parties can create pivot tables.

What to do if a data set is too large for the Excel grid (microsoft.com)

- SCE is also in the process of creating smaller files by risk for parties; however, the Wildfire risk may need to be further divided by scenario and years as well.

SCE RAMP Data Requests

Where to Send Data Requests?

Please send all data requests to scegrc@sce.com.

Where to Access Data Requests?

RAMP Data Request Publishing Site:

SCE created an external publishing site for non-confidential 2022 RAMP Data Request responses and attachments, please send access requests to scegrc@sce.com.

Should you have any difficulty accessing the documents please contact scegrc@sce.com.

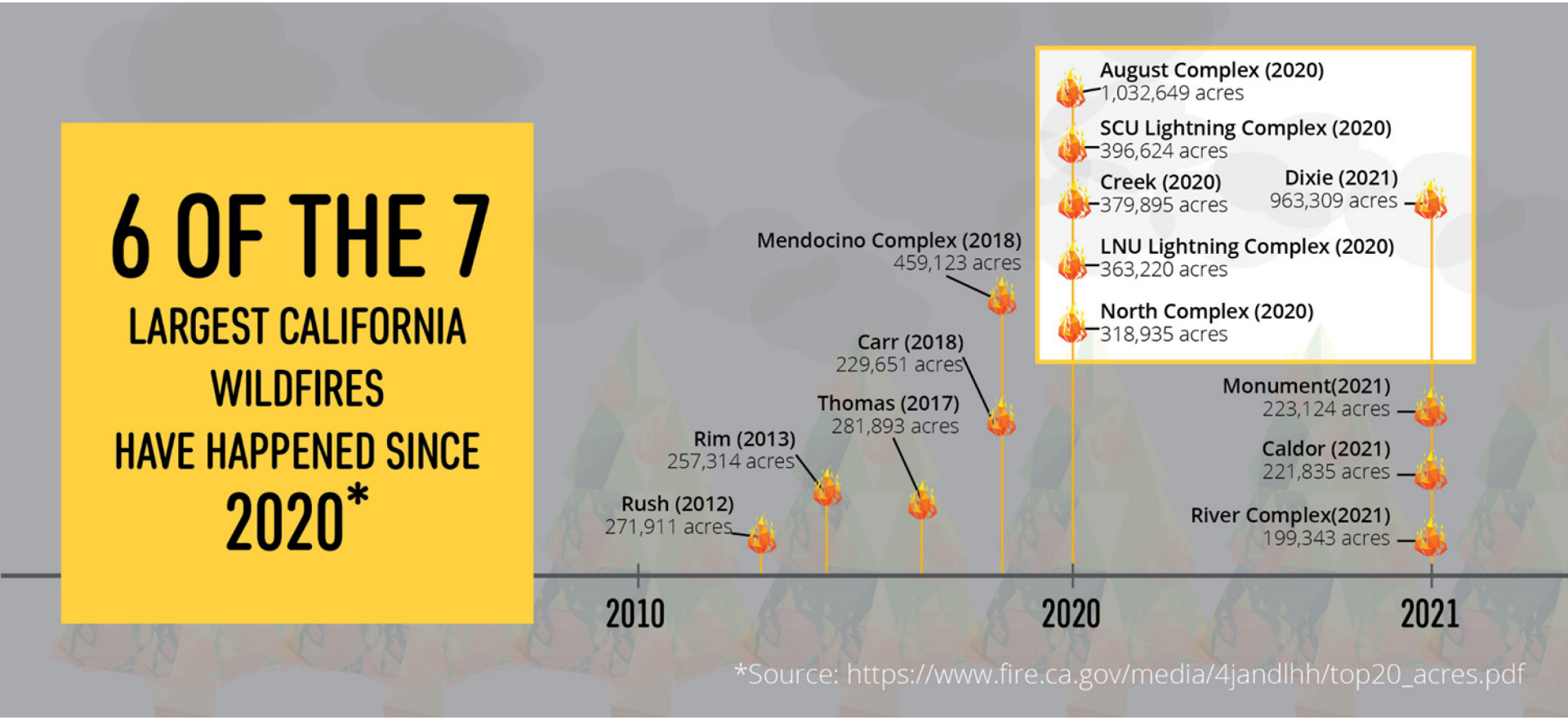
Lunch Break

Wildfire RAMP Overview

Rajdeep Roy
Director Wildfire Safety, Asset Strategy & Planning

Wildfire Risk Introduction

As part of the 2022 RAMP, SCE assessed wildfire risk in HFRA. We quantified the potential safety, reliability, and financial impacts resulting from this risk.



Wildfire Risk Introduction

SCE SERVICE AREA & HIGH FIRE RISK AREAS

50,000 SQ. MI.
of SCE service area across southern, central and coastal California

14,000 SQ. MI.
of high fire risk areas

52,000 MI.
of SCE overhead distribution and transmission lines

14,000 MI.
in high fire risk areas

5M
customer accounts or 15M residents in SCE's service area

1.3M
customer accounts or 3.9M residents served by circuits in high fire risk areas

1.4M
power poles

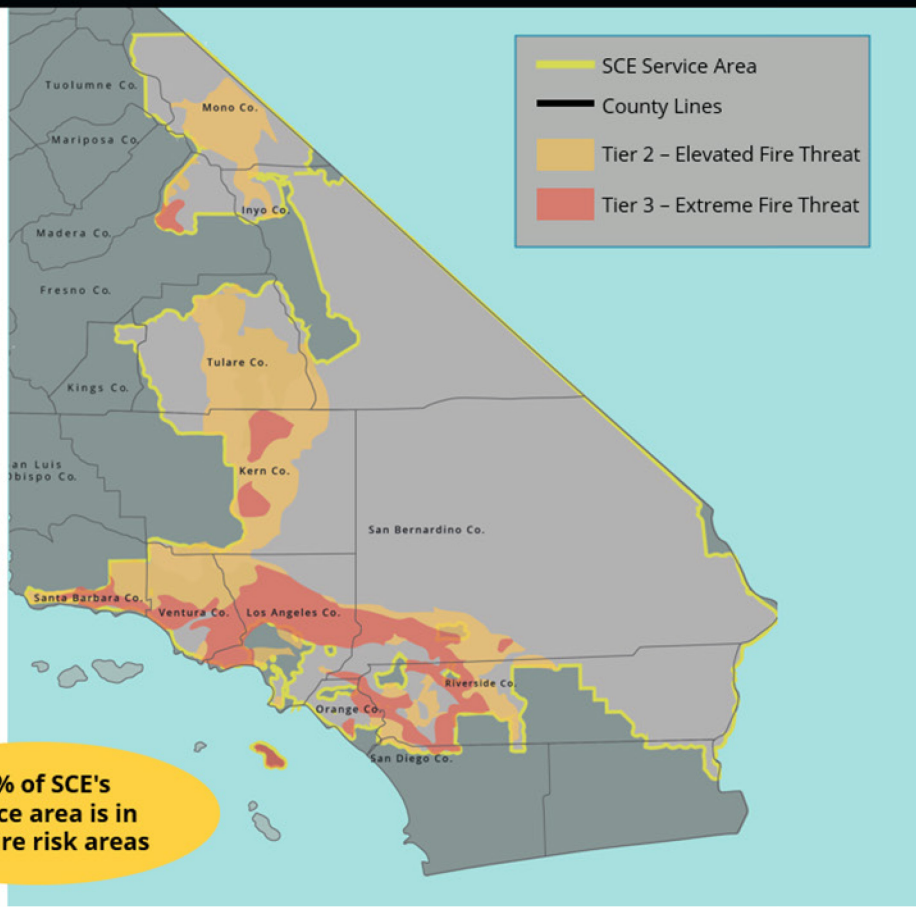
300,000
in high fire risk areas

Counties with high fire risk area served by SCE

Fresno
Inyo
Kern
Los Angeles
Mono
Orange
Riverside
San Bernardino
Santa Barbara
Tulare
Ventura

Counties with no or limited high fire risk areas served by SCE

Imperial
Kings
Madera
Tuolumne



27% of SCE's service area is in high fire risk areas

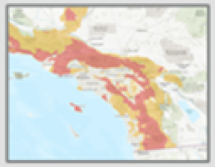
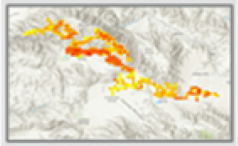
Summary of SCE's Wildfire Proposed Plan

- SCE's Proposed Plan addresses wildfire risk while also balancing cost, execution feasibility, and technology advancements through the 2025-2028 GRC period.
- Risk modeling advancements used in SCE's Integrated Grid Hardening incorporate a highly granular, data-driven, and multi-factor risk assessment framework.

Grid Design & System Hardening	Asset Management & Inspections	Vegetation Management	Alternative Technologies	Foundational
• Wildfire Covered Conductor Program • Fire Resistant Poles • Targeted Undergrounding • Branch Line (Fuses) • Remote Controlled Automatic Reclosers Settings (RAR/RCS) • Tree Attachment Remediation • Aerial Suppression • Vibration Damper Retrofit	• Distribution Ground Inspections • Distribution Aerial Inspections • Transmission Ground Inspections • Transmission Aerial Inspections • Distribution Infrared Inspections • Transmission Infrared Inspections	• Hazard Tree Mitigation Program • Expanded Pole Brushing • Dead and Dying Tree Removal Program • Expanded Line Clearing	• Rapid Earth Fault Current Limiter (REFCL) • Distribution Open Phase Detection (DOPD) • Early Fault Detection (EFD) • High Impedance (Hi-Z) Relays	• Inspection Wildfire Management (WM) Tools • Wildfire Safety Data Mart and Portal (WiSDM) • Ezy • Arbora

Evolution of SCE's Wildfire and PSPS Risk Modeling

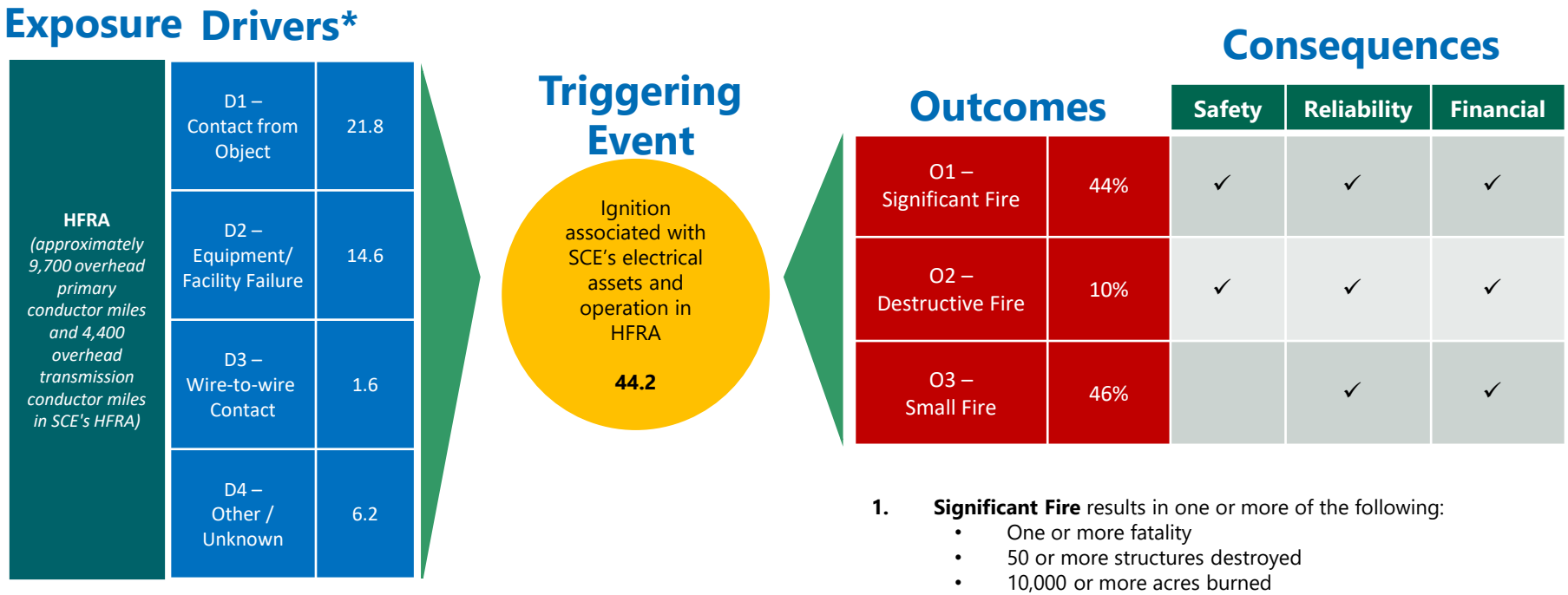
In preliminarily approving SCE's 2022 WMP Update earlier this month, the Office of Energy Infrastructure Safety noted that "[s]ince its 2021 [WMP] Update, SCE has improved its grid design and system hardening" work, including by "focus[ing] on the highest-risk miles identified through its risk modeling efforts."[1]

2018 GSRP	SMAP / RAMP	2019 WMP	2021 GRC Track 1	2020-2022 WMP	2021 WMP Update	2022 WMP Update/ 2021 GRC Track 4/ 2022 RAMP
• Fault-to-Fire Mapping • Mitigation-to-Fault Mapping • Mitigation Effectiveness / Cost Mitigation Ratios • High Fire Risk Area (HFRA) Definition	*System-wide* • Bowtie (Drivers, Outcomes, and Consequences) • Multi Attribute Risk Score (MARS) • Mitigation Risk Spend Efficiency (RSE)		*Circuit and Circuit Segment Level* • Asset risk prioritization to inform mitigation deployment • Probability of Ignition for Distribution assets • REAX Fire Propagation Algorithm	Fire Incident Analysis (FIPA) • Enhanced Mitigations and Tranching • RSE Calculation Enhancement • Began transition to Technosylva Fire Propagation Algorithm	• Probability of Ignition for Transmission and Sub transmission assets • Inclusion of PSPS reduction to circuit prioritization • PSPS Risk Modeling	• Fire Propagation refinements • Updated fuels model • 400+ additional wind & weather scenarios • Severe Risk Area Methodology • Granular PSPS Risk Modeling
					*Wildfire + PSPS Risk*	

1) June 2, 2022 Draft Decision of the Office of Energy Infrastructure Safety (Energy Safety) presenting its evaluation of Southern California Edison Company's 2022 Wildfire Mitigation Plan (WMP) Update, p. 50.

Wildfire Risk Bowtie

Risk Definition: SCE defines a wildfire risk event as an "ignition associated with SCE's overhead electrical assets and operation in its HFRA."



1. **Significant Fire** results in one or more of the following:
   - One or more fatality
   - 50 or more structures destroyed
   - 10,000 or more acres burned
2. **Destructive Fire** results in:
   - No fatality and either one of the following:
   - <50 structures destroyed
   - 300<acres burned<10,000
3. **Small Fire** results in all of the following:
   - No fatality
   - No structures
   - Acres burned <= 300

**The data is an average of 2017 – 2021 internal SCE data.*

Summary of SCE's Approach to Wildfire Risk Modeling for the 2022 RAMP

Baseline Risk	Consistent with D.21.11-009, SCEs baseline risk was 2025. SCE included the risk reduction for planned work from 2022 – 2024 to develop the 2025 baseline wildfire risk.
Controls and Mitigations	SCE modeled and provided RSEs for all 21 controls and 7 mitigations as part of the Proposed Wildfire Plan.
Tranching and Risk Spend Efficiencies (RSEs)	SCE classified fires simulated along each circuit segment within SCE HFRA into a series of outcomes. The analysis allowed SCE to tranche wildfire risk to every single circuit segment. SCE provide RSEs at the circuit segment or structure level for all assets in SCE HFRA in our Workpapers. However, for ease of reference and clarity of presentation in the RAMP chapter, and in alignment with our Integrated Grid Hardening Strategy, SCE bundled these tranches into three broad groupings: Severe Risk Areas, High Consequence Segments, and Other HFRA.
Treatment of Foundational Activities	Consistent with D.21.11-009, SCE included the foundational activity costs in the RSEs of the controls and/or mitigations that they directly support. SCE identified 4 foundational activities supporting Wildfire mitigation efforts.

SCE's Integrated Grid Hardening Strategy Informs RAMP Tranche Groups

	Risk Designation	Risk Criteria
Total High Fire Risk Area (HFRA) Overhead Distribution Segments	**Severe Risk Areas** (~2,275 circuit miles)[1]	Fire risk egress-constrained locations, extreme high wind areas, and extreme consequence areas
	High Consequence Segments (~4,675 circuit miles)	Locations that meet 300-acre consequence threshold at 8 hours or at risk of Public Safety Power Shutoff (PSPS)
	Other HFRA Segments (~2,750 circuit miles)[2]	Locations that are not in a Severe Risk Area and do not meet High Consequence criteria

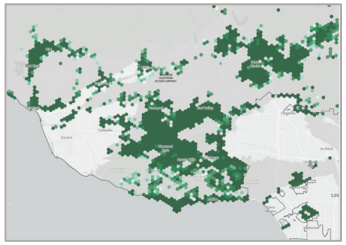
	Pre-Mitigation Risk Quantification Scores - (End of 2024)			Post-Mitigation Risk Quantification Scores - (End of 2028)		
	LoRE	**CoRE**	**Risk Score**	**LoRE**	**CoRE**	**Risk Score**
Wildfire - All HFRA	32.5	1.5	47.6	27.3	1.4	39.6
T1 - Severe Risk Areas	4.3	3.6	15.4	2.7	4.5	12.2
T2 - High Consequence Segments	13.5	2.2	29.3	10.9	2.3	24.7
T3 - Other HFRA	14.8	0.2	2.9	13.8	0.2	2.7

[1]Based on initial feasibility analysis of ~2,275 circuit miles, several hundred miles currently under consideration for additional enhanced mitigation, including undergrounding

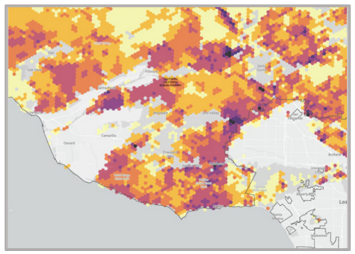
[2]Some of these are "buffer" miles that may be proactively replaced with covered conductor due to operational realities

Assessment of Risk Factors & Potential Mitigations In Severe Risk Areas

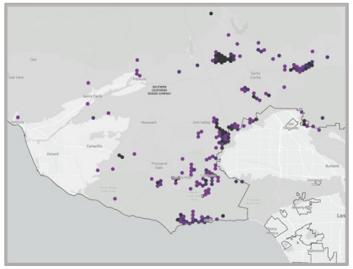
Egress-Constrained Locations



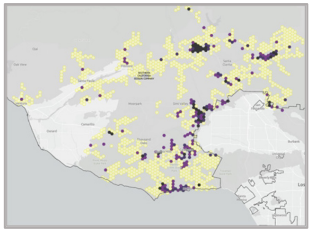
Locations with High Historical Fire Frequency



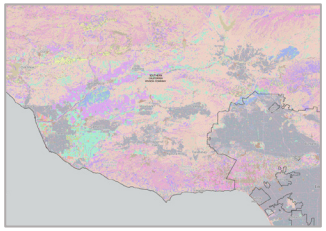
Highest Ranked Egress Constrained/ Fire Frequency Locations



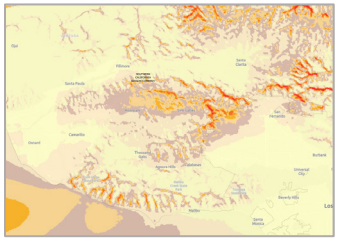
Burn in Buffers using WRRM risk factors (acres and wind speed)



Locations which are likely to exceed de-energization thresholds even with CC fully deployed

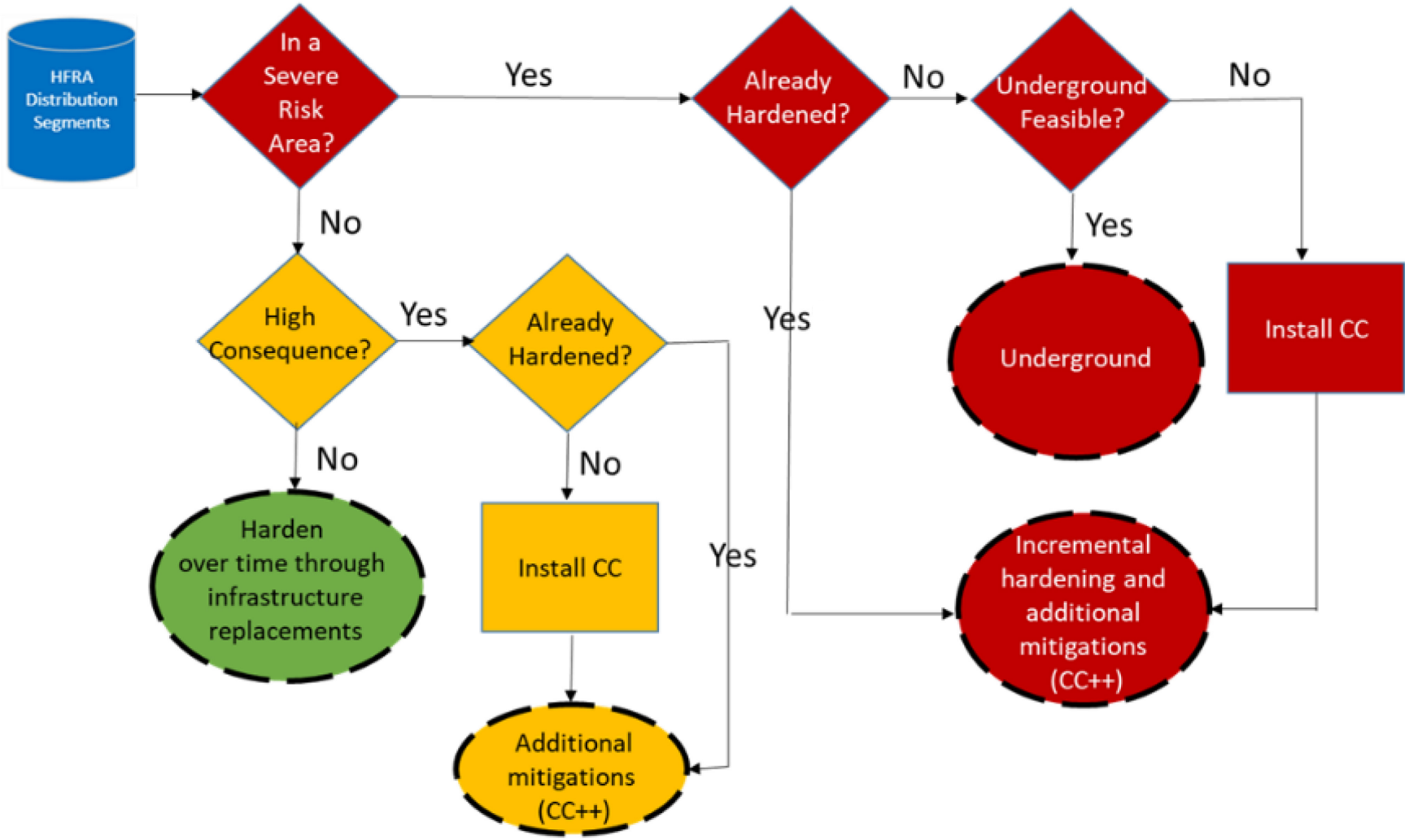


High Standard Consequence (>10,000 acres) Areas



Severe Risk Areas

SCE's Integrated Grid Hardening Strategy



Public Safety Power Shutoff (PSPS)
RAMP Overview

Kyle Ferree
Senior Advisor, PSPS Readiness

Public Safety Power Shutoff (PSPS) Risk Introduction

As part of the 2022 RAMP, SCE assessed the PSPS risk in HFRA. We quantified the potential safety, reliability, and financial impacts resulting from this risk.

- Similar to the Wildfire Risk, SCE outlined our plans to reduce the need for PSPS, as well as lessen the impact of PSPS on customers and communities. SCE continues to align with the Commission that PSPS is a measure of last resort, and SCE recognizes the impacts that these events have on the customers and communities that we are privileged to serve.
- SCE uses PSPS as a measure of last resort, when elevated fire potential index (FPI) and windspeeds combine to present serious risk of wildfire.
- Currently, SCE de-energizes circuits when conditions reach elevated FPI (12 or 13), plus a combination of 99th percentile wind speeds and NWS Wind Advisory and High Wind Warning.

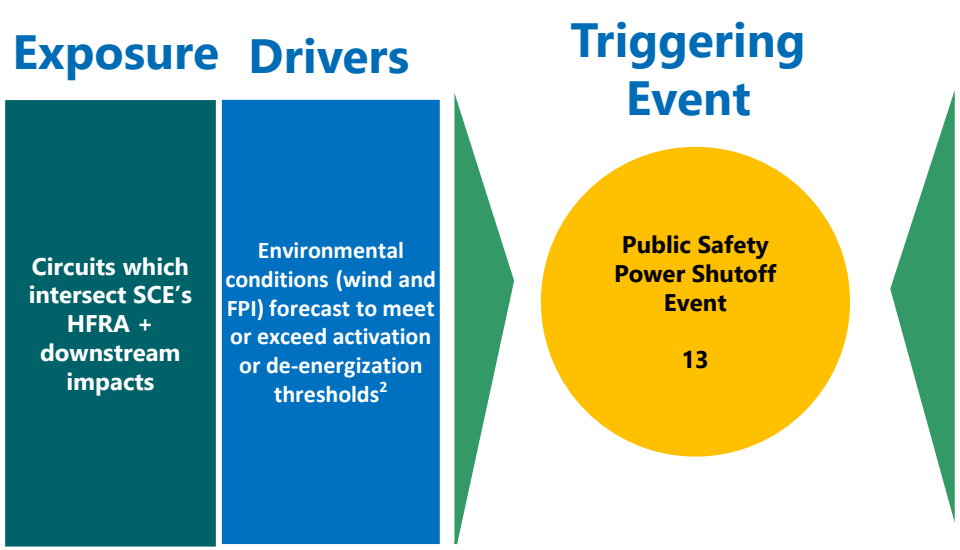
Summary of SCE's PSPS Proposed Plan

- SCE's PSPS Proposed Plan is built around continuing SCE's PSPS protocols and operating procedures, as well as ongoing customer programs, services and notifications.
- Despite no major changes to protocols or execution, SCE expects the frequency and duration of proactive PSPS de-energization to decrease as wildfire mitigation work and grid hardening continues.
- In addition to the proposed grid hardening, SCE also proposes to continue operational mitigation activities. These are primarily customer care programs, designed to mitigate the potential impacts of proactive de-energization events on customers. There is a particular focus in these programs on those customers that are considered Medical Baseline (MBL) and Access and Functional Needs (AFN).

Grid Operations & Protocols	Situational Awareness	Foundational
• Customer Resource Centers (CRC) /Community Crew Vehicle (CCV) • Critical Care Backup Battery (CCBB) • Community Resiliency • 211 Partnerships	• Weather and Fuel • Fire Science • Weather Stations	• Community Meetings • Marketing • PSPS Research & Education

PSPS Risk Bowtie[1]

Risk Definition: PSPS activation driven by weather forecasts exceeding FPI and wind speed thresholds.



Consequences[2]

Outcomes

Outcomes		Safety	Reliability	Financial
O1 - Customers and/or public safety partners notified but not de-energized	89.3%			
O2 - Customers and/or public safety partners notified and de-energized	7.1%	✓	✓	✓
O3 - Customers and/or public safety partners de-energized but not notified	3.6%	✓	✓	✓

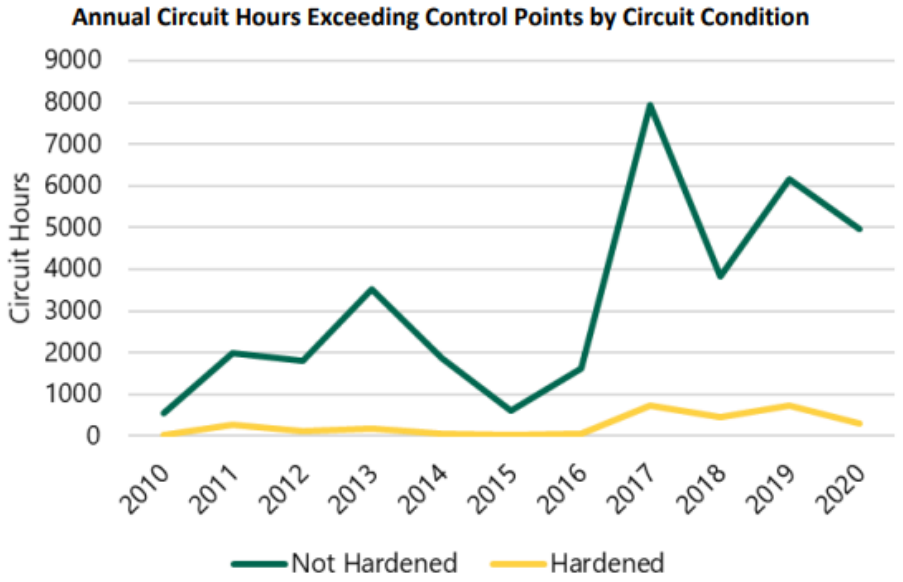
1) *The data is an average of 2020 – 2021 internal SCE data.*
2) *While SCE has not modeled any consequences for O1 in this RAMP, SCE acknowledges that the Commission has recognized the potential financial impacts for certain critical facilities and public safety partners resulting from such "false positive" PSPS notifications. See D.21-06-034 at pp. 79-80.*

Summary of SCE's Approach to PSPS Risk Modeling for the 2022 RAMP

Baseline Risk	Consistent with D.21.11-009, SCEs baseline risk was 2025. SCE included the risk reduction for planned work from 2022 – 2024 to develop the 2025 baseline wildfire risk.
Controls and Mitigations	SCE modeled and provided RSEs for all 7 controls as part of the Proposed PSPS Plan.
Tranching	SCE modeled PSPS at the circuit-segment level and provided the RSEs at the circuit level in Workpapers. However, for ease of reference and clarity of presentation in the RAMP chapter, the RSEs for controls that address PSPS as a risk were shown at the control level.
Emphasis on Critical Customers	SCE enhanced the PSPS safety attribute by applying a circuit-specific Access and Functional Needs (AFN)/Not Residential Critical Infrastructure (NRCI) multiplier. This multiplier represents the relative ranking of each circuit based on the number of AFN and NRCI customers on the circuit.
Treatment of Foundational Activities	Consistent with D.21.11-009, SCE included the foundational activity costs in the RSE's of the controls and/or mitigations that they directly support. SCE included 3 foundational activities that supported PSPS controls.

SCE's Wildfire Mitigation Efforts Prior to 2025 Will Help Minimize the Need for PSPS Events

- Based on current PSPS protocols, full covered conductor on a circuit allows SCE to raise wind speed thresholds from 31mph sustained winds or 46mph gusts, on average, to 40mph sustained winds or 58mph gusts.
- Based on SCE's plans to fully cover all (or receive a circuit exception) for all PSPS-impacted circuits by 2025, SCE expects to have a far lower exposure by the RAMP period.
- The yellow line below shows the system-wide circuit hours that exceeded the hardened (40/58) threshold.
- This average exceedance would represent a roughly 90% decrease in PSPS exposure.
- SCE estimates approximately 24 circuit de-energizations per year (LoRE) during the RAMP period of 2025 – 2028, compared to 284 in 2021.



	Post-Mitigation Risk Quantification Scores - (End of 2028)		
	LoRE	CoRE	Risk Score
PSPS	24.0	0.0068	0.16

Employee Safety

Todd Gallaher
Principal Manager, Edison Safety

Employee Safety Risk Introduction

- SCE's Employee workforce[1] perform critical and diverse tasks that are necessary to maintain the electric system including:
  - ✓ 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.
- In this RAMP, SCE discusses actions that are and will be taken to protect employees from safety risks that can result in serious injuries or fatalities (SIFs).
- SCE modeled and provided RSE's for all five controls as part of our Proposed Plan.
- SCE also included a discussion on three foundational activities that directly support SCE's Employee Safety risk mitigation efforts.

1) In 2021, SCE's employee workforce consisted of approximately 12,700 employees (counting both field employees and office employees).

Employee Safety Risk Definition and Scope

Risk Definition:
Incidents involving Edison employee, potentially exposing workers (self or others) to hazards, including:
- Hazards Arising from Construction or Maintenance Activities
- Hazards Arising from Supporting Activities
- Vehicle Incidents

In Scope	Out of Scope
• Acts performed by an SCE employee that lead to a serious safety incident. A serious safety incident is defined as a serious injury and/or fatality (SIF) following the Edison Electric Institutes (EEI) SCL (Safety Classification and Learning) model.	• Acts performed by an SCE employee that lead to a potential serious injury and/or fatality as defined by the EEI SCL model. • Lower severity injuries such as sprains, strains and/or DART injuries.

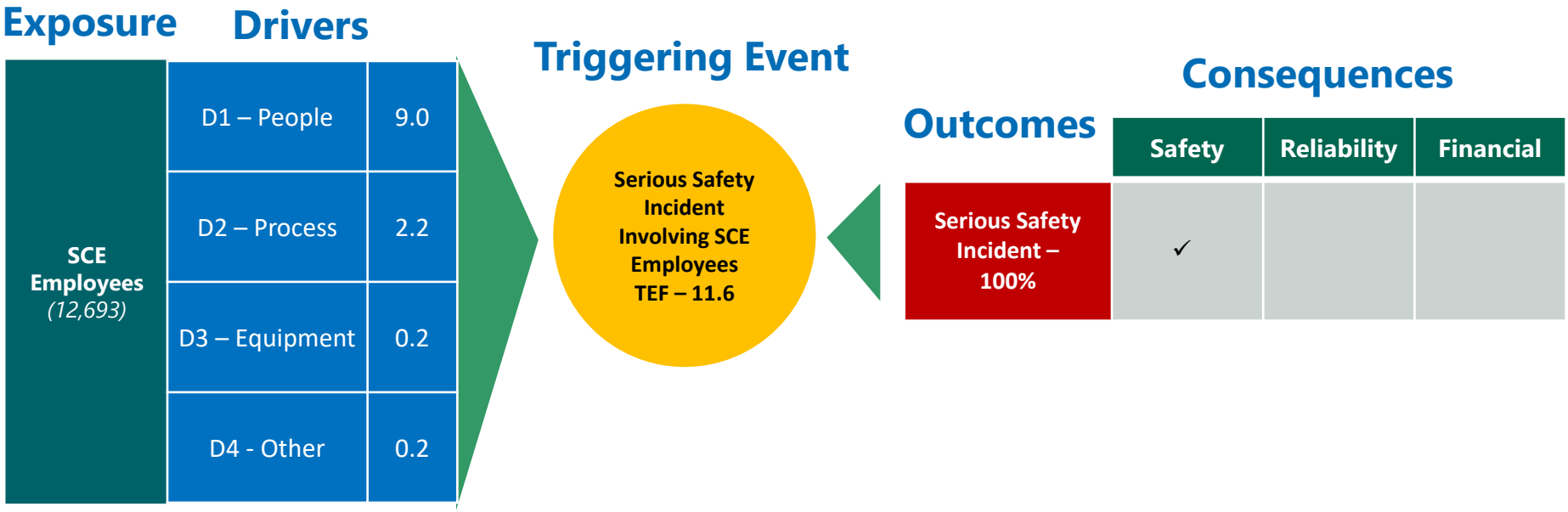
SCE began following the EEI SIF definition (from Cal OSHA) in 2018 to:

- ✓ Utilize benchmarking data with utilities outside of California, providing a greater degree of insight and experience.
- ✓ Leverage industrywide data that will be more statistically significant and will provide better insights for future safety mitigation efforts.
- ✓ Leverage the work of EEI's working group(s) of industry safety leaders, technical advisors and experts for SIF prevention.

Employee Safety Risk Bowtie*

SCE made two key updates from the 2018 RAMP:

- First, SCE constructed an employee-only safety risk bowtie to clearly differentiate the employee risk from contractor and public safety risks.
- Second, the 2022 RAMP bowtie focuses specifically on serious safety incidents, which are defined as incidents resulting in serious injury or fatality, according to the EEI SIF criteria.



For purposes of risk modeling, the only consequence SCE has identified for this triggering event is a safety consequence. The other two consequences, financial and reliability, are not directly applicable to this specific safety-focused triggering event.

** The data is an average of 2017 – 2021 internal SCE data that meets the EEIS SIF Criteria described on the previous slide.*

Employee Safety Risk Tranches

- SCE first differentiated our employees to office and field. This was prudent, since office and field workers have different risk profiles, and many of our controls and mitigations are focused on our field workers.
- We further divided the field workers into two categories based on type of work activity.

Tranche	Tranche Description	Exposure (# of Employees)	% of Risk Exposure	LoRE	% of Driver Frequency
1	Office Employees[1]	8,932	70%	1.4	12%
2	Field Employees - Lineman/Journeyman, Apprentice, Troubleman and Groundman	1,414	11%	6.4	55%
3	Field Employees – All others field workers[2]	2,352	19%	3.8	33%
Total		**12,693**	**100%**	**11.6**	**100%**

1) Office workers are SCE employees who perform more than 50% of their job responsibilities inside an office environment.

2) Includes the following other job types such as Field Service Reps, Field Supervisors, Maintenance workers and cable splicers.

Summary of SCE's Employee Safety Proposed Plan

- SCE's Proposed Plan reduces safety risks by implementing programs that are designed to directly reduce serious injuries and fatalities.
- In addition to continuing SCE's existing safety controls, this plan aligns with SCE's Safety Culture Transformation roadmap to reduce serious injuries.
- SCE can adopt new technologies within the proposed plan to effectively mitigate workforce safety risks.

Controls and Foundational Activities	General Description
C1 - Safety Culture Transformation	This includes activities to transform our company's safety culture.
C2 - Incident Cause Evaluation	This includes activities concerning the Corrective Action Program to identify learnings; the goal is to leverage learnings to reduce future safety incidents.
C3 - T&D Field Based Training	This includes activities to utilize agile and informal training to assist employee development and learning, in addition to facilitating formal training programs.
C4 - Human and Organizational Performance	This includes a cornerstone program for SCE to continue maturing as a proactive learning organization where all employees, leaders and executives work together to prevent serious injuries and fatalities.
C5 - Safety Predictive Initiative	This includes activities to build on SCE's strategy to use data proactively to spur learning, aid action planning, and drive decision-making to help reduce and eliminate SIFs.
F1 – Risk Based Safety Program	This includes activities to support SCE in making progress towards eliminating SIFs by proactively, programmatically, and systematically evaluating risks and mitigating them.
F2 – Safety Management System (SMS)	Provides SCE with an effective tool for continually improving our occupational health and safety performance, as well as a framework for sharing and communicating with other entities regarding best practices.
F3 – Incident Management System (IMS)	An IMS is a software solution that supports the entire incident management lifecycle. It allows incidents to be reported, evaluations to be managed, and corrective action plans to be monitored.

Treatment of Climate Change in RAMP

Kris Vyas

CAVA-RAMP Integration

- RAMP focuses on major safety risks in the near-term (SCE's RAMP period does not extend beyond 2028).
- The Climate Adaptation Vulnerability Assessment (CAVA) focuses on long-term vulnerabilities of SCE assets to climate change (2030, 2050, 2070). CAVA looks at vulnerabilities from not just safety, but reliability, financial, and other lenses as well.
- SCE integrated the CAVA into a dedicated Climate Change appendix. Further development of climate-related mitigations is anticipated to occur prior to the GRC application filing, and CAVA results are expected to be reflected in GRC funding requests.

Final Q/A and Roundtable

Closing Remarks

Kris Vyas