SOUTHERN CALIFORNIA EDISON®
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03/31/2021

Caroline Thomas Jacobs, Director
Wildfire Safety Division
California Public Utilities Commission
505 Van Ness Avenue
San Francisco, CA 94102

SUBJECT: Southern California Edison Company's 2020 Wildfire Mitigation Plan Annual Report on Compliance (EC ARC) Pursuant to PUC Section8386.3(c)(1)

Director Thomas Jacobs,

Pursuant to California Public Utilities Code (PU Code) §8386.3(c)(1) and the Wildfire Safety Division's (WSD) Final Guidance on Compliance Operational Protocols issued on February 16, 2021, Southern California Edison Company (SCE) submits this annual report addressing compliance with its Wildfire Mitigation Plan (WMP) during calendar year 2020.

If you have any questions, or require additional information, please contact me at carla.peterman@sce.com.

Sincerely,

//s//
Carla Peterman
Senior Vice President, Regulatory Affairs
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cc: Service List for R.18-10-007
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Southern California Edison Company's 2020 WMP Annual Report on Compliance

I. INTRODUCTION

Pursuant to Section 8386.3(c)(1) of the PU Code and the WSD's Final Guidance on Compliance Operational Protocols issued on February 16, 2021, SCE submits is Annual Report on Compliance (EC ARC) addressing compliance with its WMP during calendar year 2020. SCE substantially complied with its Commission-approved 2020-2022 WMP for wildfire mitigation work in 2020, as set forth in detail below.

On February 7, 2020, SCE submitted its second comprehensive WMP covering the years 2020 through 2022 and building on its 2019 WMP, including successes and lessons learned. After an extensive review process that included discovery, workshops and comments, the Commission approved SCE's 2020-2022 WMP on June 11, 2020.[1]

In 2020, and since approval of its 2020-2022 WMP, SCE has complied with the follow-up requirements in Resolution WSD-004 and ordered in D.19-05-036:

- As required by D.19-05-036, SCE submitted Advice 4222-E on June 1, 2020 describing its proposals to modify, reduce, increase, suspend or end wildfire mitigation measures in SCE's 2020 WMP that are not working, or that otherwise require modification.

- As required by Resolution WSD-004, SCE filed a Remedial Compliance Plan on July 27, 2020 to resolve identified deficiencies and has filed three Quarterly Reports on 2020-2022 WMP Class B Deficiencies.

In 2020, SCE tracked 69 specific wildfire-related programs and activities included in its 2020-2022 WMP spanning areas including infrastructure hardening, vegetation management, detailed inspections and remediations, and situational awareness in SCE's High Fire Risk Areas (HFRA). SCE's WMP also emphasizes Public Safety Power Shutoff (PSPS) resilience and community engagement, particularly for under-represented groups and access and functional needs customers. SCE's 2020-2022 WMP also increases the use of advanced risk analytics and innovative technologies to help the company prioritize the activities with the greatest potential to mitigate wildfire risks and improve public safety.

Despite the challenges posed by the COVID-19 pandemic, in 2020, SCE concluded or operationalized the vast majority of its 2020 WMP goals and substantially completed the

[1] CPUC WMP approval statement available at:

https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M340/K129/340129782.PDF

remaining activities. In addition, SCE is aggressively pursuing advancements in its risk-informed decision-making, data management, grid hardening, and community/stakeholder engagement before, during, and after wildfire-related events. As reported in Advice 4437-E,[2] COVID-19-related restrictions and, during the second half of the year, fires and the associated diversion of crews, poor air quality, and US Forest Service work stoppages as well as heat waves impacted implementation plans for four of the 69 WMP activities (distribution and transmission inspection-driven remediations, aerial inspections and unmanned aerial operations training). Nevertheless, these activities were substantially completed by the end of 2020. Further details on SCE's progress in executing 2020 WMP activities under SCE's 2020-2022 WMP can be found in Advice 4437-E, also appended to this ARC as Attachment A.[3]

Below, SCE addresses the five requirements set forth in WSD's Compliance Operational Protocols regarding EC ARC.

II. SCE RESPONSES TO ANNUAL COMPLIANCE REPORT REQUIREMENTS

a) *An assessment of whether the EC met the risk reduction intent by implementing all of their approved WMP initiatives, i.e., the degree to which initiative activities have reduced ignition probabilities;*[4]

   i. *If the EC fails to achieve the intended risk reduction, EC shall provide a detailed explanation of why and a reference to where associated corrective actions are incorporated into their most recently submitted WMP.*

SCE met the risk reduction intent by completing the vast majority of its approved WMP initiatives and substantially completing remaining activities in 2020.

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[2] Southern California Edison Company's Quarterly Advice Letter Pursuant to PU Code Section 8389(e)(7) Regarding the Implementation of Its Approved Wildfire Mitigation Plan and Its Safety Culture Assessment and Safety Recommendations, March 8, 2021 (SCE Q4 2020 QAL).

[3] SCE is completing its data validation of 2020 WMP activities and as a result, some figures reported in SCE's AB 1054 Q4 2020 Advice Letter (Advice 4437-E), submitted March 8, 2021, have been slightly revised. These revisions have been noted in Attachment A to this EC ARC and do not impact the status of activities. SCE further notes that reported 2020 figures are subject to further revision as it completes its data validation process.

[4] WSD's guidance describes this section as providing an "(e)xplanation of how ignition probabilities and estimated wildfire consequences have been reduced during the compliance period as a result of WMP initiative implementation (i.e., for the EC ARC due March 31, 2021, the EC shall report on the prior compliance period, defined as January 1, 2020 to December 31, 2020)."

SCE proposed several key effectiveness metrics to evaluate risk reduction and has shared how each WMP activity relates to these metrics in detail in its 2021 WMP Update Supplemental filing on February 26, 2021.[5] The relevant portions are attached to this EC ARC as Attachment B. This table details the WMP activities in the 2021 WMP update, but it also covers the primary activities in the 2020 WMP. The key effectiveness metrics SCE proposed are CPUC reportable ignitions in HFRA (total and by key drivers), faults in HFRA (total and by key drivers), wire down incidents in HFRA, number of customers and average duration of PSPS events, and timeliness and accuracy of PSPS notifications. SCE notes as it has done previously in the 2021 WMP Update and other responses, that since most of the mitigations were implemented less than a year ago, and at most approximately two years ago, there has been insufficient time to observe improvements in these key metrics. In addition, given the variability of exogenous factors such as climate/weather conditions, fuel/drought conditions, size of the infrastructure, etc., additional years of data are required to comprehensively assess the impact of mitigations and analyze trends.

Though effectiveness metrics improvement validation will take more time, SCE ascertains it has met its risk reduction intent as it has substantially met or exceeded the vast majority of its 2020 WMP activity targets. For example, SCE installed 960 circuit miles of covered conductor compared to a target of 700 circuit miles, completed all inspections in HFRA per plan and completed the vast majority of remediations on time,[6] remediated more than 12,000 hazard trees (double the number from 2019), and upgraded more than 6,000 poles to fire-resistant versions compared to a target of 5,200. SCE also undertook additional activities that were not in the original 2020 WMP such as supporting fire agencies' fire suppression efforts and additional inspections during the fire season based on emergent dry fuel accumulation and high wind conditions. SCE also used risk as an important input to help prioritize work within activities (supplemented with operational factors such as resource availability, permit requirements, environmental constraints, and bundling work by location for efficiency in scheduling), further increasing SCE's ability to meet its risk reduction intent.

SCE is at the initial stages of analyzing effectiveness metrics, but preliminary data shows there have been no ignitions due to the risk drivers covered conductor prevents against at locations where covered conductor has been deployed. This data is currently for a relatively small portion of SCE's HFRA where covered conductor has been installed over a limited timeframe since installation,

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[5] Southern California Edison 2021 Wildfire Mitigation Plan Update Supplemental Filing Corrected, filed February 26, 2021, available at: https://www.sce.com/sites/default/files/AEM/Wildfire%20Mitigation%20Plan/2021/2021%20Wildfire%20Mitigation%20Plan%20Update%20Supplemental%20Filing%20Corrected.pdf, pp. 228-230 and pp. A1-A8.

[6] SCE completed 97% of Distribution Remediations (SH-12.1) and 95% of Transmission Remediations (SH-12.2), noting delays due to resource diversion to restoration efforts from fires, other precautions taken due to record dry fuel conditions, and COVID-related restrictions.

but the results are encouraging and can be validated only after more data has been collected over time. 2020 was a severe fire activity year, and SCE needed to de-energize more circuits and customers for PSPS, of the circuits and customers de-energized in 2019, 46% and 35% fewer respectively were de-energized in 2020. Though this data has not been normalized for weather and other factors, they indicate improvements derived from the WMP activities undertaken by SCE.

SCE also notes that we continue to enhance our risk analysis capabilities as described in detail in Chapter 4 of SCE's 2021 WMP Update and will use these results to further refine deployment prioritization. The impact of mitigation activities already undertaken and the updated risk analysis for the planned activities are summarized in the ignition reduction forecasts in Table SCE 4.3 in SCE's 2021 WMP Update.

b) *A full and complete listing of all change orders and any other operational changes, such as initiative location changes, made to WMP initiatives, with an explanation of why the changes were necessary, and an assessment of whether the changes achieved the same risk reduction intent;*

Please see Tables 1, 2, and 3 below for a listing of all proposed changes to WMP initiatives in 2020, as reported either in Off-Ramp or Change Order filings throughout 2020. The table also includes the purpose, expected outcomes and whether risk reduction intent was met from the proposed changes. In some cases, the proposed changes are for enabling activities, which do not directly reduce wildfire or PSPS risk or consequence. Please also refer to SCE's response to Part A for further discussion on how SCE met the risk reduction intent of its 2020 WMP.

Table 1
June 1, 2020 – SCE's Off Ramp Report Advice Letter[7]

Change to 2020 WMP Impacted Activity	Purpose of Change	Change in Expected Outcomes from Impacted Activity	Status	Risk Reduction Intent Assessment
Section 5.3.9.2: DEP-3 **IOU Customer Engagement[8]** **(Activity Suspended)**	SCE ended its partnership with the statewide customer engagement campaign and proposes to redeploy the funds to local marketing campaign.	Focusing on community campaigns will help customers and communities better understand and prepare for wildfires and PSPS events. Correspondingly, the proposed adjustment is aligned with the original objective of a statewide campaign to educate customers about PSPS events and reduce the impacts of PSPS events through customer preparedness. To evaluate the effectiveness of local campaigns, measures customer awareness and customer attitude,[9] with the results aggregated quarterly and annually. SCE also clarified in subsequent communications with WSD that terminating its participation in the statewide program will	**Approved**[10] - The WSD found that SCE had sufficiently accounted for impacts resulting from ending the statewide initiative and redeploying the funds to local community initiatives.[11]	**N/A - Enabling activity**: change is to leverage other engagement methods (in place of the state-wide campaign) to better prepare customers for wildfire and PSPS events. Those methods do not necessarily lead to reduction in impact and it is not feasible to reasonably measure the impact of those activities on reducing PSPS impacts.

[7] June 1, 2020 Tier 3 Advice Letter, Subject: Southern California Edison Company's Reports on Possible Off Ramps Pursuant to the Guidance Decision on 2019 Wildfire Mitigation Plans

[8] SCE's proposal to remove IOU Customer Engagement as a WMP Activity was also discussed in SCE's 2020 WMP First Change Orders Report Filed September 11, 2020

[9] SCE uses the Customer Attitude Tracking (CAT) survey to measure customer awareness and expects to meet the local marketing awareness campaign goal of 40%.

[10] WSD approval received on February 26, 2021 WSD Action Statement, Subject: SCE September 11, 2020 Change Order Report.

[11] Approval of a WMP or Change Order Report does not equate to approval of costs. See Resolution WSD-002, Ordering Paragraph 2, and Resolution WSD-004, Ordering Paragraph 5.

Change to 2020 WMP Impacted Activity	Purpose of Change	Change in Expected Outcomes from Impacted Activity	Status	Risk Reduction Intent Assessment
		not affect other state programs.		
Section 5.3.3.8.2: PSPS-8 **Microgrid Assessment** **(Modify - Increase in Scale)**	Microgrid Assessment – Activity PSPS-8 to now include PSPS Resiliency Zones	SCE determined that customer impacts could be further reduced in rural communities previously impacted by PSPS events by keeping essential services electrified. As such, SCE initiated a pilot program in 2020 to provide a mobile generator backup to electrify certain essential services in rural areas previously impacted by PSPS events. SCE targeted seven rural communities in support of this pilot effort including up to three essential sites (e.g., gas stations, grocery stores, pharmacy, fire station, and police station) per community in the HFRA. The Resiliency Zones pilot will enable SCE to evaluate the benefit derived to the community with respect to energizing essential services.	**Pending response**[12] - As reported in the SCE's 2021 WMP Update (Section 7.3.5.5.2.2), the Resiliency Zones pilot has reached agreements with four customer sites and has contracted with three electrical suppliers to prepare these sites for installation of backup generators. SCE will continue to work with County and Community leaders to identify additional sites.	**Under Evaluation** - SCE will assess the installations and the benefits derived by the community with respect to energizing essential services during PSPS.
Section 5.3.6.5.2: PSPS-3 **Customer Resiliency Equipment Incentives** **(Modify - Increase in Scale)**	Customer Resiliency Equipment Incentives – Activity PSPS-3 to now include PSPS Well Water Resiliency Generator Incentive	The Well Water and Water Pumping Backup Generation program was developed to assist customers who have a dependency on electricity to pump water for basic use in their home or business, with the purchase of a portable backup	**Pending response**[13] - Well Water and Water Pumping Backup Generation is discussed in more detail in SCE's 2021 WMP Update in Section 7.3.6.5.2.3	**Under Evaluation** - Well Water and Water Pumping Backup Generation is a pilot, and SCE is currently analyzing results from survey feedback which will help inform enhancements to the program. Recommendations are expected early Q2 2021.

[12] Advice 4222-E submitted June 1, 2020 is pending approval by the Commission.

[13] Advice 4222-E submitted June 1, 2020 is pending approval by the Commission.

Change to 2020 WMP Impacted Activity	Purpose of Change	Change in Expected Outcomes from Impacted Activity	Status	Risk Reduction Intent Assessment
		generator. Providing equipment incentives for certain residential, small commercial, and schools in the Acton and Agua Dulce communities dependent on well water will help reduce impacts of PSPS events.		

Table 2
Proposed Activity Changes in SCE's 2020 WMP First Change Orders Report
Filed September 11, 2020[14]

Change to 2020 WMP Impacted Activity	Purpose of Change	Change in Expected Outcomes from Impacted Activity	Status	Risk Reduction Intent Assessment
Section 5.3.10.3: **Cooperation with Suppression Agencies** **(Change in Scope of Work)**	Given the intensity of the 2020 fire season and potential strain on fire-fighting resources, SCE wants to pilot the use of a Helitanker and determine appropriate SOPs/metrics going forward.	Access to the helitanker will improve fire suppression capability in SCE's service area, thus reducing the potential consequence of fires including safety incidents, property damage (including damage to SCE's assets) and loss of critical infrastructure and essential services including electricity.	**Approved**[15] – the WSD found that SCE has sufficiently accounted for the impacts resulting from the collaboration with OCFA to lease the helitanker.	**Achieved -** Reduction in consequence of wildfires in SCE's HFRA (four 2020 fires had enhanced fire suppression from the Helitanker, which released over 300,000 gallons of water during 145 water drops)
Sections: **5.3.4.9.1: IN-1.1;** **5.3.4.10.1: IN-1.2;**	SCE is continuing to improve its inspection programs to incorporate more lessons learned. This has resulted in SCE conducting	Increasing the scale of both Distribution and Transmission inspections in HFRI reduces wildfire risk (ignition probability) based on the number of defects found and remediated. In its response to Class B Deficiency Guidance-1, SCE provides the	**Pending Approval**[16] - Further justification required - The WSD finds that SCE has not sufficiently accounted for the impacts resulting from the increased scale of HFRI for Distribution and	**Achieved -** Remediation of notifications resulting from these inspections (due to

[14] Southern California Edison Company's First Change Orders Report, September 11, 2020

[15] WSD approval received on February 26, 2021 WSD Action Statement, Subject: SCE September 11, 2020 Change Order Report.

[16] WSD pending approval received on February 26, 2021 WSD Action Statement, Subject: SCE September 11, 2020 Change Order Report.

Change to 2020 WMP Impacted Activity	Purpose of Change	Change in Expected Outcomes from Impacted Activity	Status	Risk Reduction Intent Assessment
Dist./Trans. High Fire Risk - Informed Inspections (HFRI) in HFRA **(Increase in Scale)**	additional HFRI in 2020.	baseline of the original program targets. This increase in scale of inspection work will further reduce wildfire risk presented in that response and reflected in SCE's 2021 WMP Update submission.	Transmission Electric Lines and Equipment as SCE has not demonstrated the reason for the large increases in costs related to the increased scope of inspections. Additionally, since SCE has relied on risk models that have not been fully vetted by the WSD, the WSD defers approval of the change to the scale and scope of HFRI inspections to its review of SCE's 2021 WMP Update. SCE provides more justification for this program in the 2021 WMP Update (Section 7.3.4.9.1). Risk analysis performed for this program resulted in a relatively high Risk Spend Efficiency (RSE) value, supporting the continued need for this program to proactively identify equipment failures and potentially hazardous conditions before an ignition could occur.	increase in scale of risk-informed inspections)[17]
Section 5.3.6.5.7: **OP-2** **Wildfire Infrastructure Protection Team Additional Staffing**	SCE is proposing an increase in scale for its Wildfire Infrastructure Protection Team to include 18 additional full-time employees who will serve on the dedicated PSPS	While this initiative does not directly reduce probability or consequence of ignitions, dedicated and specialized staff helps to ensure operational consistency and enhance efficiency in implementing PSPS standards/protocols, thus reducing PSPS impacts on customers.	**Approved**[18] - The WSD finds that SCE has sufficiently accounted for the impacts of increasing its Wildfire Infrastructure Protection Team to include 18 additional full-time employees.	**N/A - Enabling activity -** While this initiative does not directly reduce probability or consequence of ignitions, dedicated and specialized staff to help ensure operational consistency and enhance efficiency in implementing PSPS standards/protocols, thus

[17] SCE notes that the decision to increase inspections was to gain a 360-degree view of assets in SCE's system, and was not driven by the WRRM; rather inspections were prioritized based on the risk profile of the assets

[18] WSD approval received on February 26, 2021 WSD Action Statement, Subject: SCE September 11, 2020 Change Order Report.

Change to 2020 WMP Impacted Activity	Purpose of Change	Change in Expected Outcomes from Impacted Activity	Status	Risk Reduction Intent Assessment
(Increase in Scale)	Incident Management Team (IMT). Based on lessons learned in 2019-2020, having variable resources between PSPS events created inefficiencies in operations and decision-making. A /dedicated PSPS IMT reduces stress on employees allowing them to focus on their routine work.	This initiative adjustment is expected to reduce the number of events requiring activation of broader IMT resources from across the company (normalized by weather events). These dedicated resources should additionally increase the accuracy and precision of each PSPS response.		reducing PSPS impacts on customers.

Table 3
Proposed Activity Changes in SCE's 2020 WMP Second Change Orders Report
Filed December 11, 2020[19]

Change to 2020 WMP Impacted Activity	Purpose of Change	Change in Expected Outcomes from Impacted Activity	Status	Risk Reduction Intent Assessment
Section 5.3.6.5.1: PSPS-2 Community Resource Centers (CRCs) **(Increase in Scale)**	As noted in its 2020-2022 WMP, SCE anticipated that the CRC scope recommendation would be finalized in 2020 (post-2020-2022 WMP submission) as it improves its ability to ensure timely deployment and	Increasing the scale of SCE's CRC program supports more customers' needs during PSPS events, thus reducing the potential impact of a PSPS de-energization. The location and timing of CRC locations are selected based on an assessment of circuits most likely to be impacted by a PSPS event and in consultation with local governments in the	**Approved**[21]- The WSD finds that SCE has sufficiently accounted for impacts resulting from the increase in scale and availability of its CRCs.	**Achieved** - Reduced consequence of PSPS

[19] Southern California Edison Company's Second Change Orders Report, December 11, 2020

[21] WSD approval received on February 26, 2021 WSD Action Statement, Subject: Southern California Edison December 11, 2020, Change Order Report.

Change to 2020 WMP Impacted Activity	Purpose of Change	Change in Expected Outcomes from Impacted Activity	Status	Risk Reduction Intent Assessment
	customer access to CRCs in coordinated locations. SCE increased its count of CRC locations to 56 sites with which it contracts to activate in the case of a PSPS event.	impacted area. Additionally, the PSPS Phase 2 Decision imposes certain requirements on CRCs such as location criteria, hours of operation, and services. CRCs will be activated from 8 a.m. – 10 p.m. during an active event unless the event ends before 10 p.m. or the government facility at which the CRC is located provides guidance otherwise. Based on these regulatory requirements and stakeholder feedback on the need for temporary relief and additional information during PSPS de-energization events, it is imperative to have swift access to enabled (ready for activation) CRC sites across both urban and remote areas in SCE's HFRA.[20]		
Sections: **5.3.4.9.1: IN-1.1;** **5.3.4.10.1: IN-1.2;** **5.3.4.16: IN-5;** **5.3.5.4** **Asset and Vegetation**	During the 2020 fire season, SCE identified 17 Areas of Concern (AOCs) in its HFRA, primarily driven by elevated dry fuel levels that pose increased fuel-driven and wind-driven fire risk. In order to mitigate this risk, a dedicated team managing	The objective of this adjustment is to further reduce risk of a devastating wildfire by prioritizing the inspection and associated remediations of structures with a high Probability of Ignition (POI) in areas that have not had a burn, natural or human-caused, in recent years, and have dry fuel levels that pose increased fuel-driven and wind-driven fire risk that, if ignited, could have serious consequence to SCE's	WSD has indicated that further justification is required[22] - Since the changes described rely on the risk models still undergoing evaluation, WSD finds that SCE has not provided sufficient justification for the proposed change in its December 11, 2020, Change Order Report.	**Achieved -** The intent of this activity was to identify ignition risks in areas with elevated dry fuel levels and remediate those risks prior to fire season. There were ~14,000 notifications created resulting from the additional inspections. SCE remediated these notifications as intended. SCE notes that SCE's risk models were not the driver of this change.[23]

[20] If a CRC cannot be established in a particular community, SCE may utilize one or more of its Community Crew Vehicles (CCVs) to support the community impacted by a PSPS event.

[22] Further justification required per February 26, 2021 WSD Action Statement, Subject: Southern California Edison December 11, 2020, Change Order Report.

[23] SCE notes that rather than being driven by WRRM, the decision to increase inspections was to gain a 360-degree view of assets in SCE's system that were also located in high-risk areas of concern during the 2020 fire season, with inspections prioritized based on the risk profile of the assets.

Change to 2020 WMP Impacted Activity	Purpose of Change	Change in Expected Outcomes from Impacted Activity	Status	Risk Reduction Intent Assessment
Management and Inspections **(Modification to Methodology)**	inspections, remediation and vegetation was required to accelerate inspections, remediation and vegetation trimming and removal in the identified AOCs. This program primarily supplements the following 2020 WMP initiative activities: IN-1.1: High Fire Risk Informed Inspections – Distribution IN-1.2: High Fire Risk Informed Inspections – Transmission IN-5: High Fire Risk Informed Inspections – Generation 2020 WMP Section 5.3.5.4: Emergency Response Vegetation Management due to Red Flag Warning or Other Urgent Conditions	communities, customers and facilities. Moving forward, the analysis conducted will be incorporated into SCE's latest risk modeling. However, emergent conditions may necessitate a similar pivot in future years. SCE continues to analyze findings of the latest inspection results and remediation progress to inform its asset condition inputs to the POI model. Risk profiles change as more inspection data is compiled and analyzed and issues remediated, which will be reflected in future adjustment of SCE's risk-informed inspection cadence using improved risk modeling as described above.		

c) Descriptions of all planned WMP initiative spend vs actual WMP initiative spend and an explanation of any differentials between the planned and actual spends;

In Attachment C, SCE provides a table describing all forecast WMP initiative capital and O&M spend versus actual WMP spend in 2020 and a description of the variance drivers. SCE has

focused on describing variance drivers for initiatives where actual spend exceeded +/- 20% of forecast costs and, where this threshold was triggered, for variances greater than or less than $1M.

d) A description of whether the implementation of WMP initiatives changed the threshold(s) for triggering a PSPS event and/or reduced the frequency, scale, scope and duration of PSPS events;

In 2020, SCE saw considerable benefits from the deployment of WMP initiatives which allowed for a reduction in the scope/scale, frequency and duration of PSPS events. These benefits were largely derived from two main sources: distribution circuit sectionalization and SCE's circuit exception process.

Though the data has not been normalized for weather or other factors, in 2020, SCE's sectionalizing efforts helped avoid over 203,409 customer outages, an estimated 47% decrease from the number of outages the impacted circuits would otherwise have experienced. SCE used the weighted average duration of PSPS outages to calculate the likely customer minutes of interruption (CMI) avoided, estimated at 234 million customer minutes of interruption. Circuit de-energizations are more difficult to assess as a number of decision-making factors for PSPS de-energizations beyond FPI and windspeed have to be backcast. However, SCE's best estimate is that the increased thresholds associated with its circuit exception process avoided approximately 27 circuit de-energizations, or 6% of the total 2020 PSPS de-energizations. The circuit outages avoided would have yielded a further 28 million CMI, taking the 2020 total of likely CMI avoided to 262 million minutes. See Figure 1 for details.

Figure 1: 2020 PSPS Improvements

	Scope/Scale[24] *Customer Outages*	**Estimated Frequency** *Circuit De-energizations*	**Estimated Duration**[25] *Customer Minutes of Interruption (CMI)*
PSPS Reduction	203,409	27	262M

Sectionalization has thus far proven to be one of the most effective methods for SCE to reduce the scope and impacts of PSPS events. When SCE can de-energize only a portion of a distribution circuit, i.e., isolating the power loss only to areas with high fire threat conditions, more customers premises remain energized than would have been possible if the entire circuit

[24] SCE is unclear what the difference is between scope and scale of a PSPS event

[25] Duration Reduced (CMI) calculated as: Customer Outages Reduced x Weighted Average Duration of a PSPS Outage

was affected. This isolating capability is made possible using sectionalization devices such as remote-controlled switches and remote automated reclosers included in WMP Activity SH-5. SCE installed 48 new isolation devices in 2020 under this WMP activity. Along with SCE's broad network of existing devices already in the field, this enabled the operational flexibility to reduce customer outages while still eliminating the fire ignition risk.

SCE can use sectionalizing devices to reduce de-energization scope because conditions and de-energization thresholds can differ across the length of a circuit. To determine differing conditions, SCE used its network of 1,057 weather stations, 593 of which were installed in 2020, to obtain a real-time, granular understanding of weather conditions along a circuit. This enabled SCE's Incident Management Team to distinguish the risk among isolatable segments and leave portions of a circuit energized, even while other portions of the same circuit were experiencing threatening fire weather conditions and may have required de-energization.

Further, enhancements SCE made to its risk modeling efforts implemented as part of the circuit exception process enabled SCE to set varying thresholds across a single circuit. SCE's circuit exception process entails a detailed periodic review of circuits and circuit-segments located in HFRA to identify those with sufficiently low wildfire risk based on the latest circuit and environmental information. This allows SCE to increase wind speed thresholds on a particular circuit or circuit segment. Wildfire risk changes on this scale can be brought about through deployed PSPS mitigations such as asset upgrades or circuit reconfiguration, or through fuel loading changes driven by processes like urbanization or a recent burn scar. Through this exception process, SCE changed thresholds on 26 circuits, which enabled us to reduce PSPS de-energization for more than 31,000 customers in 2020.

SCE had other activities that led to reduced PSPS impacts in 2020. Two of SCE's distribution circuits (Gunsite and Cuddeback) achieved full covered conductor installation in 2020, allowing SCE to raise their PSPS thresholds to the National Weather Service's High Wind Warning level (40 mph sustained, 58 mph gusts). Both of these circuits were de-energized before the change but were able to avoid de-energization for all 346 customers in scope after the thresholds were increased. SCE's Shovel circuit had its thresholds raised as well based on more traditional grid maintenance. The Shovel circuit was de-energized several times in 2020 using its outage-informed threshold of 25 mph sustained wind and 40 mph wind gusts, but as the result of SCE's grid hardening efforts, was able to avoid de-energization for the two other events in 2020 once its thresholds were raised to 31 mph sustained and 46 mph gusts.

While SCE made measured progress in furthering longer term remediations like grid hardening and backup generation in 2020, SCE is working to aggressively build upon those efforts to drive incremental improvements in 2021 and beyond. For example, while more than 1,400 circuit miles of covered conductor has been deployed across SCE's HFRA, the thresholds for the circuit

segments can be raised only when entire isolatable portions have been covered. SCE is prioritizing the historically frequently impacted circuits for additional covered conductor installation to reduce PSPS scope and frequency prior to the 2021 fire season. These efforts and others are described in more detail in Section 8.1.4 of SCE's 2021 WMP Update and in SCE's PSPS Corrective Action Plan.

e) A summary of all defects identified by the WSD within the annual compliance period, the corrective actions taken and the completion and/or estimated completion date.

Information on all defects identified by the WSD during the 2020 calendar year and corrective actions taken or planned by SCE is summarized in the table below.

Table 4
Summary of Defects Identified by WSD in 2020

#	Defect Description	Inspection Date	Planned Completion Date	Completion Date[26]	Corrective Action
1	Loose/unattached anchor guy	7/15/20	Completed	7/23/20	Anchor guy was attached to the anchor
2	Loose/unattached anchor guy	8/13/20	Completed	8/27/20	Anchor guy was attached to the anchor
3	Exposed conductor sticking out of jumper tap connection	9/3/20	Completed	9/18/20	Connector cover was repositioned to cover the exposed wire
4	Conductors and connection not covered	10/6/20	Completed	10/16/20	Data error in completed project list provided to WSD. Pole was inadvertently included in a work order listed as complete. This was corrected in SCE's system[27]
5	Mislabeled pole	10/8/20	Completed	10/22/20	Pole was labeled with the correct number[1]
6	Vegetation touching anchor guy above the insulator	10/21/20	Completed	11/19/20	Vegetation was cleared from the anchor guy

[26] All Planned Completion and Completion dates fall within the time permitted by GO 95 for correction.

[27] SCE requested that WSD remove these findings as "defects" on the grounds that they do not violate any WMP, GO 95, or other CPUC compliance requirements.

7	Vegetation touching anchor guy above the insulator	11/5/20	5/10/21	TBD	TBD
8	Clearance between anchor guy above insulator and communication wire less than 3 inches	11/5/20	5/10/21	TBD	TBD
9	Vegetation touching anchor guy above the insulator	12/3/20	12/10/21	TBD	TBD
10	Vegetation touching anchor guy above the insulator	12/10/20	12/29/21	TBD	TBD
11	Vegetation touching anchor guy above the insulator	12/29/20	7/7/21	TBD	TBD

III. CONCLUSION

SCE appreciates the opportunity to submit its 2020 WMP Annual Report on Compliance and looks forward to working with the Independent Evaluator and continued collaboration with WSD in the review of SCE's 2020 WMP activities.

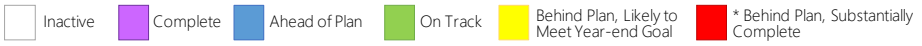
Attachment A: SCE Q4 2020 WMP Progress Update (Updated)

SCE's 2020-2022 Wildfire Mitigation Plan (WMP) Progress Update – Q4 2020 (Updated)*

(All data is as of December 31, 2020 or later)

*SCE is completing its data validation of 2020 WMP activities and as a result, some figures reported in Advice 4437-E. have been slightly revised. These revisions do not impact the status of activities and have been incorporated and noted in this updated WMP Q4 2020 Progress Update to accompany SCE's 2020 WMP Annual Report on Compliance. SCE further notes that reported 2020 figures are subject to further revision as it completes its data validation process.

WMP Activities Summary



PSPS

- PSPS-1: De-Energization Notifications
  - PSPS-1.1: Notifications to public safety agencies and local gov't
  - PSPS-1.2: Notifications to CalOES via State warning system
  - PSPS-1.3: Notifications to the CPUC
  - PSPS-1.4: Enhance Emergency Outage Notification System
- PSPS-2: Have 23 available Community Resource Centers
- PSPS-3: Develop a customer resiliency equipment incentive pilot program
- PSPS-4: Income Qualified Critical Care (IQCC) Customer Battery Backup Incentive Program
- PSPS-5: Support MICOP partnership
- PSPS-6: Support Independent Living Centers Partnership
- PSPS-7: Have 5 available Community Crew Vehicles
- PSPS-8: Assess microgrid resiliency projects

Risk Analysis

- RA-1: Implement Wildfire Risk Reduction Model (WRRM) module of Technosylva

Emergency Preparedness

- DEP-1: Customer Education and Engagement
  - DEP-1.1: Send ~915K /~3.2M letters to customers in HFRA / non-HFRA
  - DEP-1.2: Host 8-12 community meetings
  - DEP-1.3: Conduct marketing campaign (reach 5M cust.)
- DEP-2: Hold internal training on de-energization protocols, determine staffing needs, and fill positions
- **DEP-3: Participate in a multi-channel, multi-lingual campaign to provide information on wildfire mitigations
- DEP-4: Develop a measure to track customer awareness of, preparedness for, and satisfaction with outage experiences

Vegetation Management

- VM-1: Hazard Tree Management Program. Assess 75,000 trees
- VM-2:. Perform brush clearance of 200,000 poles
- VM-3: Expand clearances for legacy facilities
- VM-4: Perform annual DRI inspection scope and compete mitigations according to guidelines
- VM-5: Perform 3,000 risk-based quality control vegetation management inspections

System Hardening

- SH-1: Install 700 miles of covered conductor in HFRA
- SH-2: Refine undergrounding overhead conductor methodology
- SH-3: Replace 5,200 poles with fire resistant poles
- SH-4: Install/replace fusing at 3,025 locations
- SH-5: Install 45 RARs/RCSs
- SH-6: Circuit Breaker Relay Hardware for Fast Curve
- SH-7: PSPS-Driven Grid Hardening Work
- SH-8: Deploy Transmission Open Phase Detection on 6 additional circuits
- SH-9: Transmission Overhead Standards (TOH) Review
- SH-10: Remediate 325 tree attachments
- SH-11: Legacy Facilities
- SH-12: Remediate all notifications with ignition risk, to be past due compliant by year-end
  - *SH-12.1: Distribution
  - *SH-12.2: Transmission
  - SH-12.3: Generation

Operational Practices

- OP-1: Review and update Annual System Operating Bulletin 322
- OP-2: Hire additional staff for Wildfire Infrastructure Protection Team
- *OP-3: Increase the number of UAS operators by an additional 50 crews

Alternative Technologies

- AT-1: Meter Alarming for Downed Energized Conductor
- AT-2.1: Evaluate performance of Distribution Fault Anticipation technology
- AT-2.2: Conduct Extended Visual Line of Sight demonstration UAS flights
- AT-3: Alternative Technology Evaluations
  - AT-3.1: Initiate design and equipment order for a Ground Fault Neutralizer
  - AT-3.2: Initiate design to convert a substation to resonant grounding
  - AT-3.3: Install one Rapid Earth Fault Current Limiter - Isolation Transformer
  - AT-3.4: Complete Distribution Open Phase Detection pilot
- AT-4: Alternative Technology Implementation – Vibration Dampers
- AT-5: Asset Defect Detection Using Machine Learning Object Detection
- AT-6: Assessment of Partial Discharge for Transmission Facilities
- AT-7: Early Fault Detection (EFD) Evaluation
- AT-8: High Impedance Relay Evaluations

Situational Awareness

- SA-1: Install 375 Weather Stations
- SA-2: Fire Potential Index (FPI) Phase II. Refine current FPI
- SA-3: Complete installation of two High-Performance Computer Clusters
- SA-4: Implement FireCast and FireSim modules of Technosylva
- SA-5: Perform fuel sampling in HFRA
- SA-6: Map surface and canopy fuels across HFRA
- SA-7: Initiate procurement of remote sensing technology
- SA-8: Implement fire science enhancement initiatives

Inspections

- IN-1: Ground Inspections
  - **IN-1.1: Inspect 105,000 distribution structures in HFRA
  - IN-1.2: Inspect 22,500 transmission structures in HFRA
- IN-2: Perform quality review on 15,000 transmission, distribution, and generation structures in HFRA
- IN-3: Infrared Inspection of 50% of distribution circuits in HFRA
- IN-4: Infrared Inspection, Corona Scanning, and High Definition imagery of 1,000 transmission circuit miles in HFRA
- IN-5: Inspect 200 generation assets
- IN-6: Aerial Inspections
  - IN-6.1: Inspect 165,000 distribution structures in HFRA
  - *IN-6.2: Inspect 33,500 transmission structures in HFRA
- IN-7: Failure Modes and Effects Analysis (FMEA)

Source: All data is as of December 31, 2020 or later

** The Change Report filed in September 2020 describes that SCE has ended its statewide campaign (DEP-3) and that SCE plans to inspect (IN-1) ~165,000 distribution and ~33,500 transmission structures in HFRA in 2020.

WMP Activities Summary

Inactive | Complete | Ahead of Plan | On Track | Behind Plan, Likely to Meet Year-end Goal | * Behind Plan, Substantially Complete

PSPS Activities

Public Safety Agencies and Local Govt

De-Energization Notifications (PSPS-1.1)

Section 5.3.6.7 Page 171*

Program Target: Notify applicable public safety agencies and local governments of possible de-energization

Status Update: Through the end of December the PSPS Incident Management Team (IMT) was activated for 12 events. Notifications were sent to stakeholders during each event.

Cal OES

De-Energization Notifications (PSPS-1.2)

Section 5.3.6.7 Page 171

Program Target: Notify Cal OES through the State Warning Center of possible de-energization

Status Update: Through the end of December the PSPS Incident Management Team (IMT) was activated for 12 events. Notifications were sent out to stakeholders during each event.

CPUC

De-Energization Notifications (PSPS-1.3)

Section 5.3.6.7 Page 171

Program Target: Notify the CPUC of possible de-energization

Status Update: Through the end of December the PSPS Incident Management Team (IMT) was activated for 12 events. Notifications were sent out to stakeholders during each event.

Enhance EONS

Enhance Emergency Outage Notification System (PSPS-1.4)

Section 5.3.6.7 Page 171

Program Target: Enhance Emergency Outage Notification System (EONS) to include Zip Code level alerting to include in-language notifications to align with its existing notification abilities for SCE customers

Status Update: Zip code level and in-language notification enhancements (in Spanish, Mandarin, Cantonese, Vietnamese, Korean, and Tagalog) were implemented and used during PSPS events in 2020.

Community Resource Centers

243%
confirmed

Community Resource Centers (PSPS-2)

Section 5.3.6.5.1 Page 165

Program Target: Have 23 sites available across SCE service territory for customers impacted by a PSPS

Status Update: 56 CRCs have been contracted across 9 counties. Of these 56, 43 can operate with extended hours (8am to 10pm) per PSPS Phase 2 D.20-05-051.

Customer Resiliency Equipment

Customer Resiliency Equipment Incentives (PSPS-3)

Section 5.3.6.5.2 Page 166

Program Target: Develop a customer resiliency equipment incentive pilot program that provides financial support to customers willing to increase resiliency within its HFRA. One customer will be implemented for this pilot in 2020.

Status Update: The pilot program has been completed and the chosen location, a local high school, now has the ability to island itself from the grid and maintain emergency services during a power outage.

*SCE 2020-2022 Wildfire Mitigation Plan

WMP Activities Summary

Inactive | Complete | Ahead of Plan | On Track | Behind Plan, Likely to Meet Year-end Goal | * Behind Plan, Substantially Complete

PSPS Activities

IQCC Customer Battery Backup

Critical Care Battery Backup Program (CCBB)* (PSPS-4)

Section 5.3.6.5.3 Page 166

Program Target: Outreach to eligible customers (low income, critical care, Tier 2/3) to provide portable battery back-up solution. SCE has identified approximately 2,500 customers that it will target for the program in 2020, with efforts to begin in the second quarter.

Status Update: The program launched on July 7th and by year end ~2,600 customers had been offered the program via direct outreach. Customer enrollments and battery deliveries started in Q3 and continued throughout Q4.

MICOP Partnership

MICOP Partnership (PSPS-5)

Section 5.3.6.5.4 Page 167

Program Target: Enable communications with indigenous populations and measure the number of customers contacted

Status Update: Mixteco/Indigena Community Organizing Project (MICOP) has exceeded the year-end goal of conducting wildfire safety outreach to 600 customers. In June, MICOP started follow-up phone calls with customers who had received the initial outreach. The target of 100 follow-ups has also been exceeded.

Independent Living Center Partnerships

Independent Living Centers Partnership (PSPS-6)

Section 5.3.6.5.5 Page 167

Program Target: Conduct outreach activities and workshops/trainings to provide preparedness education and assistance in applying for the Medical Baseline Program and measure the number of customers contacted

Status Update: The Independent Living Centers (ILCs) program exceeded the target holding 10 workshops/trainings for customers with disabilities and others with access and functional needs in June.

Community Outreach

Community Outreach (PSPS-7)

Section 5.3.6.5.6 Page 168

Program Target: Minimum of five Community Crew Vehicles (CCVs) ready to be deployed during times when weather and fuel conditions are at critical levels. Communicate with customers in a local targeted way using a variety of channels to ensure timely delivery of notifications.

Status Update: A minimum of five CCVs were ready for deployment during each of SCE's PSPS activations in 2020. The CCV locator tool has featured on sce.com and been promoted during PSPS events. A virtual CCV website went live in Q3 offering customers wildfire safety resources and support.

Microgrid Assessment

Microgrid Assessment (PSPS-8)

Section 5.3.3.8.2 Page 124

Program Target: 1) Execute requests for proposals (RFP) for six resiliency microgrid projects, 2) Depending on RFP results, implementation of up to 6 resiliency microgrid projects shown to be technically feasible and cost-effective.

Status Update: The 2020 program target of issuing an RFP for six potential 2020 microgrid projects was completed. However, this RFP did not yield any cost-effective options. Learning from this experience, SCE evaluated alternative microgrid sites that could be safely and more economically islanded and issued a second microgrid RFP. SCE received a higher response rate than the RFP issued earlier in 2020, evaluated the submissions, and recommended proceeding with one vendor for a potential 2022 deployment.

*Formerly called the Income Qualified Critical Care (IQCC) Customer Battery Backup Incentive

WMP Activities Summary

Inactive | Complete | Ahead of Plan | On Track | Behind Plan, Likely to Meet Year-end Goal | * Behind Plan, Substantially Complete

Operational Practices and Risk Analysis Activities

OP: Operational Practices

Annual SOB 322 Review

Annual SOB 322 Review (OP-1)

Section 5.3.6.1.1 Page 161

Program Target: Review and update SOB 322 to reflect lessons learned from past elevated fire weather threats/PSPS events and integrate, where applicable, new and improved situational awareness data, improved threat indicators, and applicable regulatory requirements in an effort to reduce wildfire risk and the impact of outages on customers.

Status Update: Completed the annual SOB 322 bulletin, reflecting lessons learned from 2019, elevated threats, and PSPS events.

Wildfire Infrastructure Protection Staffing

Wildfire Infrastructure Protection Team Additional Staffing (OP-2)

Section 5.3.6.5.7 Page 168

Program Target: Hire additional resources including: a senior compliance manager, two compliance advisors, a project/program advisor, a data specialist and a fire-weather meteorologist. PSPS Operations will also be staffed to provide dedicated operational, project management, and compliance capabilities.

Status Update: PSPS Operations hiring was completed in November. Consultants are bridging the gap in Project Management and Compliance competencies until full time SCE employees can be hired.

UAS Operations Training

Unmanned Aerial (UAS) Operations Training (OP-3)

Section 5.3.4.9.2.2. Page 143

Program Target: Increase the number of UAS operators by an additional 50 crews

Status Update: Substantially complete. The goal of training an additional 50 UAS operators was not met, however, 42 resources passed the FAA 107 exam despite the closure of FAA testing centers due to COVID from March through July.*

RA: Risk Analysis

Expansion of Risk Analysis

Expansion of Risk Analysis (RA-1)

Section 5.3.2.7. Page 111

Program Target: Implement Wildfire Risk Reduction Model (WRRM) module of Technosylva (software platform)

Status Update: Technosylva delivered the WRRM software to SCE in Q4 2020. Following its quality review of the data and functionality of the WRRM software, SCE deemed that it met its requirements. SCE will continue working with Technosylva to incorporate enhancements throughout 2021.

* Following validation of records, 42 persons completed UAS 107 training and FAA certification in 2020. This is a decrease of 1 from what was published in the WMP Progress Update 2020-12-31 on 3/8/2021.

WMP Activities Summary

Inactive | Complete | Ahead of Plan | On Track | Behind Plan, Likely to Meet Year-end Goal | * Behind Plan, Substantially Complete

Vegetation Management Activities

HTMP
133%
trees assessed
97%
trees mitigated within 180 days

Hazard Tree Management Program (VM-1)

Section 5.3.5.16.1 Page 156
Program Target: Assess 75,000 trees for hazardous conditions and perform prescribed mitigations in accordance with program guidelines and schedules

Status Update: Assessed ~99,500 of 75,000 trees through Q4 and mitigated 97% of trees within 180 days, which exceeded the WMP Program Target.

Expanded Pole Brushing
117%
poles cleared

Expanded Pole Brushing (VM-2)

Section 5.3.5.5.1 Page 153
Program Target: Perform brush clearance of 200,000 poles
SCE will strive to perform brush clearance for 300,000 poles subject to resource constraints and other execution risks

Status Update: Pole clearances exceeded the WMP Target of 200K in November and ended the year at ~231,000 pole clearances.*

Expanded Clearances for Legacy Facilities

Expanded Clearances for Legacy Facilities (VM-3)

Section 5.3.5.5.2 Page 153
Program Target: Perform assessments of all identified facilities in HFRA. Establish enhanced buffers at 30% of identified facilities

Status Update: The activity was completed in December as enhanced buffers were completed at 39% (61) identified facilities, surpassing the original goal of 30% (46).

DRI Inspections & Mitigations

Drought Relief Initiative (DRI) Inspections and Mitigations (VM-4)

Section 5.3.5.16.2 Page 158
Program Target: Perform DRI annual inspection scope and complete prescribed mitigations in accordance with internal DRI program guidelines

Status Update: Drought Relief Initiative (DRI) inspections met year-end goal. 3rd (and final) cycle inspections completed mid-December. DRI mitigations exceeded year-end goal with 95% of active inventory aged less than 180 days, which exceeded the WMP target of 94%.

Vegetation Management Quality Control

Vegetation Management Quality Control (VM-5)

Section 5.3.5.13 Page 155
Program Target: Perform 3,000 risk-based HFRA circuit mile vegetation management Quality Control inspections

Status Update: Performed ~6,100 of 3,000 of risk-based HFRA circuit mile quality control inspections.

* Following validation of records, SCE performed ~231,000 pole clearances in 2020. This is a decrease from the reported ~233,900 figure reported in the WMP Progress Update 2020-12-31 submitted on 3/8/2021.

WMP Activities Summary

Inactive | Complete | Ahead of Plan | On Track | Behind Plan, Likely to Meet Year-end Goal | * Behind Plan, Substantially Complete

Situational Awareness Activities

Weather Stations

157%
installed

Weather Stations (SA-1)

Section 5.3.2.1 Page 104
Program Target: Install 375 Weather Stations. SCE will strive for installation of 475 Weather Stations subject to resource constraints and other execution risks

Status Update: ~590 of 375 weather stations installed. Exceeded WMP Program target and exceeded the strive target of 475 installations.

Fire Potential Index Phase II

Fire Potential Index (FPI) Phase II (SA-2)

Section 5.3.2.4.1 Page 107
Program Target: Refine the current FPI by integrating historical weather and vegetation data into the index

Status Update: Completed development of FPI 2.0 which factors in different fuel types (e.g. grass, timber, or brush) and historical weather data. Historical weather data was received in Q2. New fuel loading map and FPI 2.0 formulas were completed in Q4.

HPCC Weather Modeling System

High-Performing Computer Cluster (HPCC) Weather Modeling System (SA-3)

Section 5.3.2.6 Page 110
Program Target: Complete installation of second HPCC

Status Update: Completed the installation of second HPCC weather modeling system—It is in operational use.

Asset Reliability & Risk Analysis

Asset Reliability & Risk Analytics Capability (SA-4)

Section 5.3.2.7 Page 111
Program Target: Implement FireCast and FireSim modules of Technosylva

Status Update: Completed implementation of FireCast and FireSim applications and fire scientist training. Performed fire simulations in Q4.

Fuel Sampling Program

Fuel Sampling Program (SA-5)

Section 5.3.2.4.2 Page 108
Program Target: Perform updated fuel sampling in HFRA in areas deemed appropriate once every two weeks (weather permitting)

Status Update: Initiated fuel sampling in all four regions specified in the WMP (Inland Empire, North LA County, Eastern Sierra, Western Sierra). Fuel sampling continued in all four regions through year-end.

Surface and Canopy Fuels Mapping

Surface and Canopy Fuels Mapping (SA-6)

Section 5.3.2.4.3 Page 108
Program Target: Initiate surface and canopy fuels mapping across HFRA

Status Update: Vendor began work to refresh the fuels/surface canopy dataset in SCE territory in Q4. The program will improve fire spread modeling capabilities.

Remote Sensing / Satellite Fuel Moisture

Remote Sensing / Satellite Fuel Moisture (SA-7)

Section 5.3.2.4.4 Page 109
Program Target: Initiate procurement process for remote sensing technology for future implementation

Status Update: Procurement was initiated for a wind profiling pilot using LiDAR in the lower atmosphere of the Eastern Sierra. Contract was in the close to finalization by the end of 2020.

Fire Science Enhancements

Fire Science Enhancements (SA-8)

Section 5.3.2.4.5 Page 109
Program Target: Implement enhanced forecasting capability and improved fuel modeling

Status Update: Ensemble forecasting was implemented in Q3 and will increase the frequency of modeling to receive a range of outputs for forecasting.

WMP Activities Summary

Inactive | Complete | Ahead of Plan | On Track | Behind Plan, Likely to Meet Year-end Goal | * Behind Plan, Substantially Complete

Emergency Preparedness Activities

Dear Neighbor Letter

Customer Education and Engagement – Dear Neighbor Letter (DEP-1.1)

Section 5.3.9.2 Page 196

Program Target: Send ~915,000 letters with information about PSPS, emergency preparedness, and SCE's wildfire mitigation plan to customer accounts in HFRA and ~3,200,000 letters to customer accounts in non-HFRA

Status Update: Mailings have been completed to all customers (both HFRA and non-HFRA). COVID messaging was included in the newsletter along with contact information in 15 languages.

Community Meetings

Customer Education and Engagement – Community Meetings (DEP-1.2)

Section 5.3.9.2 Page 196

Program Target: Host 8-12 community meetings in areas impacted by 2019 PSPS plus other meetings including online as determined to share information about PSPS, emergency preparedness, and SCE's wildfire mitigation plan

Status Update: Nine virtual Community Meetings were held by the end of Q2. No additional Community Meetings were planned in 2020.

Marketing Campaign

Customer Education and Engagement – Marketing Campaign (DEP-1.3)

Section 5.3.9.2 Page 196

Program Target: Marketing campaign to reach 5,000,000 Customer Accounts (goal of 40% awareness about the purpose of PSPS, emergency preparedness, and SCE's wildfire mitigation plan)

Status Update: The 2020 marketing campaign was launched in May and SCE tracked PSPS and emergency awareness throughout the year. Average monthly awareness throughout 2020 was ~56%.

SCE Emergency Response Training

SCE Emergency Response Training (DEP-2)

Section 5.3.9.1 Page 194

Program Target: Hold SCE IMT member training on de-energization protocols, determine additional staffing needs and train, exercise and qualify new staff

Status Update: All annual trainings and exercises have been completed for 2020. The trainings and exercises were completed virtually as a result of COVID. Additional staffing for a permanent PSPS IMT have been hired.

IOU Customer Engagement

IOU Customer Engagement (DEP-3)

Section 5.3.9.2 Page 196

Program Target: Participate in statewide multichannel and multi-lingual campaign using digital ads, social media ads, and radio ads to provide customers with important and consistent messaging about wildfire mitigation activities happening across the state

Status Update: SCE has determined there is no need for a separate statewide customer engagement campaign in addition to SCE's local market campaign and informed CalOES of this change in direction. SCE further described this change in its June 1, 2020 Off-Ramp and September 11th Change Report. SCE's local PSPS education campaign launched in May 2020 across digital channels and continued throughout wildfire season.

Customer Research and Education

Customer Research and Education (DEP-4)

Section 5.3.9.2 Page 196

Program Target: Develop/implement various research activities that gauge customer awareness, preparedness for, and satisfaction with outage experiences; to include but not be limited to: town hall meetings, online & telephone surveys, focus groups, and assessments of programs & services to prepare customers before and after PSPS outages

Status Update: Town hall meetings were completed and a report summarizing findings was published. Online and telephone surveys were conducted on programs (e.g.,CRCs/CCVs). Assessments of customer preparations before and after PSPS outages were conducted through Voice of Customer surveys.

WMP Activities Summary

Inactive | Complete | Ahead of Plan | On Track | Behind Plan, Likely to Meet Year-end Goal | * Behind Plan, Substantially Complete

System Hardening Activities

Covered Conductor

137%
Circuit Miles Installed

Covered Conductor (SH-1)

Section 5.3.3.3.1 Page 118
Program Target: Install 700 circuit miles of covered conductor in HFRA. While 700 circuit miles is SCE's program target, SCE will strive to complete 1,000 circuit miles subject to resource constraints and other execution risks.

Status Update: ~960 of 700 circuit miles installed.

Undergrounding Overhead Conductor

Undergrounding Overhead Conductor (SH-2)

Section 5.3.3.16 Page 130
Program Target: Refine evaluation methodology for targeted undergrounding as a wildfire mitigation activity

Status Update: Team refined targeted undergrounding methodology and began scoping work for 2021.

Fire Resistant Poles

117%
Poles Installed

Fire Resistant Poles (SH-3)

Section 5.3.3.6.1 Page 121
Program Target: Replace 5,200 poles with fire resistant poles in HFRA. SCE will strive to replace 11,700 poles with fire resistant poles in HFRA subject to pole loading assessment results, resource constraints and other execution risks

Status Update: ~6,090 of 5,200 poles installed.

Branch Line Protection Strategy

100%
Locations

Branch Line Protection Strategy (SH-4)

Section 5.3.3.7 Page 123
Program Target: Install/replace fuses at 3,025 locations

Status Update: 3,025 of 3,025 locations installed/replaced fuses.

Install RAR/RCS

107%
RARs/RCSs Installed

Installation of System Automation Equipment – RAR/RCS (SH-5)

Section 5.3.3.9 Page 125
Program Target: Install 45 RARs/RCSs

Status Update: 49 RARs were reported as installed, however, only 48 were operationalized and end point tested by end of 2020.*

Circuit Breaker Relay Hardware for Fast Curve

167%
Installed

Circuit Breaker Relay Hardware for Fast Curve (SH-6)

Section 5.3.3.2.7 Page 118
Program Target: Replace/upgrade 55 relay units in HFRA. SCE will strive to replace up to 110 relay units in HFRA. These targets are subject to resource constraints and other execution risks.

Status Update: ~100 of 55 circuit breaker relays impacted to allow for 92 fast curve settings installed and placed into service.**

PSPS-Driven Grid Hardening Work

PSPS-Driven Grid Hardening Work (SH-7)

Section 5.3.3.8.1 Page 123
Program Target: Review 50% of all distribution circuits within HFRA to determine if modifications may improve sectionalizing capability within HFRA

Status Update: Review of all 550 in-scope distribution HFRA circuits was completed, and sectionalization and other grid-hardening (e.g. covered conductor) modifications were proposed.

Transmission Open Phase Detection

Transmission Open Phase Detection (SH-8)

Section 5.3.2.2.3 Page 106
Program Target: Continue deployment of transmission open phase detection on six additional transmission/subtransmission circuits

Status Update: All six circuits are in service and are under observation.

* 49 RARs were reported as installed in the WMP Progress Update 2020-12-31 submitted on 3/8/2021, however upon validation of records, only 48 were operationalized and end point tested by end of 2020. One of the 48, was installed and operationalized in 2019, however, not reported in the 2019 WMP due to timing.
**Following validation of records, 100 of 55 circuit breaker relays were impacted to allow for 92 fast curve settings installed and placed into service. This is a decrease of 8 from what was published in the WMP Progress Update 2020-12-31 on 3/8/2021.

WMP Activities Summary

Inactive | Complete | Ahead of Plan | On Track | Behind Plan, Likely to Meet Year-end Goal | * Behind Plan, Substantially Complete

System Hardening Activities

Transmission Overhead Standards

Transmission Overhead Standards (TOH) Review (SH-9)

Section 5.3.3.18 Page 132

Program Target: Review transmission standards to determine if there are any changes that can be made to help reduce wildfire threats, especially during extreme wind events

Status Update: Completed review of historical transmission outage data and identified several recommended updates for TOH standards that will be adopted in 2021.

Tree Attachment Remediation

123%
Remediated

Tree Attachment Remediation (SH-10)

Section 5.3.3.3.2 Page 120

Program Target: Remediate 325 tree attachments. SCE will strive to complete 481 tree attachment remediations subject to resource constraints and other execution risks

Status Update: ~400 tree attachments were remediated in 2020, exceeding the WMP target. The majority, 369, of these tree attachments were scoped for future years (e.g., 2021) but were removed as a result of wildfires in the second half of the year. Documentation for this methodology and rationale was captured in the 2021 WMP Update to the WSD.

Legacy Facilities

Legacy Facilities (SH-11)

Section 5.3.3.19 Page 132

Program Target: Evaluate risk, scope, and alternatives for identified circuits; evaluation of additional system hardening mitigation for wildlife fault protection and grounding/lightning arresters

Status Update: Risk evaluations on hydro control circuits and grounding study reports on two high priority sites were completed in December. Risk evaluations for low voltage sites were completed in November. Wildlife risk evaluation was completed in July.

Remediation – Distribution

Remediations - Distribution (SH-12.1)

Section 5.3.3.12.1 Page 127

Program Target: Remediate 100% of notifications with ignition risk in accordance with CPUC requirements, non-inclusive of notifications which meet the criteria of a valid exception

Status Update: Substantially complete. As of the end of December, Distribution Remediation finished at 97% complete, missing the WMP Program target of 100%. Prior to year-end Distribution Remediations were at risk of not meeting the goal due to resource diversion to restoration efforts from catastrophic fires and other precautions taken due to record dry fuel conditions. COVID related restrictions on outages, and PSPS activations also continually delayed and slowed work throughout the year.

Remediations – Transmission

Remediations - Transmission (SH-12.2)

Section 5.3.3.12.2 Page 128

Program Target: Remediate 100% of notifications with ignition risk in accordance with CPUC requirements, non-inclusive of notifications which meet the criteria of a valid exception

Status Update: Substantially complete. As of the end of December, Transmission Remediation finished at 95% complete, missing the WMP Program target of 100%. Prior to year-end Transmission Remediations were at risk of not meeting the goal due to resource diversion to restoration efforts from catastrophic fires and other precautions taken due to record dry fuel conditions. COVID related restrictions on outages also continually delayed and slowed work throughout the year.

Remediations – Generation

Remediations - Generation (SH-12.3)

Section 5.3.3.12.3 Page 129

Program Target: Remediate 100% of notifications with ignition risk in accordance with CPUC requirements, non-inclusive of notifications which meet the criteria of a valid exception

Status Update: Remediated 100% of generation notifications with ignition risk in accordance with CPUC requirements

WMP Activities Summary

Inactive | Complete | Ahead of Plan | On Track | Behind Plan, Likely to Meet Year-end Goal | * Behind Plan, Substantially Complete

Alternative Technologies Activities

MADEC

Alternative Technology Pilots - Meter Alarming for Downed Energized Conductor (MADEC) (AT-1)
Section 5.3.3.2.2 Page 115
Program Target: Evaluating algorithm improvements specific to the detection of downed energized covered conductor, which may behave differently than bare conductor

Status Update: SCE collected and analyzed meter alarm data to build an event database to enhance the MADEC algorithm. As of year-end, there were no meter alarms specific to downed, energized covered conductor to enhance the algorithm for this type of event. SCE anticipates it may take several years to collect enough datapoints for thorough analysis.

Distribution Fault Anticipation

Distribution Fault Anticipation (DFA) (AT-2.1)
Section 5.3.2.2.1 Page 106
Program Target: Evaluate technology performance on fault anticipation technology and future deployment

Status Update: An evaluation report of the performance of the 60 installed Distribution Fault Anticipation (DFA) units was completed in Q4. SCE also developed a 2021 deployment plan for additional DFA units.

Advanced UAS Study

Advanced Unmanned Aerial Systems Study (AT-2.2)
Section 5.3.4.9.2.1 Page 142
Program Target: Conduct additional Extended Visual Line of Sight (EVLOS) demonstration UAS flights using lessons learned from 2019 study and validate aerial patrol findings via truck, foot, or helicopter

Status Update: Despite the UAS team being diverted to support fire restoration efforts in Q4, the second round of UAS demonstration flights were successfully conducted with multiple vendors and validated by inspectors along a 11.5-mile segment.

Ground Fault Neutralizer

Alternative Technology Evaluations: Rapid Earth Fault Current Limiter – Ground Fault Neutralizer (GFN) (AT-3.1)
Section 5.3.3.2.3.1 Page 115
Program Target: Initiate engineering design and order equipment for a GFN field installation

Status Update: Final substation engineering and design for Ground Fault Neutralizers was released in December with construction scheduled to begin in Q1 2021. GFN equipment was received ahead of schedule in 2020.

Resonant Grounding

Alternative Technology Evaluations: Rapid Earth Fault Current Limiter – Resonant Grounding with Arc Suppression Coil (AT-3.2)
Section 5.3.3.2.3.2 Page 116
Program Target: Initiate engineering design to convert a typical substation to resonant grounding

Status Update: Final substation engineering and design for resonant grounded substation was released in December with construction scheduled to begin in Q2 2021.

Isolation Transformer

Alternative Technology Evaluations: Rapid Earth Fault Current Limiter – Isolation Transformer (AT-3.3)
Section 5.3.3.2.3.3 Page 116
Program Target: Install one Rapid Earth Fault Current Limiter - Isolation Transformer

Status Update: The Rapid Earth Fault Current Limiter - Isolation Transformer was successfully tested and commissioned in Q4.

WMP Activities Summary

Inactive | Complete | Ahead of Plan | On Track | Behind Plan, Likely to Meet Year-end Goal | * Behind Plan, Substantially Complete

Alternative Technologies Activities

Distribution Open Phase Detection

Alternative Technology Evaluations – Distribution Open Phase Detection (AT-3.4)

Section 5.3.3.2.4 Page 117

Program Target: Complete pilot installation for five circuit locations

Status Update: Distribution open phase detection logic has been deployed at five pilot locations as of mid-Q3. These locations have been in-serviced and are now in observation mode for alarming to validate and test the logic.

Partial Discharge Assessment

Assessment of Partial Discharge for Transmission Facilities (AT-6)

Section 5.3.4.10.2.1 Page 144

Program Target: Evaluate use of a Partial Discharge assessment technology to assess the health of in-service transmission assets

Status Update: Team conducted a benchmark assessment for Transmission Partial Discharge based on survey data, industry research, and engineering analysis. Team developed an assessment report with its findings and recommendations.

Vibration Dampers

Alternative Technology Implementation – Vibration Dampers (AT-4)

Section 5.3.3.3.3 Page 120

Program Target: Evaluate damper technologies for both small and large diameter covered conductor applications and develop standards for small and large diameter covered conductors

Status Update: SCE completed the evaluation of damper technologies and published new standards incorporating vibration damper applications for both large and small diameter covered conductor in Q4. SCE's analysis validated that dampers help prevent conductor strain.

Early Fault Detection Evaluation

Early Fault Detection (EFD) Evaluation (AT-7)

Section 5.3.2.2.2 Page 106

Program Target: Develop installation standards, install, and commission at least 10 EFD sensors. Gather data to determine requirements to support the potential for larger system deployments. SCE will strive to complete an additional 90 sensors for evaluation subject to resource constraints and other execution risks

Status Update: Team developed installation standards and completed field installation of 33 EFD units.

Asset Defect Detection Using

Asset Defect Detection Using Machine Learning Object Detection (AT-5)

Section 5.3.4.9.1.1 Page 140

Program Target: Begin standardization of data collection for Machine Learning (ML) by cataloging and tagging inspection imagery metadata for ML. Investigate SCE use cases and evaluate feasibility of ML to support objective evaluation of assets

Status Update: Documentation of 2020 machine learning findings began in December and is expected to be completed in Q1 2021. In 2020 SCE developed a process for collecting and tagging images to support machine learning model development and explored collaboration opportunities with a ML vendors.

High Impedance Relay Evaluations

High Impedance Relay Evaluations (AT-8)

Section 5.3.3.2.5 Page 117

Program Target: Investigate and deploy two controllers/relays with a High Impedance (Hi-Z) element in HFRA

Status Update: SCE installed high impedance elements at two distribution pilot locations in Q3. SCE is monitoring these installations in "alarm" mode to validate that the alarm logic is working as expected.

WMP Activities Summary

Inactive | Complete | Ahead of Plan | On Track | Behind Plan, Likely to Meet Year-end Goal | * Behind Plan, Substantially Complete

Inspections Activities

Distribution HFRII in HFRA

190%
structures inspected

Distribution High Fire Risk Informed Inspections (HFRII) in HFRA (IN-1.1)*
Section 5.3.4.9.1 Page 139
Program Target: Inspect 105,000 structures in HFRA

Status Update: ~199,000 of 105,000 structures inspected in HFRA.

Distribution Infrared Inspections

Infrared Inspection of Energized Overhead Distribution Facilities and Equipment (IN-3)
Section 5.3.4.4 Page 137
Program Target: Inspect 50% of distribution circuits in HFRA

Status Update: Completed goal of inspecting 50% of distribution circuit miles in HFRA in Q4.

Transmission HFRII in HFRA

158%
structures inspected

Transmission High Fire Risk Informed Inspections (HFRII) in HFRA (IN-1.2)*
Section 5.3.4.10.1 Page 143
Program Target: Inspect 22,500 structures in HFRA

Status Update: ~35,500 of 22,500 structures inspected in HFRA.

Transmission Infrared Inspections

Infrared Inspection, Corona Scanning, and High Definition Imagery of Energized Overhead Transmission facilities and Equipment (IN-4)
Section 5.3.4.5 Page 138
Program Target: Inspect 1,000 transmission circuit miles in HFRA

Status Update: 1,000+ circuit miles inspected in HFRA.

Quality Oversight / Quality Control

116%
structures inspected

Quality Oversight / Quality Control (IN-2)
Section 5.3.4.14 Page 146
Program Target: Perform quality control and oversight of inspections of 15,000 transmission, distribution, and generation structures in HFRA

Status Update: Performed quality control on ~17,400 of 15,000 structures in HFRA.

Generation HFRII in HFRA

Generation High Fire Risk Informed Inspections in HFRA (IN-5)
Section 5.3.4.16 Page 147
Program Target: Perform inspection of 200 generation-related assets

Status Update: ~290 of 200 structures inspected in HFRA.

* The Change Report filed in September 2020 describes that SCE plans to inspect ~165,000 distribution and ~33,500 transmission structures in HFRA in 2020.

WMP Activities Summary

Inactive | Complete | Ahead of Plan | On Track | Behind Plan, Likely to Meet Year-end Goal | * Behind Plan, Substantially Complete

Inspections Activities

Aerial Inspections – Distribution
102%
structures inspected

Aerial Inspections - Distribution (IN-6.1)

Section 5.3.4.9.2 Page 141
Program Target: Inspect 165,000 structures in HFRA

Status Update: ~168,000 of 165,000 structures inspected in HFRA. The start of 2020 aerial inspections were delayed due to COVID restrictions preventing aerial inspectors from accessing the on-site inspection room. Restarted inspections in Q2. Catastrophic fires and environmental factors (visibility, winds, heat) in the second half of the year caused inspection progress to slow, but the goal of 165,000 distribution structures in HFRA was met.

Aerial Inspections – Transmission
94%
structures inspected

Aerial Inspections - Transmission (IN-6.2)

Section 5.3.4.10.2 Page 144
Program Target: Inspect 33,500 structures in HFRA

Status Update: Substantially complete**.** ~31,380 of 33,500 structures inspected in HFRA.
The start of 2020 aerial inspections were delayed due to COVID restrictions preventing aerial inspectors from accessing the on-site inspection room. Restarted inspections in Q2. Catastrophic fires and environmental factors (visibility, winds, heat) in the second half of the year caused inspection progress to slow. FAA flight restrictions in sensitive areas (government, wildlife) prevented a portion of scope from being captured.

Failure Modes and Effects Analysis

Failure Modes and Effects Analysis (IN-7)

Section 5.3.4.15.1 Page 147
Program Update: Complete FMEA study for substation assets in HFRA and prepare final report

Status Update: The working group began developing FMEA risk identification in Q2 and completed it in Q3. The final assessment report, documenting the findings and recommendations, was completed in Q4.

Appendix

Behind Plan Activities Details

WMP Activities Details

Behind Plan Activities

Inactive | Complete | Ahead of Plan | On Track | Behind Plan, Likely to Meet Year-end Goal | * Behind Plan, Substantially Complete

Status	Current Goal	Narrative
	OP-3: Unmanned Aerial (UAS) Operations Training **Increase the number of UAS operators (FAA certified drone pilot) by an additional 50 crews**	**Summary:** As of the end of December, 42 resources had passed the FAA 107 exam. FAA-contracted testing centers were closed until July due to COVID shutdowns.* **Progress:** • 42 resources attempted and passed the FAA exam (100% pass rate) – Of these, 30 resources passed the exam in Q4 • SCE held three training courses in September and October to help employees prepare for the FAA 107 certification exam **Risks or Challenges:** • FAA 107 exams need to be taken in-person at designated testing centers. These testing centers were closed from March until July due to COVID shutdowns. • Employees within the Transmission and Distribution organizations have been highly impacted by PSPS constraining their ability to study, schedule and sit for the FAA 107 exam by year-end 2020. **Actions to Improve Performance / Get Well Plan:** • Planning for 2021 certifications and tracking an additional 8 resources to take and pass the FAA exam

* Following validation of records, 42 persons completed UAS 107 training and FAA certification in 2020. This is a decrease of 1 from what was published in the WMP Progress Update 2020-12-31 on 3/8/2021.

WMP Activities Details

Behind Plan Activities

Inactive | Complete | Ahead of Plan | On Track | Behind Plan, Likely to Meet Year-end Goal | * Behind Plan, Substantially Complete

Status	Current Goal	Narrative
	SH-12.1: Distribution Remediations **Remediate 100% of notifications with ignition risk in accordance with CPUC requirements, non-inclusive of notifications which meet the criteria of a valid exception**	**Summary:** As of the end of December, Distribution Remediation finished at 97% complete, missing the WMP Program target of 100%. Prior to year-end, Distribution Remediations were at risk of not meeting the goal due to resource diversion to restoration efforts from catastrophic fires and other precautions taken due to record dry fuel conditions. COVID-related restrictions on outages, and PSPS activations also continually delayed and slowed work throughout the year. **Progress**: • Two regions completed 100% of their 2020 notifications. Remaining regions will complete 2020 notifications in 2021. **Risks or Challenges**: • Timely remediation of notifications was impacted in August and September due to unforeseen constraints from catastrophic fires including resource diversion to fire restoration efforts. • Other precautions were taken due to record dry fuel conditions, which further diverted resources away from WMP scope. • COVID restrictions and PSPS activations delayed and/or disallowed outages in many areas, impacting ability to safely perform work timely and maintain production **Actions to Improve or Sustain Performance:** • Detailed line-by-line analysis of the outstanding 2020 notifications is being conducted to help all Regions clear remaining obstacles to completion

WMP Activities Details

Behind Plan Activities

Inactive | Complete | Ahead of Plan | On Track | Behind Plan, Likely to Meet Year-end Goal | * Behind Plan, Substantially Complete

Status	Current Goal	Narrative
	SH-12.2: Transmission Remediations **Remediate 100% of notifications with ignition risk in accordance with CPUC requirements, non-inclusive of notifications which meet the criteria of a valid exception**	**Summary:** As of the end of December, Transmission Remediation finished at 95% complete, missing the WMP Program target of 100%. Prior to year-end, Transmission Remediations were at risk of not meeting the goal due to resource diversion to restoration efforts from catastrophic fires and other precautions taken due to record dry fuel conditions. COVID related restrictions on outages also continually delayed and slowed work throughout the year. **Progress**: • SCE completed almost all Right of Way (ROW) notifications in 2020, an improvement from 2019 • The two Grids with the most remaining 2020 notifications were North Coast and San Joaquin. **Risks or Challenges**: • Timely remediation of notifications was impacted in August and September due to unforeseen constraints from catastrophic fires including resource diversion to fire restoration efforts. • Other precautions were taken due to record dry fuel conditions, which further diverted resources away from WMP scope. • As with Distribution Remediations (12.1), COVID restrictions and PSPS activations delayed and/or disallowed outages in many areas, impacting ability to safely perform work timely and maintain production **Actions to Improve or Sustain Performance:** • Line-by-line analysis of the outstanding 2020 notifications is being done to help all Regions clear remaining obstacles to completion.

WMP Activities Details

Behind Plan Activities

Inactive | Complete | Ahead of Plan | On Track | Behind Plan, Likely to Meet Year-end Goal | * Behind Plan, Substantially Complete

Status	Current Goal	Narrative
	IN-6.2: Aerial Inspections – Transmission **IN-6.2: Inspect 33,500 structures in HFRA**	**Summary**: As of the end of December, aerial inspections have been completed on ~31,380 transmission structures in HFRA. This is ~6% short of the WMP Goal of 33,500. **Progress**: • In Q4, inspections were completed on an additional ~9,080 structures in HFRA. **Risks or Challenges**: • COVID shutdowns had several impacts throughout 2020. The initial March shutdown caused delays in planning and starting inspections as the team adjusted to working from home and social distancing requirements. Image capture was also impacted by equipment delays at the border and drone crews being deployed back to home states. • The aerial team faced challenges in collection of scope for several additional reasons: – Inability to complete full inspections based on imagery provided by vendor – Inability to access structures (limited access routes on foot, military restrictions, U.S. Forest Service work restrictions during fire season) – FAA Temporary Flight Restrictions (TFR), specifically in air space surrounding active fires – Internal master data inconsistencies **Actions to Improve or Sustain Performance**: • The aerial team is in the process of evaluating structures that were not completed or partially completed in 2020 to determine which structures can be rolled over for inspection in 2021 and which structures are unlikely to be captured from the air due to a permanent condition (e.g., geographical restrictions). • In 2021 the aerial team is targeting inspections to start earlier in the year (e.g., Q1 2021) to make greater progress ahead of fire season.

Attachment B: SCE 2021 WMP Updated Supplemental Filing (February 21, 2021) - Response to WMP Class B Deficiency Action Statements Guidance-5, Aggregation of initiatives into programs

WMP Class B Deficiency Action Statements
Guidance-5, Aggregation of initiatives into programs

Action SCE-5: *In its 2021 WMP Update, SCE shall: 1) provide a timeline and status update for when it intends to develop quantitative evaluations for each initiative, including the status of threshold values, 2) explain why any initiatives listed in Tables 2 through 10 of the QR would not be applicable for threshold values, and 3) explain what subject matter expert (SME) expertise is being used for in the development of each quantitative value and threshold.*

Response:
SCE has identified five categories of key portfolio-level effectiveness metrics (described in its response to Guidance-5 and in SCE's 2021 WMP Update) by which most of its WMP activities may be evaluated. These effectiveness metrics proposed by SCE are:

- CPUC reportable ignitions in HFRA (total and by key drivers such as CFO, wire-to-wire, Tree Caused Circuit Interruptions, equipment failure)
- Faults in HFRA (total and by key drivers mentioned above)
- Wire down incidents in HFRA (total and by key drivers mentioned above)
- Number of customers and average duration of PSPS events
- Timeliness and accuracy of PSPS notifications

In response to Guidance 5, on September 9, 2020, SCE included all the activities in its 2020 WMP and provided effectiveness metrics for each initiative separately. In response to this Action Statement, SCE is updating its response in two ways. First, SCE is updating the response provided in Guidance 5 to reflect the 39 activities included in its 2021 WMP Update to stay consistent with the current WMP and account for new activities and eliminated activities already completed or transitioned to routine operations. SCE provided a mapping of its 2020 activities to 2021 activities in Appendix 9.3 in its 2021 WMP Update submitted on February 5, 2021. Second, SCE has linked each activity to the portfolio level key effectiveness metrics to the extent feasible as improvement in these activities is the eventual goal of our WMPs.

The 39 WMP activities are described in Table G5-SCE5-1. Also, in Table G5-SCE5-1, along with SCE's description of each activity and their 2021 program targets, SCE describes which of the five effectiveness metrics relate to the activity. The 'Quantitative Evaluation' column provides initial methods SCE may employ to measure effectiveness and thresholds thereof, subject to further refinement. As SCE analyzes the effectiveness of the WMP activities, if there are other metrics that are materially impacted, SCE will address those in future updates.

In response to parts (1) and (2) of this Action Statement, SCE notes that for all 39 WMP activities described in the Table, quantifying actual mitigation effectiveness is a complex effort that requires availability of accurate and consistent data on ignition drivers, calculation methods to be developed and normalized for weather and other exogenous factors to facilitate meaningful conclusions, and tested methods. Sufficient time is necessary to evaluate and validate real-world field performance of the mitigations over a meaningful time-period. SCE plans to build, test, and refine methods to develop threshold values for effectiveness of each of the WMP initiatives throughout Q4 2021 and will include these findings in its 2022

WMP Update. Evaluation of the initiatives themselves will occur after a sufficient volume of work has been deployed and sufficient time has passed since deployment to evaluate pre- and post-deployment changes in effectiveness metrics. For example, though covered conductor has been deployed in many areas of SCE's HFRA, we have less than two years of data which translates to very few or no incidents on any particular segment making it challenging to compare overhead conductor performance prior to and after covered conductor installation, especially when uncontrollable environmental factors are accounted for. To account for anomalies related to grid conditions, weather events, and other externalities, these results must be measured and evaluated over time. While SCE is continuing to evaluate the effectiveness of its WMP activities after deployment, SCE suggests that results may require at least 3 years of mitigation deployment in order to adequately account for these factors. Therefore, the evaluation of initiatives will be an annual exercise for SCE, with continual refinements in the measurement approaches. Finally, for those where the portfolio effectiveness metrics cannot be applied, such as digital or work management tools, SCE has provided an explanation in the Quantitative Evaluation column of the activity's role with respect to other WMP activities.

SCE has been actively investigating ways to measure and evaluate effectiveness and offers initial thoughts in the 'Quantitative Evaluation' column of the table. SCE will build upon these efforts to develop more robust and repeatable methods for assessing effectiveness in 2021. SCE also intends to investigate approaches to gauge effectiveness in targeting and deploying wildfire mitigations to the highest risk areas. An important component of these efforts will be to benchmark with other utilities and organizations on best practices and methods. For most initiatives, SCE is in the process of evaluating the appropriate methods to quantify effectiveness for each initiative, and therefore thresholds have not yet been set. Finally, SCE would appreciate the opportunity to partner with WSD in this effort and suggests that a workshop be held in early Q3 of this year to share our progress and obtain feedback from WSD in advance of the 2022 WMP Update.

Within the attached table, for those WMP initiatives which SCE has risk-scored in the 2021 WMP Update, SCE provides estimates of expected effectiveness based on the risk and RSE analysis. These are not equivalent to threshold metrics as the WMP activities are potentially effective even if they provide lesser benefits than expected. For example, though our engineering judgment might say that covered conductor is 99% effective in reducing faults associated with a particular driver, 70-80% effectiveness in reducing faults would still be a significant improvement over bare conductor performance. SCE intends to utilize these risk-informed measurements to continuously refine the assumptions that are used to model the mitigation effectiveness of each initiative, and to help inform future levels and scope of deployment of the mitigation.

3) Subject Matter Expertise: SCE has used and is continuing to use the expertise of various resources to develop the methodology by which to quantify effectiveness, perform those calculations, and establish associated thresholds. This includes:

- Engineering and technical experts associated with each initiative who are experts in how each technology performs;
- Risk modelers and data scientists with expertise in statistical analysis and evaluation who help build and calculate quantitative metrics and thresholds;
- Performance management professionals who track performance following deployment of activities and align metrics and threshold values to evaluate effectiveness;

- Customer service professionals who evaluate customers awareness, understanding and gauge satisfaction with programs intended to reduce PSPS impacts to customers;
- Meteorology and weather professionals who use advanced tools and models to evaluate and forecast weather conditions; and
- Other SMEs as needed.

Table G5-SCE5-1

Activity #	Initiative / Activity	Projected Target by End of 2021	Describe the effectiveness of each initiative at reducing ignition probability or wildfire consequence	Metrics Impacted	Quantitative Evaluation
SA-1	Weather Stations	SCE expects to install 375 weather stations but will attempt to install as many as 475	Information from weather stations directly provide localized data on wind speed and FPI which are two of the factors which inform PSPS trigger thresholds and affect when PSPS events are called. Data from additional weather stations helps improve weather forecasting capabilities at a circuit and sub-circuit level. Additionally, by installing weather stations on specific segments of circuits, SCE is able to monitor and forecast weather at higher granularity that in turn can help decisions to sectionalize circuits and reduce the scope of PSPS events to fewer circuit segments. This improves the # of impacted customer and average duration, and timeliness and accuracy of PSPS notifications.	- Number of customers impacted and average duration of PSPS events - Timeliness and accuracy of PSPS notifications	SCE intends to measure the effectiveness of weather stations in improving the accuracy of weather models that drive PSPS de-energization decisions. The model results from the weather station installations will be compared with the model results from the alternative, which is to use Live Field Observations (LFO) to measure weather. The comparison will be used to draw conclusions about the effectiveness of this activity before and after deployment of additional weather stations. SCE intends to utilize data from 2018 to compare current and future years to measure the improvements in restoration time and duration over time. See parts (1) and (2) of action statement for evaluation timeline.
SA-2	Fire Potential Index (FPI)	1) Backcast 20 years of FPI using FPI 2.0 before typical height of fire season (Q3) to determine historical performance compared to current FPI 2) Run FPI 2.0 in parallel with the current FPI and compare outputs for the 2021 fire season	FPI estimates conditional fire potential at the circuit level; as accuracy of the FPI increases, it will lead to improvements in the accuracy, timeliness, and precision of PSPS decision making. By integrating historical weather and vegetation data into the FPI, SCE will improve the accuracy of this index which is a direct input into PSPS decision making. This will better inform PSPS decision-making by better estimating the potential risk of fire ignition and spread at the PSPS circuit level. Accurate FPI improves timeliness and accuracy of PSPS notifications to help better identify areas in scope for a PSPS event by more accurately targeting the number of circuits in scope and, hence, reducing number of customers who may need to be de-energized.	- Number of impacted customers and average duration of PSPS events - Timeliness and accuracy of PSPS notifications	SCE intend to measure the effectiveness of the new FPI by comparing the historical performance of new and current FPI for critical and non-critical events by the end of Q3 2021; the results will be leveraged to validate or calibrate the FPI equations appropriately. Accurate FPI improves timeliness and accuracy of PSPS notifications to help better identify areas in scope for a PSPS event by more accurately targeting the number of circuits in scope and, hence, reducing the number of customers who may need to be de-energized (SCE anticipates updating the risk model ties to this metric by end of Q1 2022). See parts (1) and (2) of action statement for evaluation timeline.
SA-3	Weather and Fuels Modeling	Install two additional High-Performance Computing Clusters (HPCCs) to facilitate the installation and operationalization of the Next Generation Weather Modeling System allowing for more precise, higher resolution output	The installation of two additional HPCCs will enable SCE to produce ensemble forecast output at a 1 km resolution. This improved granularity ensemble output will provide SCE with more accurate forecasts of wind speed and FPI at the circuit level, which will ultimately improve the decision making of PSPS.	- Number of impacted customers and average duration of PSPS events - Timeliness and accuracy of PSPS notifications	As the Weather and Fuels Modeling will double the resolution of SCE's weather modeling, SCE intends to measure the effectiveness of this initiative by comparing the accuracy of forecasts of wind speed and FPI at the circuit level at 2km versus 1km. This would impact the number of de-energization circuits in scope and the number of customers impacted who may not need to be de-energized due to lower resolutions. See parts (1) and (2) of action statement for evaluation timeline.
SA-4	Fire Spread Modeling	Develop a methodology and a strategy to test FireCast/FireSim implementation into PSPS decision making based on backcast information by Q3	The Technosylva products allow SCE to simulate "what if scenarios" to predict various fire ignition and consequence outputs such as fire perimeter size, structures impacted, populations affected, injury and death, etc. This output will help SCE coordinate response during active wildfire events and may be used as an input to inform PSPS decision making.	- Number of impacted customers and average duration of PSPS events - Timeliness and accuracy of PSPS notifications	SCE intends to measure the effectiveness of Fire Spread Modeling in improving timeliness and accuracy of PSPS notifications by evaluating how fire spread calculations would have affected de-energization decisions made historically (evaluations expected to be implemented by the start of Q3 2021). SCE intends to utilize the output to calibrate de-energization decisions as needed by end of Q3 2021. Similar to SA-2 and SA-3, this activity increases granularity to improve identification of areas in scope for a PSPS event, which will affect accuracy of PSPS notifications and number of customers de-energized. See parts (1) and (2) of action statement for evaluation timeline.
SA-5	Fuel Sampling Program	Maintain periodic fuel sampling across SCE's HFRA and evaluate the need to sample additional locations	This semi real-time measurements of vegetation moisture for 15 sites is an additional input which helps calibrate FPI which in turn increases the precision of PSPS decision making. This data can also be used to adjust inputs for fire spread calculations which will help improve the accuracy of fire consequence modeling.	- Number of impacted customers and average duration of PSPS events - Timeliness and accuracy of PSPS notifications	SCE plans to track observed live fuel moisture to make appropriate adjustments to the FPI. SCE intends to measure the effectiveness of Fuel Sampling Program, by measuring the FPI accuracy before and after the live fuel moisture from the Fuel Sampling Program is incorporated, in impacting the accuracy of PSPS notifications and the number of customers impacted by a PSPS event. See parts (1) and (2) of action statement for evaluation timeline.
SA-7	Remote Sensing / Satellite Fuel Moisture	Initiate wind profiler pilot project to validate weather model performance for potential improvements to weather models	While this initiative does not reduce ignition risk or consequence directly, it enhances SCE's overall capability in our risk modeling and has the potential to improve FPI which is a direct input to PSPS decision making. Additionally, it can help improve Technosylva's fire consequence models that can help better target and prioritize WMP deployment.	- Number of impacted customers and average duration of PSPS events - Timeliness and accuracy of PSPS notifications	SCE intends to measure the effectiveness of Remote Sensing in improving real-time de-energization decisions, by comparing the accuracy before (using in-house weather model forecasts) and after the implementation of the pilot to develop site-specific information about winds. This activity directly impacts the number of impacted customers and imminent notifications. See parts (1) and (2) of action statement for evaluation timeline.

Activity #	Initiative / Activity	Projected Target by End of 2021	Describe the effectiveness of each initiative at reducing ignition probability or wildfire consequence	Metrics Impacted	Quantitative Evaluation
SA-8	Fire Science Enhancements	Evaluate current wildfire events in context of 40-year history of wildfires	While this initiative does not reduce ignition risk or consequence directly, it will help put current events into a historical perspective.	- Number of impacted customers and average duration of PSPS events - Timeliness and accuracy of PSPS notifications	SCE intends to measure the effectiveness of Fire Science Enhancements in improving the accuracy of the PSPS event. This will help to better understand a PSPS event (whether typical or anomaly), given the historical context. Initial results are expected by the end of Q4 2021. See parts (1) and (2) of action statement for evaluation timeline.
SA-9	Distribution Fault Anticipation (DFA)	Complete installation of 120 DFA units on circuits in SCE's HFRA and continue evaluation of DFA technology which may result in SCE installing up to 150 units	DFA systems have the potential to provide awareness of arcing events and draw attention to unique fault events which may be precursors to future fault events using electrical signatures. Early detection to allow time to take proactive remedial action(s) is expected to reduce faults, potential ignitions, and indirectly reduce wire down events as a proportion of faults reduced.	- CPUC reportable ignitions in High Fire Risk Area (HFRA) - Faults in HFRA - Wire down incidents in HFRA	SCE intends to measure the number of incidences of each of these metrics for risk drivers that DFA is effective in mitigating (e.g. CFO-driven faults, wire downs and ignitions) in the areas where DFA has been deployed, prior to and after deployment of DFA. See parts (1) and (2) of action statement for evaluation timeline. In addition, DFA reduces risk across specific sub-drivers that cause ignitions. Based on SCE's risk modeling used in the 2021 WMP Update, SCE estimates the overall mitigation effectiveness of this activity to be approximately 2% against the overall set of ignition-causing risk drivers, assuming deployment across HFRA.
SH-1	Covered Conductor	SCE expects to install 1,000 circuit miles of covered conductor in SCE's HFRA but will attempt to install as many as 1,400 circuit miles of covered conductor in SCE's HFRA, subject to resources constraints and other execution risks	Covered conductor is anticipated to significantly reduce contact-from-object and wire-to-wire ignition risks as well as indirectly reduce the frequency of wire down events by reducing the number of faults. CC deployment on an entire circuit segment impacts the PSPS threshold, but only when installed on an entire segment	- CPUC reportable ignitions in HFRA - Faults in HFRA - Wire down incidents in HFRA - Number of impacted customers and average duration of PSPS events	SCE intends to measure the number of incidences of each of these metrics for risk drivers that covered conductor is effective in mitigating (e.g. CFO-driven faults, wire downs and ignitions) in the areas where covered conductor has been deployed, prior to and after deployment of covered conductor. See parts (1) and (2) of action statement for evaluation timeline. In addition, covered conductor (and fire resistant poles) reduces risk across specific sub-drivers that cause ignitions. Based on SCE's risk modeling used in the 2021 WMP Update, SCE estimates the overall mitigation effectiveness of this activity to be approximately 66% against the overall set of ignition-causing risk drivers, assuming deployment across HFRA. SCE intends to measure the ability for covered conductor to reduce the number of customers impacted and the average duration of PSPS events by comparing a circuit prior to and after SCE has fully covered that circuit or circuit segment with covered conductor. In order for SCE to increase the wind thresholds by which PSPS de-energization events are called, an entire circuit segment must be covered. SCE anticipates completely covering numerous isolatable circuit segments and circuits that are within PSPS deenergization scope in 2021. Therefore, SCE expects to be able to show actual results of the effectiveness of this mitigation after such time as the circuit is completely covered and there are potential PSPS events on that circuit that can incorporate these updated thresholds.
SH-2	Undergrounding Overhead Conductor	Install 4 miles of undergrounded HFRA circuits SCE will attempt to install 6 miles of undergrounded HFRA circuits, subject to resource constraints and other execution risks, such as permitting, environmental or coordinating with other utilities	Undergrounding is expected to nearly eliminate faults and ignitions associated with overhead distribution lines where deployed.	- CPUC reportable ignitions in HFRA - Faults in HFRA - Wire down incidents in HFRA - Number of impacted customers and average duration of Public Safety Power Shutoff events	SCE intends to measure the number of incidences of each of these metrics for risk drivers that underground construction is effective in mitigating (e.g. CFO-driven faults, all wire downs and all ignitions) in the areas where undergrounding facilities has been deployed, prior to and after deployment of the undergrounding construction. See parts (1) and (2) of action statement for evaluation timeline. In addition, undergrounding reduces risk across specific sub-drivers that cause ignitions. Based on SCE's risk modeling used in the 2021 WMP Update, SCE estimates the overall mitigation effectiveness of this activity to be approximately 91% against the overall set of ignition-causing risk drivers, assuming deployment across HFRA. SCE expects undergrounding to be fully effective in mitigating PSPS de-energization events on circuits that are fully undergrounded, removing them from PSPS deenergization scope. SCE is currently evaluating locations that may be within scope for PSPS.
SH-4	Branch Line Protection Strategy	Install or replace fusing at 330 fuse installation locations SCE will strive to install or replace fusing at 421 locations, subject to resource constraints and other execution risks	Ignition probability is expected to be reduced by the installation of branch line circuit protection, such as current limiting fuses. As described in the WMP Section 5.3.3.17, the fusing program is intended to reduce the risk of fire ignitions associated with SCE's distribution lines and equipment by reducing fault energy.	- CPUC reportable ignitions in HFRA - Wire down incidents in HFRA	SCE intends to measure the number of incidences of each of these metrics that current limiting branch line protection/fuses are effective in mitigating (e.g. ignitions caused by equipment failure by replacing existing fuses with new current limiting fuses) in the areas where current limiting fuses have been deployed, prior to and after deployment of current limiting fuses. See parts (1) and (2) of action statement for evaluation timeline. In addition, current limiting fuses reduce risk across specific sub-drivers that cause ignitions. Based on SCE's risk modeling used in the 2021 WMP Update, SCE estimates the overall mitigation effectiveness of this activity to be approximately 4% against the overall set of ignition-causing risk drivers, assuming deployment across HFRA.
SH-5	Installation of System Automation Equipment – RAR/RCS	N/A – If RARs/RCSs are determined to be necessary based on the SH-7 analysis, SCE will develop appropriate project plans	As stated in the WMP Section 5.3.3.9, SCE is expanding its system automation equipment strategy to target both RARs and additional sectionalizing devices such as RCSs to provide important isolating capabilities that could minimize the frequency of customer outages during PSPS and other outage events.	- Number of impacted customers and average duration of PSPS events - Timeliness and accuracy of PSPS notifications	SCE expects automation equipment to provide important isolating capabilities that could minimize the frequency and duration of PSPS deenergization events for customers. At this time, SCE is determining the 2021 scope for RARs/RCS based upon SH-7 analysis, and currently there is no 2021 target for deployment.

Activity #	Initiative / Activity	Projected Target by End of 2021	Describe the effectiveness of each initiative at reducing ignition probability or wildfire consequence	Metrics Impacted	Quantitative Evaluation
SH-6	Circuit Breaker Relay Hardware for Fast Curve	Replace/upgrade 60 relay units in HFRA SCE will strive to replace/upgrade 86 relay units in HFRA, subject to resource constraints and other execution risks	Reducing fault current duration will reduce arcing and fault energy helping reduce wildfire ignition risk.	- CPUC reportable ignitions in HFRA - Wire down incidents in HFRA	SCE activates Fast Curve relay settings during elevated fire risk conditions that generally vary based on weather conditions and other factors. SCE plans to further assess threshold values throughout 2021 for the SH-6 program. While we expect there is directional improvement for reducing wire down events, we have not established metrics in the wire down category. SCE intends to measure the number of incidences of each of these metrics that CB fast curve settings are effective in mitigating (e.g. ignitions and wire down events) prior to and after deployment of circuits with CB fast curve settings. See parts (1) and (2) of action statement for evaluation timeline. In addition, CB fast curve settings reduce risk across specific sub-drivers that cause ignitions. Based on SCE's risk modeling used in the 2021 WMP Update, SCE estimates the overall mitigation effectiveness of this activity to be approximately 4% against the overall set of ignition-causing risk drivers, assuming deployment across HFRA.
SH-7	PSPS-Driven Grid Hardening Work	SCE will develop a methodology to project probability of PSPS de-energization and impact. Utilizing this methodology, SCE will adopt a more targeted approach by evaluating highly impacted circuits from the remaining 50% circuits in HFRA (50% was completed in 2020). The outcome of this evaluation will identify mitigations/projects that could be implemented in other system hardening activities such as SH-1 and SH-5.	This initiative constitutes an evaluation and will not on its own reduce risk. The grid hardening projects recommended by SH-7 are expected to reduce PSPS frequency and scope	- Number of impacted customers and average duration of PSPS events	The effectiveness of this activity can only be measured when the recommendations by SH-7 are implemented. The effectiveness quantification of these recommendations is covered under SH-1, SH-2, and SH-5.
SH-8	Transmission Open Phase Detection	Install transmission open phase detection devices on 10 transmission circuits	By detecting and isolating lines prior to contacting ground when conductors and conductor related hardware (such as splices) fail, the TOPD system is expected to reduce ignition risk associated with wire down events.	- CPUC reportable ignitions in HFRA	The Transmission Open Phase Detection (TOPD) scheme will be implemented onto existing assets (Relays) for 10 Transmission lines residing within HFRA by Q4 of 2021. Upon implementation of said scheme, the TOPD will follow a 6-month evaluation period leading into Q2 of 2022. During the evaluation period, the Transmission line relays will be in Alarm mode only rather than trip mode. This approach will allow SCE to monitor the performance of our relay schemes while maintaining reliable operation of the network. In Q3 of 2022, with acceptable results from the TOPD scheme, SCE intends to configure the TOPD scheme to allow operational flexibility to transition between Alarm mode to Alarm/Trip mode when required. SCE is anticipating a 90% effectiveness rate for detection and isolation of separated conductor on the 10 targeted Transmission Line installations. However, it is important to recognize lower detection thresholds are also improvements over present systems which do not currently detect conductor separation events.
SH-10	Tree Attachment Remediation	Remediate 500 tree attachments; SCE will strive to complete over 600 tree attachment remediations, subject to resource constraints and other execution risks	Reducing tree attachments reduces the probability of conductors failing from compromised tree integrity or vegetation contact which in turn reduces the probability of ignitions.	- CPUC reportable ignitions in HFRA - Faults in HFRA - Wire down incidents in HFRA	SCE intends to measure the number of incidences of each of these metrics that tree attachment remediations are effective in mitigating (e.g. wire down events that are caused by failure of the tree attachment) in the areas where tree attachments have been remediated, prior to and after remediation of tree attachments. See parts (1) and (2) of action statement for evaluation timeline.
SH-11	Legacy Facilities	Hydro Control Circuits – Perform evaluation on 5 circuits for possible system hardening improvements Low Voltage Site Hardening – Create 2 project plans based on 2020 engineering assessments Grounding Studies/Lightning Arrestor Assessments: Complete 12 additional assessments	This initiative will identify system hardening at these facilities, which will reduce faults and in turn probability of ignitions.	- CPUC reportable ignitions in HFRA - Faults in HFRA - Wire down incidents in HFRA	SCE is currently evaluating legacy facilities for this activity and expects to complete the evaluation in 2022. Additional evaluation or threshold values would be established to align with the actions from the evaluation.
SH-12	Microgrid Assessment	Perform internal assessment of vendor bid and location options. If assessment is favorable, SCE will issue an engineering, procurement, construction (EPC) contract to a vendor that meets SCE's design requirements	This initiative does not directly reduce the probability or consequence of ignitions but can provide PSPS resilience to multiple customers in areas expected to be frequently impacted by PSPS.	- Number of impacted customers and average duration of PSPS events	The system will be evaluated by the reduction in customer minutes of interruption for the supported circuit. Evaluation will not begin until system is operational in 2022.

Activity #	Initiative / Activity	Projected Target by End of 2021	Describe the effectiveness of each initiative at reducing ignition probability or wildfire consequence	Metrics Impacted	Quantitative Evaluation
SH-13	C Hooks	Replace C-Hooks on at least 40 structures in HFRA SCE will strive to replace all C hooks in HFRA, currently estimated between 50-60 structures	Failure of a C-hook could lead to a risk event with ignition probability	- CPUC reportable ignitions in HFRA - Faults in HFRA - Wire down incidents in HFRA	SCE intends to measure the number of incidences of each of these metrics that C hook replacements are effective in mitigating in the areas where C hooks have been replaced, prior to and after replacement of C hooks. See parts (1) and (2) of action statement for evaluation timeline. In addition, C hook replacement reduces risk across specific sub-drivers that cause ignitions. Based on SCE's risk modeling used in the 2021 WMP Update, SCE estimates the overall mitigation effectiveness of this activity to be less than 1% against the overall set of ignition-causing risk drivers.
SH-14	Long Span Initiative (LSI)	Complete all field assessments for locations and corresponding remediations Remediate the highest risk locations, estimating that 300, and up to 600, locations will be remediated in 2021, subject to the completion timeline for inspections, resource constraints and other execution risks	Remediation of the highest-risk locations will reduce conductor clashing (wire-to-wire contact), and in turn the probability of ignitions	- CPUC reportable ignitions in HFRA - Faults in HFRA - Wire down incidents in HFRA	SCE intends to measure the number of incidences of each of these metrics that Long Span Initiative (LSI) is effective in mitigating in the areas where LSI has been deployed, prior to and after deployment of LSI. See parts (1) and (2) of action statement for evaluation timeline. In addition, LSI reduces risk across specific sub-drivers that cause ignitions. Based on SCE's risk modeling used in the 2021 WMP Update, SCE estimates the overall mitigation effectiveness of this activity to be approximately 7% against the overall set of ignition-causing risk drivers, assuming deployment across HFRA.
SH-15	Vertical Switches	Install 20 switches in HFRA SCE will strive to install 30 switches in HFRA	Replacement of vertical switches in HFRA targets reducing risk with vertical switch failure events which can produce incandescent particles, and therefore reduce the risk of ignitions that can lead to wildfires.	- CPUC reportable ignitions in HFRA - Faults in HFRA	SCE fault event data is extrapolated from outage events. The switch failures of concern many times occur when a downstream fault event occurs. This type of switch failure event commonly only produces a single outage scenario and therefore switch replacement may not have an appreciable change to outage or fault quantities. See parts (1) and (2) of action statement for evaluation timeline. SCE intends to measure the number of incidences of each of these metrics that vertical switches are effective in mitigating in the areas where vertical switches have been deployed, prior to and after deployment of vertical switches. In addition, vertical switches reduce risk across specific sub-drivers that cause ignitions. Based on SCE's risk modeling used in the 2021 WMP Update, SCE estimates the overall mitigation effectiveness of this activity to be approximately 2% against the overall set of ignition-causing risk drivers, assuming deployment across HFRA.
IN-1.1	Distribution High Fire Risk Informed Inspections in HFRA	Inspect between 163,000 and 198,000 structures in HFRA, via both ground and aerial inspections. This target includes HFRI, compliance-due structures in HFRA and emergent risks during the fire season	Inspections identify conditions in need of remediation (i.e. priority notifications), notifications are prioritized, and notifications are expected to be remediated before they fail and cause a fault/wire down/ignition. Inspections lead to remediations, and these remediations help reduce ignition probability factors.	- CPUC reportable ignitions in HFRA - Faults in HFRA - Wire down incidents in HFRA	SCE intends to measure the number of incidences of each of these metrics that Distribution OH inspections identify and are ultimately remediated to reduce risk ("Distribution OH Inspections & Remediations") are effective in mitigating in the areas where Distribution OH Inspections & Remediations have been completed, prior to and after completion of Distribution OH Inspections & Remediations. See parts (1) and (2) of action statement for evaluation timeline. In addition, Distribution OH Inspections & Remediations reduce risk across specific sub-drivers that cause ignitions. Based on SCE's risk modeling used in the 2021 WMP Update, SCE estimates the overall mitigation effectiveness of this activity to be approximately 37% against the overall set of ignition-causing risk drivers, assuming deployment across HFRA.
IN-1.2	Transmission High Fire Risk Informed Inspections in HFRA	Inspect between 16,800 and 22,800 structures in HFRA, via ground and aerial inspections. This target includes HFRI, compliance-due structures in HFRA and emergent risks during the fire season.	Inspections identify conditions in need of remediation (i.e. priority notifications), notifications are prioritized, and notifications are expected to be remediated before they fail and cause a fault/wire down/ignition. Inspections lead to remediations, and these remediations help reduce ignition probability factors.	- CPUC reportable ignitions in HFRA - Faults in HFRA - Wire down incidents in HFRA	SCE intends to measure the number of incidences of each of these metrics that Transmission OH inspections identify and are ultimately remediated to reduce risk ("Transmission OH Inspections & Remediations") are effective in mitigating in the areas where Transmission OH Inspections & Remediations have been completed, prior to and after completion of Transmission OH Inspections & Remediations. See parts (1) and (2) of action statement for evaluation timeline. In addition, Transmission OH Inspections & Remediations reduce risk across specific sub-drivers that cause ignitions. Based on SCE's risk modeling used in the 2021 WMP Update, SCE estimates the overall mitigation effectiveness of this activity to be approximately 3% against the overall set of ignition-causing risk drivers, assuming deployment across HFRA.

Activity #	Initiative / Activity	Projected Target by End of 2021	Describe the effectiveness of each initiative at reducing ignition probability or wildfire consequence	Metrics Impacted	Quantitative Evaluation
IN-3	Infrared Inspection of energized overhead distribution facilities and equipment	Inspect approximately 50% of distribution circuits in HFRA	Inspections identify conditions in need of remediation, conditions are prioritized, and items are remediated before they fail and cause a fault. Inspections that lead to remediations help reduce ignition probability factors.	- CPUC reportable ignitions in HFRA - Faults in HFRA - Wire down incidents in HFRA	SCE intends to measure the number of incidences of each of these metrics that Infrared Inspection of Energized OH Distribution Equipment identify and are ultimately remediated to reduce risk ("Distribution OH Infrared Inspections & Remediations") are effective in mitigating in the areas where Distribution OH Infrared Inspections & Remediations have been completed, prior to and after completion of Distribution OH Infrared Inspections & Remediations. See parts (1) and (2) of action statement for evaluation timeline. In addition, Distribution OH Infrared Inspections & Remediations reduce risk across specific sub-drivers that cause ignitions. Based on SCE's risk modeling used in the 2021 WMP Update, SCE estimates the overall mitigation effectiveness of this activity to be approximately 1% against the overall set of ignition-causing risk drivers, assuming deployment across HFRA.
IN-4	Infrared Inspection, Corona Scanning, and High Definition imagery of energized overhead Transmission facilities and equipment	Inspect 1,000 transmission circuit miles on HFRA circuits	Inspections identify conditions in need of remediation (i.e. priority notifications), notifications are prioritized, and notifications are expected to be remediated before they fail and cause a fault/wire down/ignition. Inspections lead to remediations, and these remediations help reduce ignition probability factors.	- CPUC reportable ignitions in HFRA - Faults in HFRA - Wire down incidents in HFRA	SCE intends to measure the number of incidences of each of these metrics that Infrared Inspection, Corona Scanning and HD image capture of energized OH Transmission equipment identify and are ultimately remediated to reduce risk ("Transmission OH Infrared Inspections & Remediations") are effective in mitigating in the areas where Transmission OH Infrared Inspections & Remediations have been completed, prior to and after completion of Transmission OH Infrared Inspections & Remediations. In addition, Transmission OH Infrared Inspections & Remediations reduce risk across specific sub-drivers that cause ignitions. Based on SCE's risk modeling used in the 2021 WMP Update, SCE estimates the overall mitigation effectiveness of this activity to be less than 1% against the overall set of ignition-causing risk drivers, assuming deployment across HFRA.
IN-5	Generation High Fire Risk Informed Inspections in HFRA	Complete inspection of 181 generation-related assets in HFRA	Inspections identify conditions in need of remediation (i.e., priority notifications), notifications are prioritized, and notifications are expected to be remediated before they fail and cause a fault/wire down/ignition. Inspections lead to remediations, and these remediations help reduce ignition probability factors.	- CPUC reportable ignitions in HFRA - Faults in HFRA - Wire down incidents in HFRA	Deterioration of electrify equipment in generation facilities pose the same fault and ignition risks described in the Distribution HFRI Inspection program (IN-1.1). Because SCE's generation facilities are often located in or near heavily forested areas, wildfire propagation in these areas could affect critical power generation infrastructure and equipment. Consistent with our RSE calculations, effectiveness of this activity will be evaluated through to IN-1.1.
IN-8	Inspection Work Management Tools	Transition Aerial and Transmission Ground inspection processes to a single digital platform with at least 75% of inspectors trained to use the tool by year end 2021 Key AI/ML models leveraged by the Aerial inspection process; Deploy scope mapping tool with GIS visualization to Distribution Planning and Engineering users Deploy remediation mobile software and iPad devices for transmission and distribution	The Inspection Work Management Tools are enabling activities to the inspection and remediation activities described in IN-1.1 and IN-1.2.	- These activities serve the purpose of enabling a number of the remaining WMP activities and therefore map indirectly to the outcome-based metrics	Because IN-8 is an enabling activity for IN-1.1 and IN-1.2, the effectiveness is measured by the effectiveness of IN-1.1 and IN-1.2.
VM-1	Hazard Tree Management Program	Assess between 150,000 and 200,000 trees for hazardous conditions and perform prescribed mitigations in accordance with program guidelines and schedules	HTMP will reduce vegetation caused faults from fall-ins and blow-ins and therefore reduce probability of ignition.	- CPUC reportable ignitions in HFRA - Faults in HFRA - Wire down incidents in HFRA	SCE intends to measure the number of incidences of each of these metrics that Hazard Tree Mitigation Program (HTMP) are effective in mitigating in the areas where HTMP have been deployed, prior to and after deployment of HTMP. See parts (1) and (2) of action statement for evaluation timeline. In addition, HTMP reduces risk across specific sub-drivers that cause ignitions. Based on SCE's risk modeling used in the 2021 WMP Update, SCE estimates the overall mitigation effectiveness of this activity to be approximately 8% against the overall set of ignition-causing risk drivers, assuming deployment across HFRA.
VM-2	Expanded Pole Brushing	SCE plans to pole brush between 200,000 and 300,000 Distribution poles	Performing brush clearance prevents fires spreading to and from poles, reducing probability and consequence of ignitions.	- CPUC reportable ignitions in HFRA - Faults in HFRA - Wire down incidents in HFRA	SCE intends to measure the number of incidences of each of these metrics that Hazard Tree Mitigation Program (HTMP) are effective in mitigating in the areas where HTMP have been deployed, prior to and after deployment of HTMP. See parts (1) and (2) of action statement for evaluation timeline. In addition, HTMP reduces risk across specific sub-drivers that cause ignitions. Based on SCE's risk modeling used in the 2021 WMP Update, SCE estimates the overall mitigation effectiveness of this activity to be approximately 8% against the overall set of ignition-causing risk drivers, assuming deployment across HFRA.

Activity #	Initiative / Activity	Projected Target by End of 2021	Describe the effectiveness of each initiative at reducing ignition probability or wildfire consequence	Metrics Impacted	Quantitative Evaluation
VM-3	Expanded Clearances for Legacy Facilities	Treat 46 sites	These assessments and treatments will help ensure SCE maintains vegetation clearance requirements per NERC, ANSI, and CALFIRE ordinances in all identified legacy facilities in HFRA. Reducing vegetation and fuel will reduce probability of ignition and reduce spread in the case of ignition.	- CPUC reportable ignitions in HFRA - Faults in HFRA - Wire down incidents in HFRA	Expanded clearances for Legacy Facilities began in 2020 and SCE was able to treat 46 sites throughout the year. When comparing vegetation-related findings from the inspection activity (IN-5) for 2019 and 2020, SCE saw a decrease of 23% in findings. SCE expects findings to continue to decrease and remain low as we treat additional sites and maintain clearances in accordance with our annual vegetation maintenance plan. The focus of this activity is to reduce fuel, provide a defensible space and slow the spread of fire in the case of a future ignition. In addition, Expanded Clearances reduce risk across specific sub-drivers that cause ignitions. Based on SCE's risk modeling used in the 2021 WMP Update, SCE estimates the overall mitigation effectiveness of this activity to be less than 1% against the overall set of ignition-causing risk drivers.
VM-4	Dead and Dying Tree Removal	Perform Drought Relief Initiative (DRI) annual inspections and perform prescribed mitigations in accordance with program guidelines and schedules	Reducing the probability of dead, dying or diseased trees with compromised integrity falling into lines will reduce vegetation related faults and in turn reduce probability of ignitions.	- CPUC reportable ignitions in HFRA - Faults in HFRA - Wire down incidents in HFRA	SCE intends to measure the number of incidences of each of these metrics that Drought Relief Initiative (DRI) are effective in mitigating in the areas where DRI have been deployed, prior to and after deployment of DRI. See parts (1) and (2) of action statement for evaluation timeline. In addition, DRI reduce risk across specific sub-drivers that cause ignitions. Based on SCE's risk modeling used in the 2021 WMP Update, SCE estimates the overall mitigation effectiveness of this activity to be approximately 7% against the overall set of ignition-causing risk drivers, assuming deployment across HFRA.
VM-6	VM Work Management Tool (Arbora)	Continue Work Management Tool (Arbora) agile development and releases in accordance with project plan – complete full rollout of Dead & Dying Tree Removal and Hazard Tree Mitigation, and conduct discovery and design architecture associated with Line Clearing	Aligns workstreams to improve visibility to high risk areas across VM programs & increases work efficiency through aligning in-flight capital work. Improving work processes and work management can lead to reduced ignitions and faults from vegetation-contact with conductors.	- These activities serve the purpose of enabling a number of the remaining WMP activities and therefore map indirectly to the outcome-based metrics	Because VM-6 is intended to be an enabling activity for all VM activities, its effectiveness is measured through VM activities.
PSPS-2	Customer Care Programs	Community Resource Centers (CRC): Enable up to 15 remote CRCs with a backup transfer switch. Community Resiliency Programs: Resiliency Zones: Targeting to obtain 5 to 10+ additional agreements, pending community leaders identifying potential customer sites. Customer Resiliency Equipment Incentive: Complete installation of microgrid islanding (CREI) capability on second pilot customer. CCBB: Expand the CCBB program to all eligible Medical Baseline customers (CARE/FERA & HFRA) and increase outreach activities to increase enrollment Well Water & Residential Battery Station Rebates: Increase customer participation by 20% - 40%	These activities do not directly reduce ignition probability or wildfire consequence, but are necessary for supporting SCE's customers during PSPS events. CRCs help mitigate the impacts of PSPS events by providing customers with information about SCE's PSPS resiliency programs and incentives, the ability to update contact information and enroll in outage alerts, as well as other amenities such as bottled water and light snacks, ice and ice vouchers, restroom access, and the ability for customers to charge personal devices. During the COVID-19 pandemic, CRC services have been altered to protect public safety further (social distancing, Resiliency kits with PPE). The Resiliency Zones Pilot will equip essential services (gas stations, markets, etc.) in remote zones that participate in the pilot with the electrical equipment for back-up generation, and SCE will deploy back-up power during PSPS events. The Critical Care Backup Battery (CCBB) Program is designed to assist SCE's most vulnerable customers by providing a free portable backup battery to temporarily power medical devices during an outage. By expanding the program to target a larger eligible customer population, SCE will increase back-up batteries deployed to vulnerable customers in HRFA that may not otherwise have the resources to procure necessary resiliency equipment. Well water generator rebates are designed to help mitigate the impact of the de-energization by enabling ongoing access to water that would	- Reduces consequence of PSPS de-energization events	CRCs: The effectiveness of CRCs will be measured by survey assessments taken by customers that visit CRCs during PSPS events. Resiliency Zones: SCE will assess the effectiveness of the Resiliency Zones pilot through post-event utilization learnings, as well as the receptiveness of the program with county and community leaders as evidenced by participation in identifying site locations. CCBB Program: SCE will measure the effectiveness of the CCBB program through customer participation and battery deployment volume, as well as through customer satisfaction surveys post battery deployment. Well Water & Residential Battery Station Rebates: Effectiveness will be measured by total customer rebate redemption against our target of increasing redemption by 20 to 40%.

Activity #	Initiative / Activity	Projected Target by End of 2021	Describe the effectiveness of each initiative at reducing ignition probability or wildfire consequence	Metrics Impacted	Quantitative Evaluation
DG-1	Wildfire Safety Data Mart and Data Management (WiSDM / Ezy)	WiSDM: - Complete the WisDM solution analysis and design phase for centralized data repository - Initiate staggered consolidation of datasets from SCE Enterprise systems Ezy Data: - Implement the cloud platform infrastructure for Ezy Data - Build a solution for data consumption, storage and visualization of inspection data (LiDAR, HD video, photograph) - Enable an environment for Artificial Intelligence (AI) assisted analytics	Improves accessibility of wildfire data across all WMP activities (inspection, mitigation, system hardening, vegetation management and PSPS efforts) and improves efficiency of reporting, among many other benefits.	- These activities serve the purpose of enabling a number of the remaining WMP activities and therefore map indirectly to the outcome-based metrics	DG-1 is an enabling activity for data management, improved reporting and data sharing of other WMP activities, and its effectiveness is measured through other WMP activities in these areas.
DEP-1.2	Customer Education and Engagement - Community Meetings	Host at least nine virtual community meetings SCE will complete additional meetings as needed in 2021, based on PSPS impact to communities, up to 18	This activity is not intended to directly reduce ignition probability or wildfire consequence; however, it can help customers and communities be better prepared thus reducing the impacts of wildfire and PSPS events. Collaboration with the communities can also facilitate timely completion of wildfire mitigation work which would reduce wildfire risks in turn.	- These activities serve the purpose of enabling a number of the remaining WMP activities and therefore map indirectly to the outcome-based metrics	While the community meetings do not reduce ignition probably or wildfire consequences, they help external stakeholders and customers better understand and be prepared for SCE's wildfire mitigation activities, including PSPS, as well as the customer programs and resources available to support them. The effectiveness of DEP-1.2 will be determined through DEP-4, as described in the entry for DEP-4.
DEP-1.3	Customer Education and Engagement - Marketing Campaign	PSPS Customer Awareness goal: 50%	While not intended to reduce ignition probability or wildfire consequence, the marketing campaign seeks to educate customers about PSPS and emergency preparedness and reduce impact of a PSPS or wildfire event through customers' preparedness.	- PSPS Customer Awareness goal	Effectiveness of the marketing campaign is measured by the PSPS customer awareness goal. The threshold to determine whether SCE is effective in its outreach is set to 50%, a higher percentage would indicate SCE's outreach is meeting the objective of the marketing campaign. SCE is continuing to refine its methodology for measuring the effectiveness of this activity. This is an enabling activity, and does not directly impact the five effectiveness metrics nor reduces wildfire risk. The effectiveness of DEP-1.3 will be determined through DEP-4, as described in the entry for DEP-4.
DEP-2	SCE Emergency Responder Training	IMT – Have all PSPS IMT and Task Force members fully trained and qualified or requalified by July 1, 2021 UAS – In 2021 SCE plans to expand the program by an additional 50 operators over 2020 levels	IMT - A trained and qualified incident management team is more effective in PSPS operations, thus mitigating the risk of wildfires along with frequency and scope of PSPS. Additionally, a well-trained team provides greater consistency and precision across each PSPS event. UAS - SCE develops technical training programs to train qualified personnel in the use of unmanned aircraft to perform activities such as pre-patrol inspections which can provide quicker and greater precision in identifying potential hazard on system equipment in areas that can be difficult to accurately detected from ground, thus reducing the risk of ignitions, faults and wire-downs. Additionally, this training program ensures qualified personnel can operate unmanned aircraft safely for post-patrol inspections during PSPS events, as circuits must patrolled to identify potential hazards before energization, which can reduce the overall PSPS durations and number of customer impacted.	IMT and UAS - These activity serve the purpose of enabling a number of the remaining WMP activities and therefore maps indirectly to all outcome-based metrics	IMT - While this is an enabling activity, SCE will continue to evaluate whether there is a direct correlation to PSPS average duration and accuracy of PSPS notification metrics. SCE aims to have 100% passing rate for trainings of all PSPS IMT and Task Force members who will be fully trained and qualified by July, 2021; with an additional 50 operators over 2020 levels who will be included in the program in 2021. Additionally, SCE will continue to explore the effectiveness of this activity and potentially leverage the datapoints included in after-action reports (populated post PSPS event) to measure the improvements made over time related to corrective actions and lessons learned which may have an impact on increasing accuracy and timeliness of PSPS notifications. UAS - By certifying additional resources to be able to operate drones, SCE is positioned to mitigate wire down, ignitions and faults through pre-patrol inspections by identifying anomalies more quickly (e.g., broken cross-arms, malfunctioning equipment, trees touching or falling into lines). For post-patrol inspections, drones can be utilized to evaluate the field conditions faster and perform inspections prior to re-energizing the circuits during the PSPS events. This may be especially beneficial for areas that are difficult to access. By utilizing drones in post-patrol, this may increase the efficiency and reduce the outage durations during PSPS events.
DEP-4	Customer Research and Education	Administer at least 4 PSPS-related surveys (PSPS Tracker Survey to capture feedback on the 2020 events, wildfire community meeting feedback survey, CRC/CCV feedback survey, In-Language Wildfire Mitigation Communications Effectiveness Pre/Post Survey)	This initiative is not intended to reduce ignition probability or wildfire consequence, but information from customer surveys will measure how effective we are at educating customers of WMP initiatives and communicating with them about PSPS events, where we can help improve customer communication channels, materials, and other resources, thus helping customers' preparedness for wildfires and PSPS events.	- These activities serve the purpose of enabling a number of the remaining WMP activities and therefore map indirectly to the outcome-based metrics	Surveying stakeholders is a support function to collect customer insights and serves as a feedback mechanism for other WMP activities (DEP-1.2, DEP-1.3, PSPS-2) to improve their effectiveness. For the PSPS Tracker survey, SCE aims to receive completed survey responses from at least 500 customers in each of the 4 sample groups targeted in the Residential survey, and aims to receive completed survey responses from at least 100 customers in each of the 4 sample groups targeted in the business customer survey. For community meetings and CRC/CCV deployment feedback surveys, there is not a target response rate as it is entirely based on a customer's choice to respond to the survey request. For the In-Language Wildfire Mitigation Communications Effectiveness Pre/Post Survey, there are separate surveys for residential customers and business customers. For the residential survey, SCE aims to receive completed survey responses from a minimum of 2,000 Residential customers per survey wave. For the Business customer survey, SCE aims to receive completed survey responses from a minimum of 400 Business customers in each survey.

GUIDANCE 5 ACTION STATEMENT SCE-5
Table G5-SCE5-1

Activity #	Initiative / Activity	Projected Target by End of 2021	Describe the effectiveness of each initiative at reducing ignition probability or wildfire consequence	Metrics Impacted	Quantitative Evaluation
DEP-5	Aerial Suppression	Enter a Memorandum of Understanding (MOU) with CAL FIRE and local county fire departments to provide standby cost funding for up to 5 aerial suppression resources strategically placed around the SCE service area	While aerial suppression resources will not be able to stop a fire at the onset, they can be used to reduce the area and assets burned and enable faster response times. In addition, aerial suppression resources help lower emergency response support costs and help minimize the impact of redirecting work crews from previously scheduled maintenance and construction work to emergency response.	- These activities serve the purpose of enabling a number of the remaining WMP activities and therefore map indirectly to the outcome-based metrics	Based upon SCE's preliminary risk modeling results, SCE expects that aerial suppression activities are able to reduce the expected consequence of ignitions that materialize into large wildfires. Aerial suppression is estimated to reduce the consequence risk of ignitions. See parts (1) and (2) of action statement for evaluation timeline.

Attachment C: SCE 2020 WMP Cost Variance Explanation

SCE 2020 WMP Cost Variance Explanation (Nominal $ in thousands)

Note: *SCE has focused on describing variance drivers for initiatives where actual spend exceeded +/- 20% of forecast costs and, where this threshold was triggered, for variances greater than or less than $1M.*

Mitigation	2020 WMP - Initiative Activity	WMP Identifier	2020 Forecast CAPEX	2020 Forecast OPEX	2020 Actuals CAPEX	2020 Actuals OPEX	CAPEX $ Variance Overrun/ (Underrun)	CAPEX % Variance Overrun/ (Underrun)	OPEX $ Variance Overrun/ (Underrun)	OPEX % Variance Overrun/ (Underrun)	Variance Drivers (+/- 20% and greater than +/- $1M delta)
Asset management and inspections	9.2.1. Other discretionary inspection of distribution electric lines and equipment, beyond inspections mandated by rules and regulations: unmanned aerial vehicles (UAV) (AT-2.2)	AT-2.2	$ -	$ 413	$ -	$ 159	$ -	0%	$ (254)	-62%	
Asset management and inspections	9.1.1. Other discretionary inspection of distribution electric lines and equipment, beyond inspections mandated by rules and regulations: asset defect detection using machine learning object detection (AT-5)	AT-5	$ -	$ -	$ -	$ -	$ -	0%	$ -	0%	
Asset management and inspections	10.2.1. Other discretionary inspection of transmission electric lines and equipment, beyond inspections mandated by rules and regulations: assessment of partial discharge for transmission facilities (AT-6)	AT-6	$ -	$ -	$ -	$ -	$ -	0%	$ -	0%	
Asset management and inspections	9.1. Other discretionary inspection of distribution electric lines and equipment, beyond inspections mandated by rules and regulations: distribution high fire risk-informed inspections (IN-1.1)	IN-1.1	$ -	$ 2,276		$ 11,013	$ -	0%	$ 8,737	384%	O&M Overrun: SCE conducted additional ground inspections to align with aerial and provide a 360 degree view of each structure as noted in September 11, 2020 Change Orders Report, and increased scope for data capturing on risk-informed inspections and ODI compliance inspections. SCE also conducted additional inspections of high-risk dry-fuel areas (Areas of Concern) as noted in December 11, 2020 Change Orders Report. In the 2020 WMP, SCE planned to inspect ~105k structures. By the end of 2020, SCE completed ~199k structures.
Asset management and inspections	10.1. Other discretionary inspection of transmission electric lines and equipment, beyond inspections mandated by rules and regulations: transmission risk-informed inspections in HFRA (IN-1.2)	IN-1.2	$ -	$ 1,150		$ 4,946	$ -	0%	$ 3,796	330%	O&M Overrun: SCE conducted additional ground inspections to align with aerial and provide a 360 degree view of each structure as noted in its September 11, 2020 Change Orders Report and also conducted additional inspections of high-risk dry-fuel areas (Areas of Concern) as noted in its December 11, 2020 Change Orders Report. In the 2020 WMP, SCE planned to inspect ~22,500 structures. By the end of 2020, SCE completed ~35,500 structures.
Asset management and inspections	4. Infrared inspections of distribution electric lines and equipment: infrared inspection of energized overhead distribution facilities and equipment (IN-3)	IN-3	$ -	$ 401	$ -	$ 791	$ -	0%	$ 390	97%	

Mitigation	2020 WMP - Initiative Activity	WMP Identifier	2020 Forecast CAPEX	2020 Forecast OPEX	2020 Actuals CAPEX	2020 Actuals OPEX	CAPEX $ Variance Overrun/ (Underrun)	CAPEX % Variance Overrun/ (Underrun)	OPEX $ Variance Overrun/ (Underrun)	OPEX % Variance Overrun/ (Underrun)	Variance Drivers (+/- 20% and greater than +/- $1M delta)
Asset management and inspections	5. Infrared inspections of transmission electric lines and equipment: infrared inspection, corona scanning, and high definition imagery of energized overhead transmission facilities and equipment (IN-4)	IN-4	$ -	$ 3,504	$ -	$ 384	$ -	0%	$ (3,120)	-89%	The original forecast was an error. Recorded costs were in line with expected costs for this type of work.
Asset management and inspections	16. Other discretionary inspection of distribution electric lines and equipment, beyond inspections mandated by rules and regulations: generation risk-informed inspections in HFRA (IN-5)	IN-5	$ -	$ 158	$ -	$ -	$ -	0%	$ (158)	-100%	
Asset management and inspections	9.2. Other discretionary inspection of distribution electric lines and equipment, beyond inspections mandated by rules and regulations: aerial inspections (IN-6.1)	IN-6.1	$ -	$ 40,059		$ 53,287	$ -	0%	$ 13,228	33%	O&M Overrun: Aerial Inspections overrun due to increased division overhead not previously forecast. Forecast only included direct costs from 3rd party vendors for helicopters, drone flights, and inspector costs, but did not include associated indirect/loader costs.
Asset management and inspections	10.2. Other discretionary inspection of transmission electric lines and equipment, beyond inspections mandated by rules and regulations: aerial inspections - transmission (IN-6.2)	IN-6.2	$ -	$ 11,869	$ -	$ 28,136	$ -	0%	$ 16,267	137%	O&M Overrun: Transmission Aerial Inspections cost increase due to 1) transition in strategy from using helicopters to more expensive unmanned aerial drones for improved image capture quality and 2) increased division overhead not in previous forecast. The transition in strategy to using more drones was due to SCE's helicopter vendor having difficulty providing deliverables that met the SCE technical requirements as well as incidents that jeopardized the safety of the awarded scope. SCE decided to reroute majority of the scope to Drone Vendors because they had the capacity and could provide deliverables that met SCE's technical requirements.
Asset management and inspections	9.2.2. Other discretionary inspection of distribution electric lines and equipment, beyond inspections mandated by rules and regulations: UAS operations training (OP-3)	OP-3	$ -	$ 271	$ -	$ -	$ -	0%	$ (271)	-100%	
Emergency planning and preparedness	2. Community outreach, public awareness, and communications efforts(DEP-1.1 - DEP-1.3, DEP-3)	DEP-1.1; DEP-1.3; DEP-3	$ -	$ 9,110	$ -	$ 1,797	$ -	0%	$ (7,313)	-80%	O&M Underrun: In 2019, SCE participated in the statewide PSPS marketing campaign in collaboration with the other IOUs. As discussed in September 11, 2020 Change Order Report, the statewide outreach captured in IOU Customer Engagement (DEP-3) ended and the funds were redeployed to SCE's local marketing campaign (DEP 1.3). Starting in 2020, SCE launched its own marketing campaign while continuing to work closely with the other IOUs for benchmarking purposes. PSPS Newsletter forecast underrun driven by ~11% lower quantity of customer letters printed and unit costs ~50% lower than planned.
Emergency planning and preparedness	1. Adequate and trained workforce for service restoration (DEP-2)	DEP-2	$ -	$ 1,722	$ -	$ 616	$ -	0%	$ (1,106)	-64%	O&M Underrun: Several trainings were pushed out from 2020 to 2021 primarily due to COVID-19 restrictions.
Emergency planning and preparedness	7. Customer research and education (DEP-4)	DEP-4	$ -	$ 1,409	$ -	$ -	$ -	0%	$ (1,409)	-100%	Costs recorded in DEP-1.1, DEP-1.3. DEP-3. See explanation above.

Mitigation	2020 WMP - Initiative Activity	WMP Identifier	2020 Forecast CAPEX	2020 Forecast OPEX	2020 Actuals CAPEX	2020 Actuals OPEX	CAPEX $ Variance Overrun/ (Underrun)	CAPEX % Variance Overrun/ (Underrun)	OPEX $ Variance Overrun/ (Underrun)	OPEX % Variance Overrun/ (Underrun)	Variance Drivers (+/- 20% and greater than +/- $1M delta)
Grid design and system hardening	2.2. Circuit breaker maintenance and installation to de-energize lines upon detecting a fault: alternative technology evaluations - meter alarm down energized conductor (MADEC) (AT-1)	AT-1	$ -	$ -	$ -	$ -	$ -	0%	$ -	0%	
Grid design and system hardening	2.3.1. Circuit breaker maintenance and installation to de-energize lines upon detecting a fault: alternative technology evaluations - rapid earth current fault limiter - ground fault neutralizer (GFN) (AT-3.1)	AT-3.1	$ -	$ 2,587	$ 1,855	$ -	$ 1,855	-	$ (2,587)	-100%	Forecast was originally identified as O&M in 2020 WMP filing but determined to be Capital through Capital Asset Versus Expense (CAVE) analysis
Grid design and system hardening	2.3.2. Circuit breaker maintenance and installation to de-energize lines upon detecting a fault: alternative technology evaluations - rapid earth current fault limiter - arc suppression coil (AT-3.2)	AT-3.2	$ -	$ 511	$ -	$ -	$ -	0%	$ (511)	-100%	
Grid design and system hardening	2.3.3. Circuit breaker maintenance and installation to de-energize lines upon detecting a fault: alternative technology evaluations - rapid earth current fault limiter - isolation transformer (AT-3.3)	AT-3.3	$ -	$ 409	$ -	$ -	$ -	0%	$ (409)	-100%	
Grid design and system hardening	2.4. Circuit breaker maintenance and installation to de-energize lines upon detecting a fault: alternative technology evaluations - distribution open phase detection (AT-3.4)	AT-3.4	$ -	$ 511	$ -	$ -	$ -	0%	$ (511)	-100%	
Grid design and system hardening	3.3. Covered conductor installation: alternative technology implementation - vibration dampers (AT-4)	AT-4	$ -	$ -	$ -	$ -	$ -	0%	$ -	0%	
Grid design and system hardening	2.5. Circuit breaker maintenance and installation to de-energize lines upon detecting a fault: alternative technology evaluations - high impedance relay evaluations (AT-8)	AT-8	$ -	$ 307	$ -	$ -	$ -	0%	$ (307)	-100%	
Grid design and system hardening	8.2. Grid topology improvements to mitigate or reduce PSPS events: microgrid assessment (PSPS-8)	PSPS-8	$ -	$ -	$ -	$ -	$ -	0%	$ -	0%	

Mitigation	2020 WMP - Initiative Activity	WMP Identifier	2020 Forecast CAPEX	2020 Forecast OPEX	2020 Actuals CAPEX	2020 Actuals OPEX	CAPEX $ Variance Overrun/ (Underrun)	CAPEX % Variance Overrun/ (Underrun)	OPEX $ Variance Overrun/ (Underrun)	OPEX % Variance Overrun/ (Underrun)	Variance Drivers (+/- 20% and greater than +/- $1M delta)
Grid design and system hardening	3.1. Covered conductor installation: covered conductor (SH-1)	SH-1	$ 454,369	$ -	$ 546,151	$ -	*$ 91,783*	*20%*	*$ -*	*0%*	*Capital Overrun: Major Drivers of cost variance: 1) Includes Fire Resistant (FR) poles recorded costs whereas the 2020 WMP did not include Fire Resistant (FR) poles under SH-1. FR poles were in SH-3, 2020 equaled $56.8M. 2) Design and engineering of future year scope was started to enable increasing targets over time 3) Previous unit costs based on a composite of all regions*
Grid design and system hardening	3.2. Covered conductor installation: tree attachment remediation (SH-10)	SH-10	$ 15,183	$ -	$ 9,654	$ -	*$ (5,529)*	*-36%*	*$ -*	*0%*	*Capital Underrun: Underrun on tree attachment remediations were driven by halt in construction activities in September 2020 due to the Sequoia and Creek fires.*
Grid design and system hardening	19. Legacy facilities (SH-11)	SH-11	$ 1,304	$ 869	$ -	$ 74	*$ (1,304)*	*-100%*	*$ (796)*	*-92%*	*Capital and O&M Underrun: The primary underrun was due to the Creek Fire, which delayed SCE's ability to do assessments and pre-engineering studies for the Big Creek Hydro facilities originally planned. SCE also found a very low risk for avian wildlife protections for legacy facilities, which resulted in reduced incremental work to involving reduced ignition risks.*
Grid design and system hardening	12.1. Other corrective action: distribution remediations (SH-12.1)	SH-12.1	$ 147,130	$ 180,405	$ 85,219	$ 41,807	*$ (61,911)*	*-42%*	*$ (138,599)*	*-77%*	*Capital and O&M Underrun: Reduced inspection find rates from Aerial and Ground inspections resulted in less scope to be remediated. Operational challenges such as COVID-19 restrictions, fire storms, and PSPS events led to a reduction in the total number of compliance-driven notifications completed within the year.*
Grid design and system hardening	12.2. Other corrective action: transmission remediations(SH-12.2)	SH-12.2	$ 64,896	$ 6,424	$ 35,934	$ 18,739	*$ (28,962)*	*-45%*	*$ 12,315*	*192%*	*O&M Overrun: Transmission EOI Inspections- SCE conducted additional ground inspections to align with aerial and provide a 360 degree view of each structure as noted in its September 11, 2020 Change Orders Report and also conducted additional inspections of high-risk dry-fuel areas (Areas of Concern) as noted in its December 11, 2020 Change Orders Report. As noted in EOI Inspections - T, SCE conducted additional inspections and thus saw higher remediations, but also saw a higher find rate than forecasted. Also, scope originally forecast to be capital turned out to be O&M Aerial Remediations forecasted individually in 2020 WMP. In 2021 WMP, costs for Aerial remediations not tracked separately, actuals included under EOI Repairs/Replacements combined with Ground due to process for execution and contractor billing being combined during invoicing. Capital Underrun: Transmission EOI Replacement scope originally forecast to be capital turned out to be O&M. Underrun also driven by lower capital find rate compared to previously assumed in 2020 WMP filing which was based off 2018 & 2019 remediations. Aerial Remediations forecasted individually in 2020 WMP. In 2021 WMP, costs for Aerial remediations not tracked separately, actuals included under EOI Repairs/Replacements combined with Ground due to process for execution and contractor billing being combined during invoicing.*
Grid design and system hardening	12.3. Other corrective action: generation remediations (SH-12.3)	SH-12.3	$ 40	$ 160	$ -	$ 403	*$ (40)*	*-100%*	*$ 243*	*152%*	

Mitigation	2020 WMP - Initiative Activity	WMP Identifier	2020 Forecast CAPEX	2020 Forecast OPEX	2020 Actuals CAPEX	2020 Actuals OPEX	CAPEX $ Variance Overrun/ (Underrun)	CAPEX % Variance Overrun/ (Underrun)	OPEX $ Variance Overrun/ (Underrun)	OPEX % Variance Overrun/ (Underrun)	Variance Drivers (+/- 20% and greater than +/- $1M delta)
Grid design and system hardening	16. Undergrounding of electric lines and/or equipment: undergrounding overhead conductor (SH-2)	SH-2	$ -	$ -	$ 961	$ -	*$ 961*	*0%*	*$ -*	*0%*	
Grid design and system hardening	6.1. Distribution pole replacement and reinforcement, including with composite poles: composite poles and crossarms (SH-3)	SH-3	$ 56,833	$ -	$ -	$ -	*$ (56,833)*	*-100%*	*$ -*	*0%*	*2020 WMP filing did not include Fire Resistant (FR) poles Under SH-1. FR poles was in SH-3, 2020 equaled $56.8M)*
Grid design and system hardening	7. Expulsion fuse replacement: branch line protection strategy (SH-4)	SH-4	$ 9,054	$ 7,745	$ 8,955	$ 3,262	*$ (98)*	*-1%*	*$ (4,483)*	*-58%*	*O&M Underrun: Current Limiting Fuses O&M forecast underrun due to new fixed price contractor rates and lower maintenance units executed. Each year will have its own scope based on GRC, primarily replacements, and Unit Rate should be $4,100 per location replacement as originally estimated.*
Grid design and system hardening	9. Installation of system automation equipment: installation of system automation equipment - remote controlled automatic reclosers settings update (SH-5)	SH-5	$ 8,481	$ 159	$ 5,867	$ -	*$ (2,614)*	*-31%*	*$ (159)*	*-100%*	*Capital Underrun: RAR/RCS slightly underran by 33% due to lower units completed than planned (48 vs. 96). The "Program Target" of 45 was the minimum number of units SCE set out to complete in 2020.*
Grid design and system hardening	2.7. Circuit breaker maintenance and installation to de-energize lines upon detecting a fault: circuit breaker relay hardware for fast curve (SH-6)	SH-6	$ 5,170	$ -	$ 9,786	$ (9)	*$ 4,616*	*89%*	*$ (9)*	*0%*	*Capital Overrun: Unit count increased as scope moved from 2019-20 to 2021-22 due to revised project planning timelines.*
Grid design and system hardening	8.1. Grid topology improvements to mitigate or reduce PSPS events: PSPS driven grid hardening work (SH-7)	SH-7	$ -	$ -	$ -	$ -	*$ -*	*0%*	*$ -*	*0%*	
Grid design and system hardening	18. Transmission overhead (TOH) review (SH-9)	SH-9	$ -	$ -	$ -	$ -	*$ -*	*0%*	*$ -*	*0%*	
Grid operations and protocols	1.1. Annual SOB 322 review (OP-1)	OP-1	$ -	$ -	$ -	$ -	*$ -*	*0%*	*$ -*	*0%*	
Grid operations and protocols	5.7. PSPS events and mitigation of PSPS impacts: wildfire infrastructure protection team additional staffing (OP-2)	OP-2	$ -	$ 1,817	$ -	$ 810	*$ -*	*0%*	*$ (1,007)*	*-55%*	*O&M Underrun: Due to a delay in hiring FTEs to support this activity.*
Grid operations and protocols	7. De-energization notifications (PSPS-1)	PSPS-1	$ -	$ 1,415	$ -	$ 2,690	*$ -*	*0%*	*$ 1,274*	*90%*	*O&M Overrun: Emergency Outage Notification System (EONS) overrun due to incremental notification billable units exceeding base subscription rates and system dashboard enhancements to track enrollments.*
Grid operations and protocols	5.1. PSPS events and mitigation of PSPS impacts: community resource centers (PSPS-2)	PSPS-2	$ 1,212	$ 1,063	$ -	$ 952	*$ (1,212)*	*-100%*	*$ (110)*	*-10%*	*Original forecasts including assumptions for capital and O&M. Recorded costs were all O&M and were less than total capital & O&M forecasts based on the assumptions on the number of times SCE would use those facilities.*
Grid operations and protocols	5.2. PSPS events and mitigation of PSPS impacts: customer resiliency equipment incentives (PSPS-3)	PSPS-3	$ -	$ -	$ -	$ 143	*$ -*	*0%*	*$ 143*	*0%*	

Mitigation	2020 WMP - Initiative Activity	WMP Identifier	2020 Forecast CAPEX	2020 Forecast OPEX	2020 Actuals CAPEX	2020 Actuals OPEX	CAPEX $ Variance Overrun/ (Underrun)	CAPEX % Variance Overrun/ (Underrun)	OPEX $ Variance Overrun/ (Underrun)	OPEX % Variance Overrun/ (Underrun)	Variance Drivers (+/- 20% and greater than +/- $1M delta)
Grid operations and protocols	5.3. PSPS events and mitigation of PSPS impacts: income qualified critical care (IQCC) customer battery backup incentive program (PSPS-4)	PSPS-4	$ -	$ 9,241	$ -	$ 4,589	$ -	0%	$ (4,652)	-50%	*O&M underrun: Critical Care Back-up Battery Program underrun due to lower customer enrollment than planned. The program launched later in the year in July 2020 due to initial inventory shortages (likely due to COVID-19) compounded by a longer lead time for customer uptake as SCE limited its marketing channels, also due to COVID-19. This year, SCE started in January and has expanded eligibility to a larger customer set.*
Grid operations and protocols	5.4. PSPS events and mitigation of PSPS impacts: MICOP partnership (PSPS-5)	PSPS-5	$ -	$ -	$ -	$ -	$ -	0%	$ -	0%	
Grid operations and protocols	5.5. PSPS events and mitigation of PSPS impacts: independent living centers partnership(PSPS-6)	PSPS-6	$ -	$ -	$ -	$ -	$ -	0%	$ -	0%	
Grid operations and protocols	5.6. PSPS events and mitigation of PSPS impacts: community outreach (PSPS-7)	PSPS-7	$ -	$ 440	$ -	$ -	$ -	0%	$ (440)	-100%	
Situational awareness and forecasting	2.1. Continuous monitoring sensors: Distribution Fault Anticipation (DFA) (AT-2.1)	AT-2.1	$ -	$ 252	$ 260	$ 215	$ 260	0%	$ (36)	-14%	
Situational awareness and forecasting	2.2. Continuous monitoring sensors: Early Fault Detection (EFD) evaluation (AT-7)	AT-7	$ -	$ 511	$ -	$ -	$ -	0%	$ (511)	-100%	
Situational awareness and forecasting	1. Advanced weather monitoring and weather stations (SA-1)	SA-1	$ 5,536	$ 1,297	$ 7,509	$ 2,073	$ 1,973	36%	$ 777	60%	*Capital and O&M Overrun: Weather Stations overrun driven by the increased units of weather stations installed from 375 to 575 as a stretch goal to achieve a higher level of saturation of weather sensors to obtain high resolution weather data across SCE's HFRA.*
Situational awareness and forecasting	6. Weather forecasting and estimating impacts on electric lines and equipment (SA-3)	SA-3	$ 800	$ 1,657	$ 2,300	$ 1,658	$ 1,500	188%	$ 1	0%	*Capital Overrun: Advanced Modeling overrun due to 1) IT budget/costs transferred to Business Resiliency under activity Wildfire Advanced Modeling and Computer Hardware to align costs related to appropriate work activity of capital investments and 2) additional costs incurred due to delayed vendor projects schedules, initially planned in 2019 and deferred to 2020.*
Situational awareness and forecasting	7. Develop Asset & Reliability & Risk Analytics Capability (RA-1, SA-4)	SA-4:RA-1	$ 6,692	$ -	$ 1,806		$ (4,886)	-73%	$ -	0%	*Capital Underrun: Program budget/costs transferred to Wildfire Advance Modeling and Computer hardware to acquire 1 additional super computer. 2020 forecast was conceptual because the vendors and solution were not finalized at the time of the 2020 WMP filing.*
Situational awareness and forecasting	4.2. Forecast of a fire risk index, fire potential index, or similar: fuel sampling program (SA-5)	SA-5	$ -	$ 632	$ -	$ 193	$ -	0%	$ (439)	-69%	
Situational awareness and forecasting	4.3. Forecast of a fire risk index, fire potential index, or similar: surface & canopy fuels mapping (SA-6)	SA-6	$ -	$ 1,381	$ -	$ 1,029	$ -	0%	$ (352)	-25%	

Mitigation	2020 WMP - Initiative Activity	WMP Identifier	2020 Forecast CAPEX	2020 Forecast OPEX	2020 Actuals CAPEX	2020 Actuals OPEX	CAPEX $ Variance Overrun/ (Underrun)	CAPEX % Variance Overrun/ (Underrun)	OPEX $ Variance Overrun/ (Underrun)	OPEX % Variance Overrun/ (Underrun)	Variance Drivers (+/- 20% and greater than +/- $1M delta)
Situational awareness and forecasting	4.4. Forecast of a fire risk index, fire potential index, or similar: remote sensing / satellite fuel moisture (SA-7)	SA-7	$ -	$ 1,534	$ -	$ -	$ -	0%	$ (1,534)	-100%	*O&M Underrun: Scope is still being finalized and SCE plans to onboard the vendors and execute the projects in 2021 and future years.*
Situational awareness and forecasting	4.5. Forecast of a fire risk index, fire potential index, or similar: fire science enhancements (SA-8)	SA-8	$ -	$ 1,534	$ -	$ 414	$ -	0%	$ (1,120)	-73%	*O&M Underrun: Fire Science Enhancements underrun driven by internal reprioritization of work to focus on higher priority projects.*
Situational awareness and forecasting	2.3. Continuous monitoring sensors: transmission open phase detection (SH-8)	SH-8	$ -	$ 295	$ -	$ 125	$ -	0%	$ (170)	-58%	
Vegetation management and inspections	16.1. Removal and remediation of trees with strike potential to electric lines and equipment: hazard tree (VM-1)	VM-1	$ -	$ 54,097	$ -	$ 46,685	$ -	0%	$ (7,413)	-14%	*O&M Underrun: Hazard Tree Mitigation: Volume lower than forecast - arborist expertise favors removal over trimming mitigation due to risk of trees dying from the amount of trimming required to mitigate risk. Hazard Tree Program Management: Forecast associated with number of mitigations/removals. Forecast underrun due to scope reductions as a result of lower number of mitigations identified. Hazard Tree Removal: SB 247 rate increases impacted contractor pricing. Reduced volume of removals from forecast. Hazard Tree Inspection: 2020 Actuals driven by increase in contractor assessments.*
Vegetation management and inspections	5.1. Fuel management and reduction of "slash" from vegetation management activities: expanded pole brushing (VM-2)	VM-2	$ -	$ 4,157	$ -	$ 7,459	$ -	0%	$ 3,302	79%	*O&M Overrun: Expanded Pole Brushing & Removal: In 2020 WMP, SCE forecasted 300K (compliance target 200k) units to be completed at a unit cost of $14. 2020 actuals reflect completion of ~230K poles minus 75k compliance poles. The unit costs recorded higher in 2020; therefore, SCE adjusted the 2021 and 2022 forecast based on the revised unit costs of $44. Increase due to higher average costs from the addition of two new vendors necessary to complete scope (competitive bid).*
Vegetation management and inspections	5.2. Fuel management and reduction of "slash" from vegetation management activities: expanded clearances for legacy facilities (VM-3)	VM-3	$ -	$ 1,217	$ -	$ -	$ -	0%	$ (1,217)	-100%	*O&M Underrun: Generation Expanded Vegetation Buffers: 2020 recorded of $881K included in Vegetation Line Clearing initiative (7.3.5.20) actuals for reporting purposes.*
Emergency planning and preparedness	5. Preparedness and planning for service restoration	N/A	$ -	$ 11,231	$ 1,796	$ 5,328	$ 1,796	0%	$ (5,903)	-53%	*Capital Overrun: Data Governance overrun due to emergent technology tool programs initiated post 2020 WMP filing.* *O&M Underrun: Line Patrols underrun driven by 1) lower incurred PSPS inspections and incidents than planned (based on 2019 estimates), and 2) percentage of activities and related costs combined and charged to CEMA storms accounts.*
Grid operations and protocols	1. Automatic recloser operations	N/A	$ -	$ -	$ -	$ -	$ -	0%	$ -	0%	
Grid operations and protocols	5. PSPS events and mitigation of PSPS impacts	N/A	$ 788	$ 6,471	$ 6,843	$ 13,528	$ 6,055	769%	$ 7,057	109%	*Capital and O&M overrun: Driven by the addition of customer programs such as outreach, rebates and incentives. Also driven by an overrun in PSPS Website Improvements due to incremental SCE.com scope and accelerated implementation schedules to meet CPUC compliance mandates (R.18-12-005) for compliance and reliability requirements.*
Resource allocation methodology	4. Organizational Support - PMO, OCM, and wildfire-related IT support	N/A	$ 32,117	$ 46,402	$ 28,719	$ 47,081	$ (3,399)	-11%	$ 680	1%	

Mitigation	2020 WMP - Initiative Activity	WMP Identifier	2020 Forecast CAPEX	2020 Forecast OPEX	2020 Actuals CAPEX	2020 Actuals OPEX	CAPEX $ Variance Overrun/ (Underrun)	CAPEX % Variance Overrun/ (Underrun)	OPEX $ Variance Overrun/ (Underrun)	OPEX % Variance Overrun/ (Underrun)	Variance Drivers (+/- 20% and greater than +/- $1M delta)
Situational awareness and forecasting	5. Personnel monitoring areas of electric lines and equipment in elevated fire risk conditions	N/A	$ 220	$ 1,624	$ 94	$ 2,235	*$ (126)*	*-57%*	*$ 611*	*38%*	
Vegetation management and inspections	20. Vegetation management to achieve clearances around electric lines and equipment	N/A	$ -	$ 76,281	$ -	$ 233,585	*$ -*	*0%*	*$ 157,303*	*206%*	*O&M Overrun: Line Clearing cost increase of $157M due to several items as listed below:* *- 2020 WMP did not reflect impact of SB 247, which went into effect on January 1, 2020. SB 247 effectively set higher rates for tree trimmers working on vegetation clearance near power lines for wildfire mitigation and impacts all vegetation management contracts, which needed to be adjusted to reflect the higher rates for the entire crew – from supervisors to safety coordinators totaling ~$83M.* *- System wide trims $12M not included in 2020 forecast.* *- Distribution removals $17M not included in 2020 forecast* *- 2019 backlog of 35k trims primarily in district 50 driven by weather conditions $12M not included in 2020 forecast* *- Increase in Distribution and Transmission HFRA trims, removals, and maintenance $1M* *- Supplemental patrols $5M not included 2020 forecast* *- Environmental, property owner incentives, IVMP, Non-Exempt pole, bark beetle $16M not included in 2020 forecast* *- Costs associated with SCE labor $4M was not included in 2020 forecast. Increasing SCE personnel to enhance planning, reporting, and contractor management to adequately address continued volume and complexity of Line Clearance.* *- Costs associated with emergent work $8M such as district maintenance or trouble tickets was not included in 2020 forecast* *Note: Recorded costs system-wide are difficult to categorize into HFRA and non-HFRA as work is assigned, scheduled and performed in a bundled manner for efficiencies. Crews do not charge their time separately for HFRA and non-HFRA line clearances.*
Vegetation management and inspections	8. LiDAR inspections of vegetation around transmission electric lines and equipment	NA	$ -	$ 1,467	$ -	$ 4,092	*$ -*	*0%*	*$ 2,625*	*179%*	*O&M Overrun: LiDAR increase driven by Distribution and Transmission remediations and minor 2019 carry over.*