

CPUC/ENERGY SAFETY **PUBLIC MEETING ON SAFETY**

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Tim O'Toole

Chair, SCE Safety and Operations Committee, SCE Board Director

Available for Q&A:

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Chief Safety Officer, SCE; Vice President, Environmental, Health, Safety & Quality, SCE

August 29, 2024



SAFETY IS INTEGRATED INTO OUR BUSINESS THROUGH OUR VALUES AND MISSION

MISSION

**SAFELY PROVIDE
RELIABLE, CLEAN
AND AFFORDABLE
ENERGY TO OUR
CUSTOMERS**



VALUES

RESPECT	INTEGRITY	EXCELLENCE
SAFETY	CONTINUOUS IMPROVEMENT	TEAMWORK

RISK-INFORMED SAFETY FOCUS AREAS

PUBLIC SAFETY

- Reduce risk of significant wildfires
- Maintain/replace assets to avoid hazardous failures
- Create awareness of potential hazards

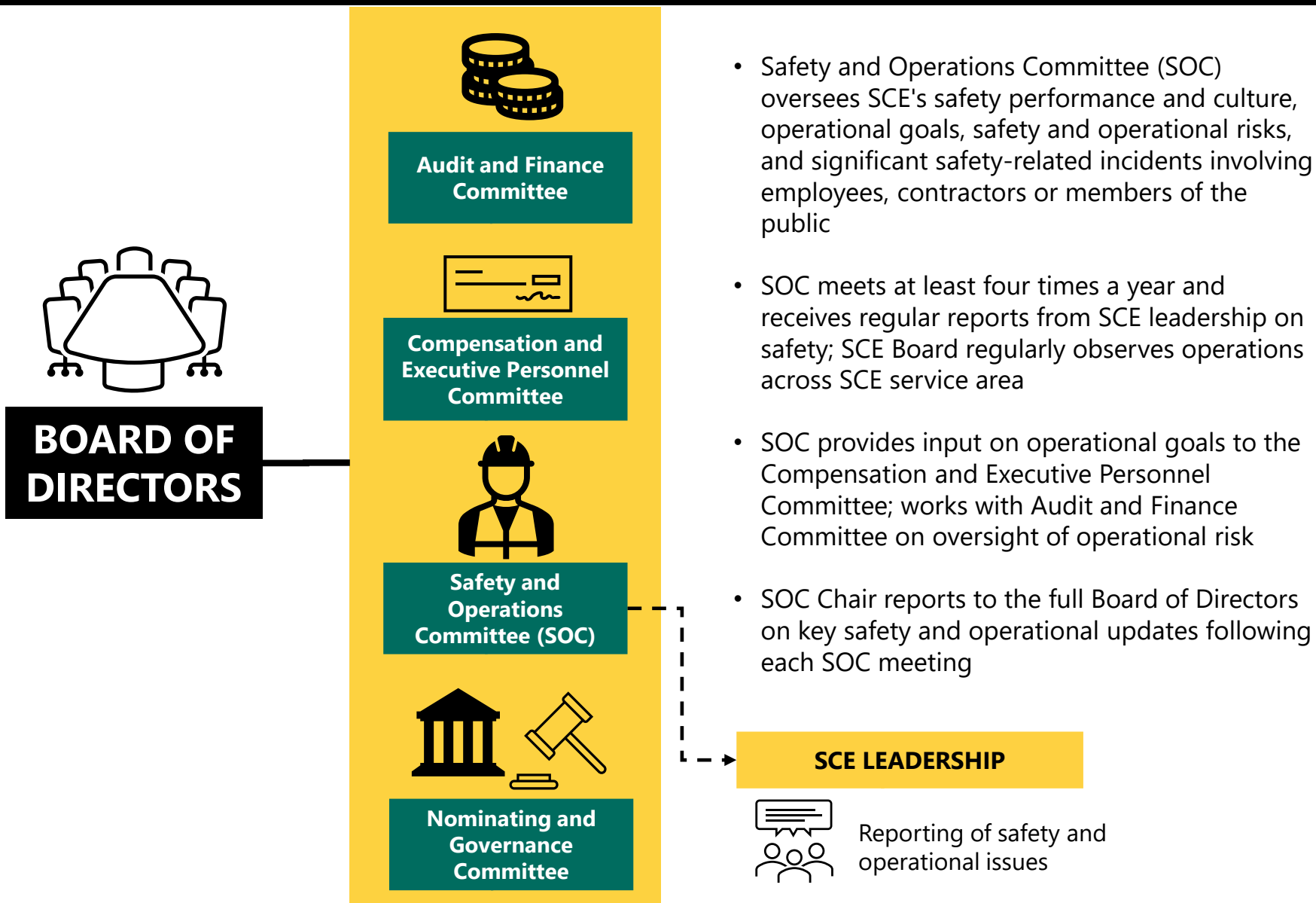
WORKER SAFETY

- Avoid serious injuries and fatalities through enhanced data analytics, safety systems and programs
- Better manage our contractors to improve safety, quality and compliance

SAFETY CULTURE

- Evolve safety culture maturity
- Improve leader ownership and accountability

CORPORATE GOVERNANCE: SCE'S SAFETY AND OPERATIONS COMMITTEE (SOC)



SOC RECEIVES REGULAR BRIEFINGS ON KEY SAFETY ISSUES AND RECOMMENDS FURTHER ACTIONS FOR MANAGEMENT

SAFETY ISSUES REVIEWED BY THE SOC INCLUDE:

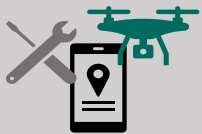
Public Safety, Wildfire Safety, and Worker Safety, among other topics. SCE has completed 100% of the 2022 SOC recommendations, and all but two of the 2023 SOC recommendations¹

SOC RECOMMENDED AREAS OF FOCUS²



SAFETY OBSERVATION DATA AND ADDITIONAL SAFETY METRICS

SOC focused on improving worker safety performance and reviewed worker safety reports, which include analysis of safety observation data and utilization of additional metrics, such as High Energy Control Assessments (HECA)



POTENTIAL TOOLS & TECH FOR WORKER SAFETY AND WILDFIRE RISK REDUCTION

SOC reviewed the Induction Safety Action Plan, including grounding analysis, enhanced personal protective equipment (PPE) for high-risk circuits, and annual refresher training for lineworkers; continued to review progress on Wildfire Mitigation Plan activities including new technologies to reduce wildfire risk



CONTINUED REPORTING ON PUBLIC SAFETY RISK REDUCTION EFFORTS

SOC continued to review reports on public safety risks, such as car-hit-pole and wire-down incidents

[1] The senior management team plans to address the two 2023 SOC recommendations by end of 2024

[2] Refer to Appendix on page A-2 for a list of recommendations

SOC AND MANAGEMENT MONITOR SAFETY PERFORMANCE USING A COMPREHENSIVE SET OF METRICS ACROSS KEY SAFETY RISK AREAS

- Safety performance metrics span wildfire, public, and worker safety areas to provide a holistic view of company safety performance
- Annual targets are set to achieve a balance between being challenging and attainable

2024 METRICS REVIEWED BY SOC (NOT EXHAUSTIVE)



WILDFIRE SAFETY

- CPUC reportable ignitions in High Fire Risk Areas (HFRA)
- Covered conductor circuit miles installed
- Vegetation Line Clearing: % of trims on time
- Ground & aerial HFRA inspections & remediations
- PSPS customer notifications: % of timely notifications



PUBLIC SAFETY

- Serious Injuries and Fatalities (SIFs) reported to CPUC
- Wire downs across SCE territory
- Underground equipment failures
- Public safety campaign awareness



WORKER SAFETY

- SIFs
- Quality Safety Observations
- High Energy Control Assessments (HECA)
- Days Away, Restrictions or Transfers (DART)

SCE'S SAFETY GOVERNANCE MODEL HELPS TO STRENGTHEN CULTURE AND IMPROVE SAFETY PERFORMANCE

OVERSIGHT

Safety and Operations Committee (SOC)



SCE MANAGEMENT SAFETY GOVERNANCE



PUBLIC SAFETY

A structured approach to review risk issues and determine appropriate mitigations

FINANCE & RISK MANAGEMENT COMMITTEE



RISK MANAGEMENT WORKING GROUP



PUBLIC SAFETY ROADMAP (ENTERPRISE RISK MANAGEMENT, SYSTEM PLANNING & ENGINEERING)



WORKER SAFETY

A top-down, bottoms-up approach to strengthen culture and improve performance

EXECUTIVE SAFETY COUNCIL



SENIOR SAFETY COUNCIL



ORGANIZATIONAL UNIT SAFETY COUNCILS/ CONGRESS/TEAM

SAFETY GOVERNANCE IS FURTHER ENHANCED THROUGH **THREE LINES OF DEFENSE**

1st

Front Line Organizations
Accountable for executing controls

2nd

Enterprise Risk Management, Safety Org, QA/QC groups, Ethics & Compliance
Proactive advice, oversight, and monitoring

3rd

Audit Services Department
Independent assurance

ENTERPRISE RISK MANAGEMENT HELPS IDENTIFY ISSUES AND DRIVE IMPROVEMENTS IN PUBLIC SAFETY

Enterprise Risk Management systematically helps identify and drive mitigation of operational and other risks through a common risk management framework, modeling, tools, and taxonomy



CLIMATE CHANGE



WILDFIRE / PSPS



CONTACT WITH ENERGIZED EQUIPMENT



PHYSICAL SECURITY



CYBER ATTACK



HYDRO DAM FAILURE



UNDERGROUND EQUIPMENT FAILURE



SEISMIC



DIG INS



VEHICLE HIT POLE

PUBLIC SAFETY RISK MITIGATIONS ARE PRIORITIZED BASED ON RISK ASSESSMENT

- Infrastructure Hardening & Replacement
- Inspections & Remediations
- Vegetation Management
- Situational Awareness
- Data Governance
- Emerging Technology
- Emergency Preparedness
- Grid Operations & Protocols
- Customer Care Programs

SCE'S INTEGRATED WILDFIRE MITIGATION STRATEGY TAKES A RISK-INFORMED APPROACH TO MITIGATION SELECTION & DEPLOYMENT

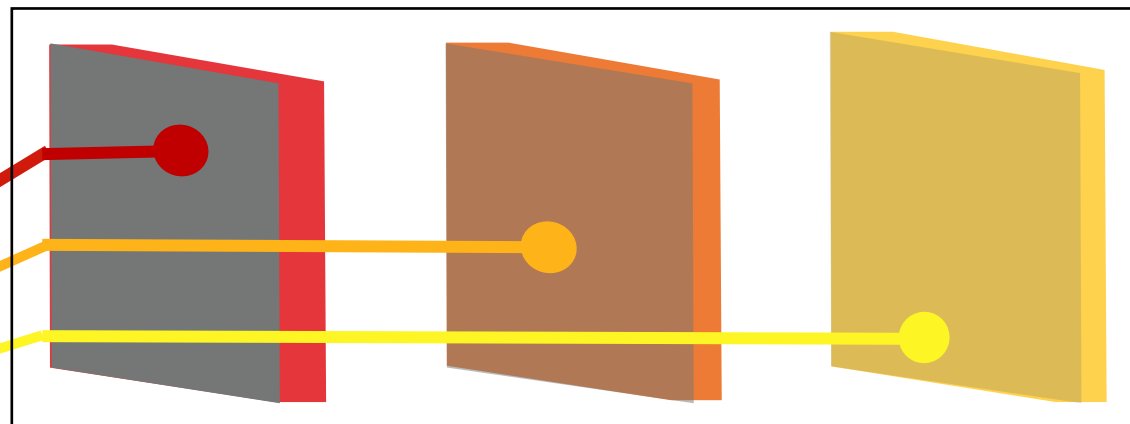
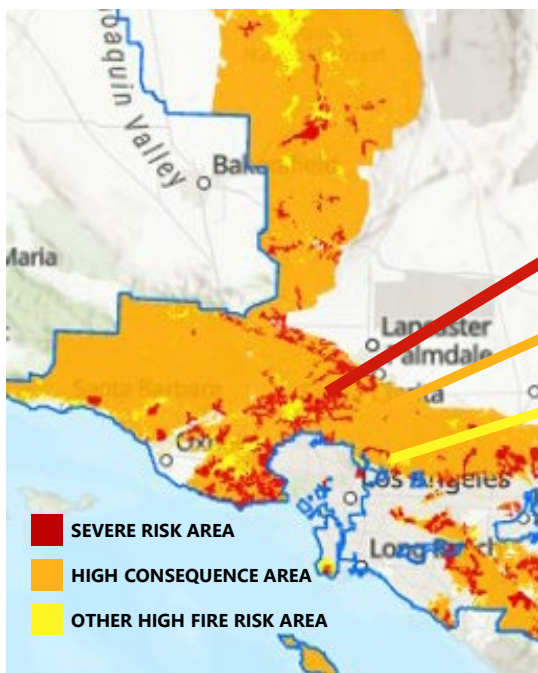
1 IDENTIFY AND PRIORITIZE RISKIEST AREAS USING RISK MODELS AND TOOLS



2 DETERMINE BEST MITIGATION(S) TO ADDRESS RISK DRIVERS IN EACH AREA



3 VALIDATE/REVISE MITIGATION SELECTION THROUGH EXPERT REVIEWS



SEVERE RISK AREA MITIGATION

Covered conductor, Rapid Earth Fault Current Limiter (REFCL) & other mitigations* — OR— undergrounding for fire risk egress constrained locations, extreme high wind areas, communities of elevated fire concern, and/or extreme consequence areas

HIGH CONSEQUENCE AREA MITIGATION

Covered conductor & other mitigations* for locations that meet 300-acre confidence threshold at 8 hours, or locations at risk of PSPS

OTHER HIGH FIRE RISK AREA MITIGATION

Inspections & remediation, vegetation management & other mitigations* for locations not in severe risk or high consequence areas

*Other mitigations include fire-resistant poles installation, asset inspections, fast curve settings for circuit breaker relays, along with vegetation management activities (as necessary), including hazard tree management program, pole brushing and line clearing

SCE IS SEEING NUMEROUS PROOF POINTS AND RESULTS FROM ITS SUBSTANTIAL WILDFIRE MITIGATION EFFORTS SINCE 2018



85-90%+

Reduction in the probability of catastrophic wildfires associated with its equipment since 2018

5,900+ MILES
OF COVERED CONDUCTOR¹



NO IGNITIONS
due to failure of
covered conductor

2 MILLION+
TRIMS AND REMOVALS IN
HIGH FIRE RISK AREAS¹



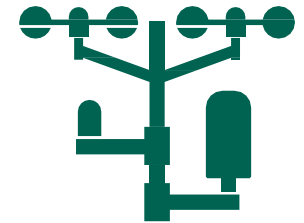
**100% FEWER
STRUCTURES**
destroyed²

1 MILLION+
INSPECTIONS IN HIGH FIRE
RISK AREAS¹



**99% FEWER
ACRES**
burned²

1,760+
WEATHER
STATIONS



**~90% VISUAL
COVERAGE**
of high fire risk
areas

190+
HD
CAMERAS

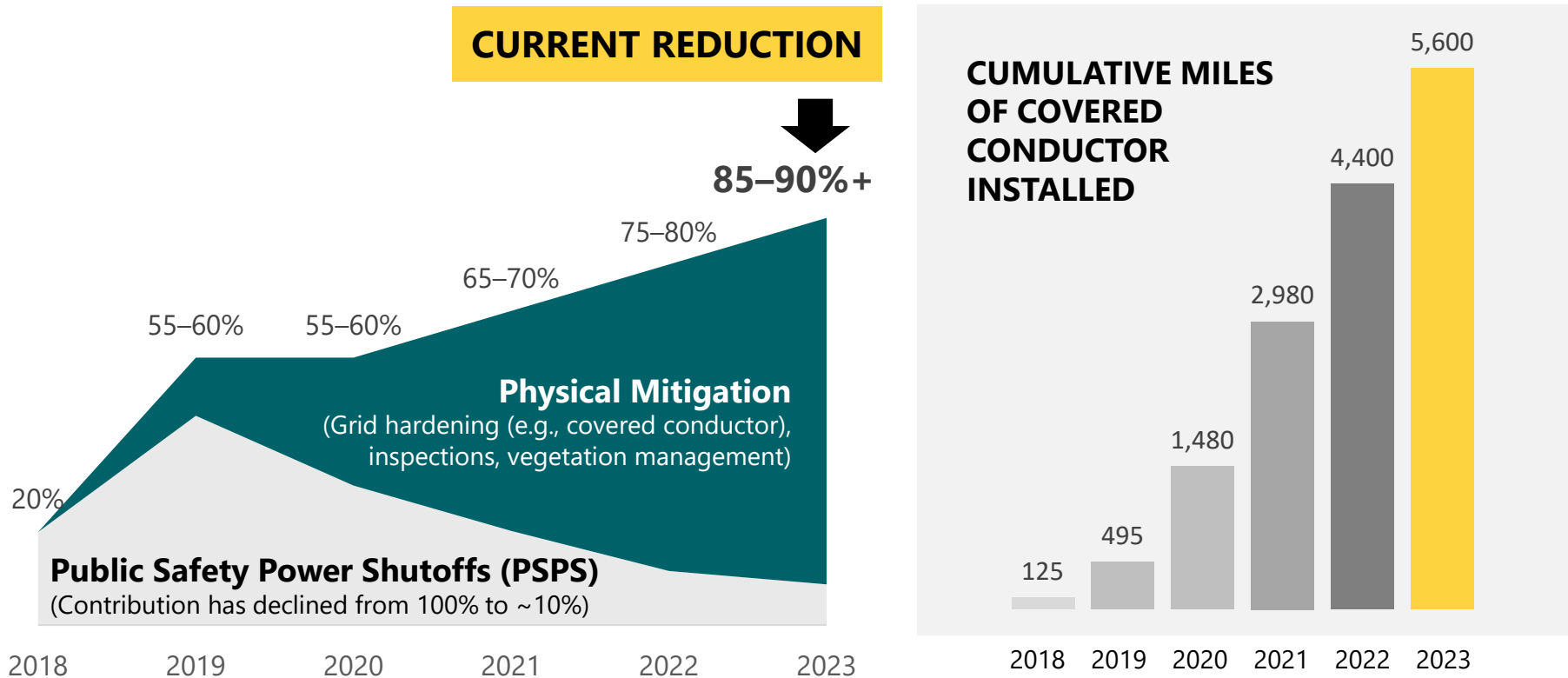
[1] Since 2018 in high fire risk areas and as of June 30, 2024

[2] In 2023 compared to 2017-18

SCE HAS REDUCED USE OF PSPS FOR LOWERING WILDFIRE RISK THROUGH COVERED CONDUCTOR AND OTHER PHYSICAL MITIGATION

SCE's wildfire risk mitigation is differentiated by its speed of hardening its infrastructure

Estimated reduction in probability of catastrophic losses using the independent Moody's RMS wildfire risk model compared to pre-2018 levels¹

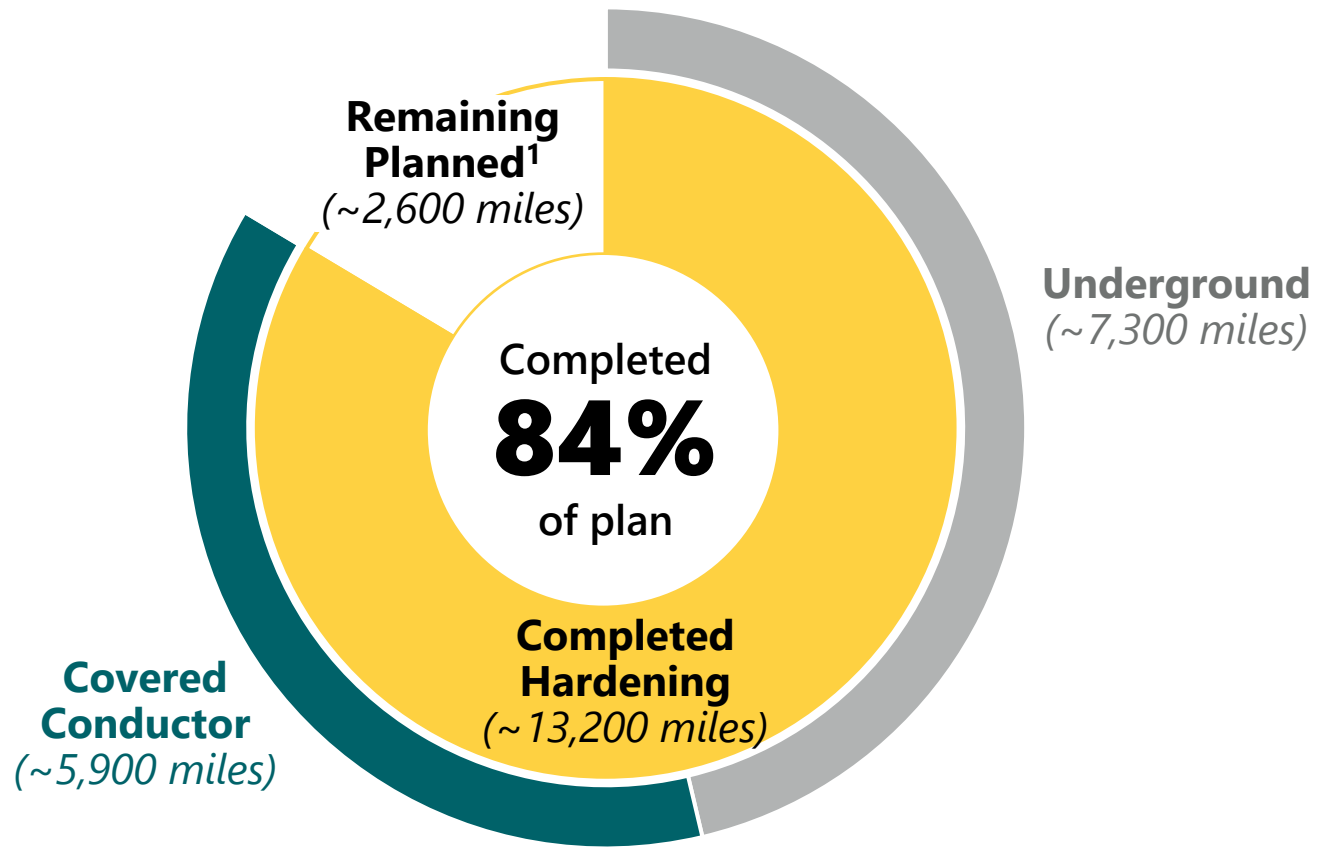


[1] Baseline risk estimated by Risk Management Solutions, Inc. (Moody's RMS) using its wildfire model, relying on the following data provided by SCE: the location of SCE's assets, reported ignitions from 2014–Q3 2023, mitigation effectiveness and locations of installed covered conductor, tree removals, inspections, line clearing, fast curve settings, and PSPS de-energization criteria. There are risks inherent in the simulation analysis, models and predictions of SCE and Moody's RMS relating to the likelihood of and damage due to wildfires and climate change. As with any simulation analysis or model related to physical systems, particularly those with lower frequencies of occurrence and potentially high severity outcomes, the actual losses from catastrophic wildfire events may differ from the results of the simulation analysis and models of Moody's RMS and SCE. Range may vary for other loss thresholds. PSPS and System Hardening Values are estimated by SCE based on operational experience in 2018–2020 compared to the subsequent modeled years.

SCE COMPLETES 84% OF PLANNED HARDENING OF DISTRIBUTION LINES IN HIGH FIRE RISK AREA (HFRA)

STATUS OF CURRENTLY PLANNED GIRD HARDENING IN HFRA DISTRIBUTION CIRCUIT MILES

By end of 2025, expect to be approaching 90% of total distribution lines in high fire risk area hardened



[1] Includes covered conductor and undergrounding. 2025–2028 is subject to regulatory approval. SCE has requested funding for ~1,830 miles during 2025–2028 in its 2025 GRC

SCE CONTINUOUSLY EVALUATES NEW TECHNOLOGIES AND APPROACHES TO FURTHER REDUCE WILDFIRE RISK

SCE evaluates and implements new technologies that can ultimately complement existing wildfire initiatives by mitigating risk drivers not previously addressed, or by potentially addressing drivers in more effective ways and can lay the foundation to work even more efficiently



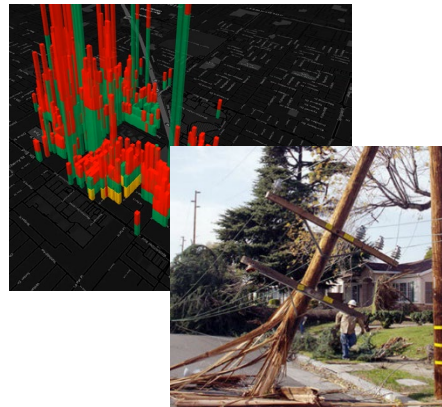
RAPID EARTH FAULT CURRENT LIMITER (REFCL)

Detects and reduces ground fault energy before ignition can occur



ASSET DEFECT DETECTION USING ARTIFICIAL INTELLIGENCE & MACHINE LEARNING

Applies image recognition algorithms to speed up ID of potential asset defects



ENERGIZED WIRE DOWN DETECTION

Utilizes machine learning algorithm to quickly de-energize circuit and deploy rapid response with approximate location detection

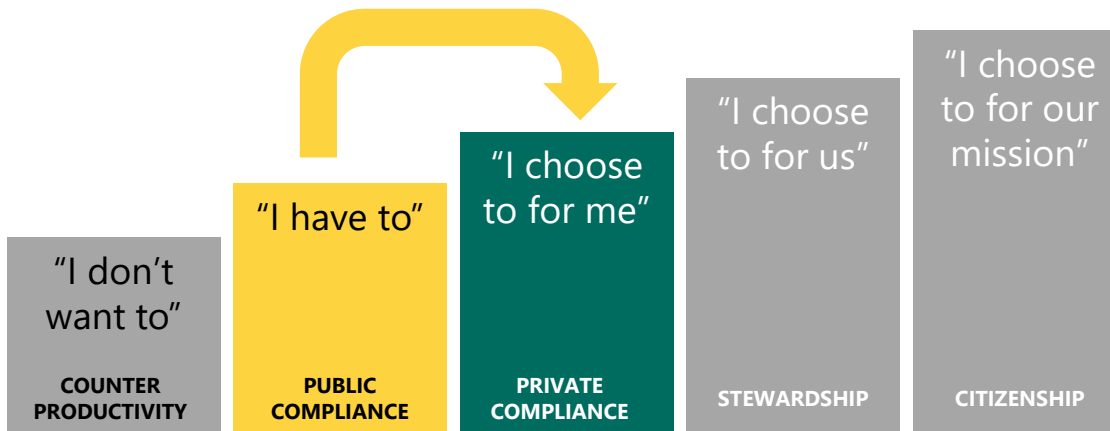


SATELLITE IMAGERY FOR VEGETATION MANAGEMENT

Pairs with image recognition models to provide details of vegetation around utility assets

SCE TRIENNIAL SAFETY CULTURE ASSESSMENT

- SCE has administered an independent comprehensive safety culture assessment triennially since 2017
- SCE's safety culture efforts continue to drive safety culture maturity with marked improvements in officer safety commitment and employee production pressure.



SAFETY CULTURE MATURITY MODEL

70% of employees feel the safety culture has improved and **68%** of employees have seen improvement in safety leadership in 2023

OFFICE OF ENERGY INFRASTRUCTURE SAFETY: ANNUAL SAFETY CULTURE ASSESSMENT





2023 RECOMMENDATIONS IMPLEMENTED

- Continue building capacity as a learning organization and improving organizational processes
- Optimize safety communication between leadership and frontline workers
- Improve training for frontline workers on wildfire suppression and mitigation technology
- Continue ongoing efforts to mitigate workers' risk exposure posed by interactions with hostile members of the public
- Increase participation in the workforce survey


2024 APPROACH FOR RECOMMENDATIONS

- Implementing an Environmental, Health, Safety and Quality (EHSQ) management system to better integrate and foster learning; Human and Organizational Performance Learning/Sharing sessions continue to build learning organization capacity
- Conducted sessions to share PSPS and safety information facilitating improved communication between leaders and frontline workers; live field observers will receive timely information on de-energized circuits
- Provided over 400 frontline workers with Rapid Earth Fault Current Limiters training
- Developed process for workers to set an appointment with customers after repeated attempts to gain property access helping to mitigate hostile interactions with members of the public
- Implementing a leadership communication plan and coordinating similar survey efforts to improve workforce survey participation

SCE IS INCORPORATING LESSONS LEARNED FOR CONTINUOUS IMPROVEMENT

AREA OF IMPACT	LESSON LEARNED & ACTION TAKEN
<p data-bbox="162 439 425 474">Industry Learnings</p> 	<p data-bbox="544 365 1850 436">The tragic 2023 Lahaina wildfire on Maui caused many in the utility industry to examine how they can prevent similar catastrophes in their service area.</p> <p data-bbox="544 479 857 511">How SCE Responded</p> <p data-bbox="544 516 1831 665">To address similar wildfire risk on Catalina island, such as egress concerns, SCE is deploying an integrated grid hardening approach by installing covered conductor in areas with tall vegetation, ridge pin crossarms in areas with probability for wire slap, and REFCL to limit ground faults and their associated ignition risks.</p>
<p data-bbox="142 759 444 825">Impact from Extreme Weather Events</p> 	<p data-bbox="544 722 1804 825">In addition to mitigating wildfire risk, SCE’s covered conductor has shown to be resilient against non-wildfire related events such as atmospheric rivers, heavy snowfall and car-hit pole incidents.</p> <p data-bbox="544 873 857 905">How SCE Responded</p> <p data-bbox="544 911 1823 982">To improve reliability, public safety and resiliency, SCE’s standards will be updated to install covered conductor when power lines require replacement in non-high fire risk areas.</p>

SCE IS INCORPORATING LESSONS LEARNED FOR CONTINUOUS IMPROVEMENT

AREA OF IMPACT	LESSON LEARNED & ACTION TAKEN
<p>Operations</p> 	<p>SCE continually benchmarks with utilities abroad, particularly Tokyo Electric Power Company (TEPCO) and Korea Electric Power Corporation (KEPCO), who both have used covered conductor on their distribution wires for decades, TEPCO since 1966 and KEPCO since 1978.</p> <p>How SCE Responded SCE learned as part of its benchmarking, they utilize more robust covers and seal all equipment including dead-end clamp, branch sleeves, compression sleeves, insulators and connectors. SCE is seeking to incorporate their best practices into the next deployment of covered conductor.</p> <p>SCE noticed an increase of secondary ignitions between 2019 and 2021.</p> <p>How SCE Responded SCE has enhanced its vegetation management and inspection measures to address the risk of secondary ignitions. In addition, SCE updated its wildfire covered conductor program standard to include the replacement of open wire secondary or weather-resistant aluminum with multiplex conductors. These multiplex conductors can withstand contact from foreign objects and help mitigate ignition events.</p>

CPUC/ENERGY SAFETY
PUBLIC MEETING ON SAFETY

Thank you



APPENDIX: SAFETY METRIC PERFORMANCE EXAMPLES

		2020	2021	2022	2023
Wildfire Safety	CPUC reportable ignitions in HFRA	51	48	41	19
	Covered conductor circuit miles installed	965	1,454	1,399	1,220
	Vegetation Line Clearing: % of trims on time	82%	79%	88%	86%
	Ground & aerial HFRA inspections and remediations ²	72%	74%	80%	79%
Public Safety	Public SIFs reported to CPUC	12	9	5	13
	Wire downs across SCE territory ³	1,099	1,153	1,029	1,115
Worker Safety	Employee Serious Injuries and Fatalities (SIFs) Rate	0.124	0.062	0.088	0.089
	Employee Days Away, Restrictions or Transfers (DART) Rate	0.9	1.05	1.18	1.48
	Contractor SIF Rate	0.192	0.124	0.060	0.100
	Contractor DART Rate	0.45	0.36	0.25	0.44

[1] Represents the percentage of P2 findings remediated 30 days before compliance due date

[2] Includes distribution primary wire downs including major event days

APPENDIX: RECENT SCE SAFETY AND OPERATIONS COMMITTEE RECOMMENDATIONS

RECOMMENDATION (PAST 12 MONTHS)	STATUS
Provide additional analysis of safety observation data and correlating safety performance improvements	Completed
Provide a review of contractor management areas of focus for improvement	Completed
Continue to report on safety performance utilizing additional metrics, including High Energy Control Assessments and progress on implementing Safety Management System	Completed
Provide additional details on the implementation of its 2024 worker safety roadmap	Completed
Share district-level data related to worker safety performance	Completed
Provide additional details on recent serious injuries and identify lessons learned and actions being taken in response	Completed
Provide an update on covered conductor corrosion and the proactive replacement strategy ¹	Completed
Provide a report on high and low energy serious injuries and fatalities (SIFs), as well as potential impacts of future changes to Edison Electric Institute’s SIF definition	Completed
Provide an update on leader safety talent reviews in Distribution organizational unit	Completed
Share Association of Edison Illuminating Companies (AEIC) safety work practices benchmarking	In Progress ²
Provide an update on the third-party review of all technical training programs for lineworkers	In Progress ²

[1] Certain instances of corrosion found on covered conductor with aluminum wire within one mile of the coast

[2] The senior management team plans to address the in-progress board recommendations by end of 2024