BEFORE THE OFFICE OF ENERGY INFRASTRUCTURE SAFETY

OEIS Docket: 2021 Wildfire Mitigation Plan Annual Report on Compliance	Docket #2021-EC_ARC

LIBERTY UTILITIES (CALPECO ELECTRIC) LLC'S (U 933-E) 2021 WILDFIRE MITIGATION PLAN ANNUAL REPORT ON COMPLIANCE

Jordan Parrillo
Manager of Regulatory Affairs
Liberty Utilities (CalPeco Electric) LLC
701 National Ave,
Tahoe Vista, CA 96148
Telephone: 530-721-7818
jordan.parrillo@libertyutilities.com

April 4, 2022

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Pursuant to Cal. Pub. Util. Code § 8386 and the Office of Energy Infrastructure Safety ("OEIS") Resolution M-4860, Liberty Utilities (CalPeco Electric) LLC ("Liberty") hereby files this Annual Report on Compliance ("ARC") regarding Liberty's 2021 Wildfire Mitigation Plan ("2021 WMP"). This ARC follows the guidance in Table 4 (Section 2) of the Wildfire Safety Division ("WSD") Compliance Operational Protocols issued on February 16, 2021, associated with the California Public Utilities Commission ("CPUC") Rulemaking ("R.") 18-10-007.

I. ASSESSMENT OF LIBERTY'S 2021 WMP INITIATIVES

WSD Guidance: Submit an assessment of whether Liberty 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. If Liberty 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.

A. Overall 2021 WMP

In accordance with Cal. Pub. Util. Code § 8386(a), Liberty constructs, maintains, and operates its electric system in a manner that minimizes the risk of catastrophic wildfire posed by its electric power lines and equipment. Liberty's overarching WMP goal is to prevent and mitigate the risk of wildfires caused by utility equipment. In 2021, Liberty continued to identify ways to enhance its wildfire prevention

and mitigation efforts through enhancing or expanding existing programs and developing and implementing new programs. Liberty's overall progress in 2021 implementing its WMP met the risk reduction intent of its 2021 WMP to reduce ignition probabilities and minimize the societal consequences (with specific consideration to the impact on Access and Functional Needs ("AFN") populations and marginalized communities) of both wildfires and the mitigations employed to reduce them, including Public Safety Power Shutoff ("PSPS") events.

B. Risk Assessment and Mapping

Liberty's progress in 2021 related to the Risk Assessment and Mapping WMP initiatives met the risk reduction intent of its 2021 WMP to reduce ignition probabilities and minimize the societal consequences of both wildfires and mitigations employed to reduce them.

Liberty completed its first generation wildfire risk model in early 2021 and utilized modeling outputs in discussions and planning processes related to WMP initiatives. Specifically, Liberty used its circuit risk analysis and fire risk mapping tool to inform planning and prioritize work in WMP initiatives within the Situational Awareness, Grid Design and System Hardening, and Asset Management and Inspections WMP categories. Liberty also continued its work with Reax to scope updates to its wildfire risk model and fire risk map and to expand the underlying dataset to include statewide outages and ignitions. Liberty collected data (*i.e.*, pole risk, vegetation risk, grid hardening mitigations) to update its circuit risk analysis. Additionally, Liberty participates in the Joint IOU Wildfire Risk Modeling Working Group to understand applicable modeling information and approaches among its peer utilities in California.

C. Situational Awareness and Forecasting

Although Liberty did not meet all of its 2021 installation targets related to Situational Awareness and Forecasting WMP initiatives, Liberty did meet the risk reduction intent of its 2021 WMP for this

category to reduce ignition probabilities and minimize the societal consequences of both wildfires and mitigations employed to reduce them. Specifically:

- Liberty's Fire Potential Index ("FPI") that was developed in 2020 is now utilized daily during fire season to determine forecasted fire weather conditions. The FPI has been incorporated into Liberty's Fire Prevention Plan ("FPP"), which includes operating protocols for each FPI rating that are followed by field crews on a daily basis. Liberty's FPI converts environmental, statistical, and scientific data into an easily understood forecast of short-term fire threat for Liberty's service territory. The FPI provides a seven-day fire risk condition forecast for 11 geographic zones within the service territory. FPI condition forecasts include five risk conditions (Low, Moderate, High, Very High, and Extreme) that are used as a means to determine operating procedures, by zone, depending on the forecast fire risk. FPI condition forecasts are communicated to field staff on a daily basis to inform operational decisions when work restrictions are in place due to fire risk. This forecasting granularity provides a better understanding of the overall fire risk throughout the service area and allows for better decision-making in scheduling work by zone.
- Liberty contracted with Texas A&M to deploy 10 Distribution Fault Anticipation ("DFA") units. In 2021, the units were delivered, circuit/substation locations were selected for five units, and additional materials were ordered for their installation. Liberty is determining location feasibility for the remaining five units, and selection will be based on fire risk mapping and substation capability to host the equipment.
- Since 2019, Liberty has installed 29 weather stations that are additionally equipped with fuel moisture sensors across its service territory. The weather station network was utilized

in 2021 and provides valuable weather monitoring and situational awareness information for operational decision-making. Liberty plans to install 10 additional weather stations in 2022 that will expand coverage throughout Liberty's service territory and will prioritize installations based on high fire risk areas and areas where gaps in weather station coverage exist along power lines.

D. Grid Design and System Hardening

Although Liberty did not meet all of its 2021 installation targets related to the Grid Design and System Hardening WMP initiatives, Liberty did meet the risk reduction intent of its 2021 WMP for this category to reduce ignition probabilities and minimize the societal consequences of both wildfires and mitigations employed to reduce them. Specifically, in 2021, Liberty:

- Installed 3.75 miles of covered conductor ("CC") in 2021. Liberty did not meet its 2021 target of 9.1 miles for this initiative because the Tamarack and Caldor fires impacted line construction resources. Additionally, supply chain issues impacted material availability and delayed some CC projects to 2022. Taking into account that some 2021 CC projects have been delayed due to wildfire and supply chain issues, Liberty has adjusted the timelines of CC projects and will discuss the specifics of each CC project in its 2022 WMP Update.
- Replaced 211 poles within its WMP pole replacement initiative, including 169 poles identified as G.O. 165 Level 2 replacements in the system-wide survey that Liberty completed in 2020. Liberty also replaced 175 poles resulting from fire or storm damage in 2021, which impacted available resources. Line crew contracts and material orders are in place to complete the remaining 226 Level 2 pole replacements in 2022.

- Replaced 867 expulsion fuses. Liberty has resolved supply chain issues by expanding the pool of suppliers, and Liberty will maintain its target of 1,500 expulsion fuses for 2022.
- Installed two automatic reclosers. Liberty plans to install four automatic reclosers in 2022 (Liberty initially targeted three in 2021 and three in 2022).
- Removed 37 tree attachments and installed two animal guards. The remaining tree attachment removals targeted for 2021 carried over to 2022.

E. Asset Management and Inspections

Liberty's progress in 2021 related to the Asset Management and Inspections WMP initiatives met the risk reduction intent of its 2021 WMP to reduce ignition probabilities and minimize the societal consequences of both wildfires and mitigations employed to reduce them.

Liberty came close to completing or exceeding all asset inspection targets in its 2021 WMP, including detailed inspections of 210 miles its electric lines, patrol inspections of its entire system, intrusive pole inspections of 3,506 poles, and 46 substation inspections. Additionally, Liberty developed an Asset Inspection Quality Assurance / Quality Control ("QA/QC") Program to be implemented in early 2022. Liberty completed Level 2 remediations using its wildfire risk map to prioritize repairs. Liberty will enhance its asset inspection process and plans to utilize its fire risk map to target areas of highest wildfire risk for its detailed inspections.

F. Vegetation Management and Inspections

Liberty's progress in 2021 related to the Vegetation Management ("VM") and Inspections WMP initiatives met the risk reduction intent of its 2021 WMP to reduce ignition probabilities and minimize the societal consequences of both wildfires and mitigations employed to reduce them.

Liberty's vegetation management program made tremendous progress toward achieving program targets in 2021. In addition to maintaining growth in its existing initiatives, Liberty implemented new

vegetation management and inspection initiatives to continue to enhance its contribution to wildfire mitigation efforts. Key achievements include:

- Completed 3.4 miles of Forest Resilience Corridor projects in cooperation with the United States Forest Service ("USFS"). Liberty was not authorized to implement several planned projects due to permitting issues with USFS. Liberty redirected planned resources for this activity to support the preparation of 443 acres for future project implementation.
- Completed 178 miles of detailed inspections of vegetation around electric lines and equipment.
- Removed 2,119 tons of biomass in its service territory as part of its fuel management initiative.
- Completed 701 miles of LiDAR inspections of vegetation around electric lines and equipment.
- Performed QA/QC of 155 miles of vegetation inspections.
- Completed 238 miles of VM work to remediate at-risk species.
- Completed 128 miles of VM work to remove or remediate trees with strike potential.
- Completed 361 miles of VM work to achieve the minimum clearances set forth in G.O.95.

G. Grid Operations and Operating Protocols

Liberty's progress in 2021 related to the Grid Operations and Operating Protocols WMP initiatives met the risk reduction intent of its 2021 WMP to reduce ignition probabilities and minimize the societal consequences of both wildfires and mitigations employed to reduce them.

In 2021, Liberty installed two automatic reclosers. The operation of these automatic reclosers allows for remote monitoring, which can promote faster outage response and reduce electrical ignition. Additionally, in 2021, Liberty began exploring the use of fast trip/one-shot setting during high fire threat

days to limit energy to overhead faults and minimize the chance of ignition. Liberty is looking at fault detection with communications to determine more quickly the location of the fault when using fast trips to mitigate larger or longer outages.

In 2021, Liberty implemented its PSPS operations and communications protocols. While Liberty did not initiate any proactive de-energization events in 2021, Liberty did activate its Emergency Operations Center ("EOC") in September 2021 to begin coordinating response operations associated with an elevated weather event with the potential for employment of Liberty's PSPS protocol. In addition to considering the input from Liberty's fire science consultant, Reax, which monitored available weather data, Liberty mobilized on-the-ground resources to patrol and assess local conditions. These circuit crews provided input based on real-time risk assessments in the field. In addition to real-time weather conditions, the EOC reviewed and considered local system conditions, input from public safety partners, alternatives to de-energization, and mitigation options.

H. Data Governance

Liberty's progress in 2021 related to the Data Governance WMP initiatives met the risk reduction intent of its 2021 WMP to reduce ignition probabilities and minimize the societal consequences of both wildfires and mitigations employed to reduce them.

In 2021, Liberty made progress related to creating a central data repository for WMP data and metrics. Liberty's overall goal is to develop an integrated data management and reporting solution to improve data consistency and efficiencies internally and for the WMP reporting process. Liberty has three major software upgrades underway that will impact this initiative, including upgrades to its Geographic Information System ("GIS"), Outage Management System ("OMS"), and Responder database. In designing a solution that considers these major system upgrades and integrates with all current data sources, Liberty has initiated conversations and requests for information with consultants offering data

analytics solutions. Liberty looks to expand its technical staffing, training, and wider IT involvement in order to help manage continuous process improvement while balancing the use of external resources.

The results of the System Survey asset inventory completed in 2020 provided the basis for an asset management system that can be used for prioritizing future work based on wildfire risk modeling and fire risk maps and can enable Liberty to respond to infractions with increased speed, volume, and improved accuracy. Throughout 2021, Liberty continued to improve protocols and train its staff on digital field collection forms and integrating data sources that will assist Liberty to further leverage data governance upgrades and adoption of new technologies.

I. Resource Allocation Methodology

Liberty's progress in 2021 related to the Resource Allocation Methodology WMP initiatives met the risk reduction intent of its 2021 WMP to reduce ignition probabilities and minimize the societal consequences of both wildfires and mitigations employed to reduce them.

Liberty completed its first generation wildfire risk model in early 2021 and utilized modeling outputs in discussions and planning processes related to WMP initiatives. Specifically, Liberty used its circuit risk analysis and fire risk mapping tool to inform planning and prioritize work in WMP initiatives within the Situational Awareness, Grid Design and System Hardening, and Asset Management and Inspections WMP categories. Additionally, Liberty will utilize its Risk Spend Efficiency ("RSE") calculations as another component in overall WMP planning and long-term decision-making.

J. Emergency Planning and Preparedness

Liberty's progress in 2021 related to the Emergency Planning and Preparedness WMP initiatives met the risk reduction intent of its 2021 WMP to reduce ignition probabilities and minimize the societal consequences of both wildfires and mitigations employed to reduce them.

In 2021, Liberty implemented four major activations of its Emergency Operations Plan. Activations occurred in response to the Tamarack Fire on July 16, 2021 and the Caldor Fire on August 30, 2021, a high-wind event on September 16, 2021, and a winter storm response on December 23, 2021.

While Liberty did not initiate any proactive de-energization events in 2021, Liberty did activate its Emergency Operations Center for a high-wind event in September 2021. While it was not a PSPS event, Liberty utilized its PSPS operations and communications protocols and successfully initiated its notification processes. Liberty notified impacted customers, including MBL customers. During the high-wind event, Liberty performed positive or affirmative communication with its potentially impacted MBL customers in the form of Everbridge notifications, personal calls, and home visits when needed. Liberty also notified its public safety partners, CBOs and critical facilities during the high-wind event. Liberty held two workshops—one for public safety partners, CBOs, and critical facilities and one for customers and the community—to communicate current information about the high-wind event.

Liberty attended or participated in 23 meetings with various community leaders or public safety partners to share information on Liberty's wildfire mitigation, PSPS preparedness, and community outreach efforts. Liberty held four regional PSPS workshops and one PSPS tabletop exercise. Liberty hosted four regional virtual town halls to provide a localized update on wildfire safety work happening in respective communities. Liberty conducted training and updated personnel work procedures in conditions of elevated fire risk for field personnel. Liberty executed comprehensive wildfire safety and PSPS preparedness outreach, using lessons learned and feedback received from other IOUs, customers, the Commission, and other stakeholders. Liberty also conducted community outreach to educate public safety partners, customers, and the general public on aspects of its wildfire mitigation practices, such as vegetation management and system hardening, and the role they play in helping to reduce wildfire risks

in their communities. Liberty made improvements and conducted in-office training field-related training to existing personnel work procedures in conditions of elevated fire risk.

K. Stakeholder Cooperation and Community Engagement

Liberty's progress in 2021 related to the Stakeholder Cooperation and Community Engagement WMP initiatives met the risk reduction intent of its 2021 WMP to reduce ignition probabilities and minimize the societal consequences of both wildfires and mitigations employed to reduce them.

In 2021, Liberty launched a digital ad campaign specific to Wildfire Mitigation and PSPS preparation and awareness. Topics included defensible space, emergency preparedness, medical baseline program information, general PSPS information and preparation tips, communication of PSPS public workshops and the importance of updating contact information in Liberty systems to enable PSPS and emergency notifications. Liberty also continued its public education and outreach efforts associated with its WMP, focusing on personal preparedness and community resiliency. Liberty attended or participated in 23 meetings with public safety partners to share information related to Liberty's wildfire mitigation efforts, PSPS preparedness, and community outreach. Liberty held four regional PSPS workshops and one PSPS tabletop exercise. Liberty hosted four regional virtual town halls to provide a localized update on wildfire safety work happening in respective communities. Liberty placed 36 posts on Liberty's social media channels, sent five print and digital ads, sent five bill inserts and direct mailers to customers; and conducted five customer e-mail outreach campaigns. Liberty also updated its website to share 211 information and to help customers self-identify as Access and Functional Needs ("AFN").

Liberty continued to engage Community-Based Organizations ("CBOs") and Public Safety Partners ("PSP"). These engagements are essential to preparing customers and stakeholders for potential PSPS events, and increased focus on these relationships and communication has driven Liberty's resource additions and bandwidth to perform additional outreach, feedback collection, and networking. Additional

positions were added in 2021 to expand CBO relationship networks and communications channels, including a bilingual Outreach Coordinator.

II. 2021 WMP CHANGE ORDERS AND OTHER OPERATIONAL CHANGES

WSD Guidance: Submit 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.

A. Change Orders

Liberty did not file any change orders in 2021 for its 2021 WMP.

B. Operational Changes

Liberty's FPI that was developed in 2020 is now utilized daily during fire season to determine forecasted fire weather conditions. The FPI has been incorporated into Liberty's Fire Prevention Plan ("FPP"), which includes operating protocols for each FPI rating that are followed by field crews on a daily basis.

Liberty completed its first generation wildfire risk model in early 2021 and utilized modeling outputs in discussions and planning processes related to WMP initiatives. Specifically, Liberty used its circuit risk analysis and fire risk mapping tool to inform planning and prioritize work in WMP initiatives within the Situational Awareness, Grid Design and System Hardening, and Asset Management and Inspections WMP categories.

III. 2021 WMP INITIATIVE SPEND

WSD Guidance: Submit descriptions of all planned WMP initiative spend vs. actual WMP initiative spend and an explanation of any differentials between the planned and actual spends.

A. Planned 2021 WMP Initiative Spend vs. Actual 2021 WMP Initiative Spend

Table 1: Planned 2021 WMP Initiative Spend vs. Actual 2021 WMP Initiative Spend

2021 WMP Initiative #	Initiative Activity	Planned 2021 Spend	Actual 2021 Spend	Explanation of Differential
7.3.1.1	A summarized risk map that shows the overall ignition probability and estimated wildfire consequence along the electric lines and equipment	$10,000	$52,535	Forecast did not include 2021 costs to complete first generation wildfire risk model.
7.3.1.2	Climate-driven risk map and modelling based on various relevant weather scenarios	$0	$0	-
7.3.1.3	Ignition probability mapping showing the probability of ignition along the electric lines and equipment	$0	$0	-
7.3.1.4	Initiative mapping and estimation of wildfire and PSPS risk-reduction impact	$0	$0	-
7.3.1.5	Match drop simulations showing the potential wildfire consequence of ignitions that occur along the electric lines and equipment	$0	$0	-
7.3.2.1	Advanced weather monitoring and weather stations	$120,000	$20,341	Tamarack and Caldor fire responses and supply chain issues impacted Liberty's ability to meet installation targets.
7.3.2.2	Continuous monitoring sensors	$165,000	$246,669	While the Tamarack and Caldor fire responses impacted Liberty's ability to meet installation targets, the increased costs reflect inclusion of DFA costs related to Texas A&M collaboration (forecasted in 7.3.7.2 for 2021).
7.3.2.3	Fault indicators for detecting faults on electric lines and equipment	$0	$0	-
7.3.2.4	Forecast of a fire risk index, fire potential index, or similar	$10,000	$14,490	Higher than expected costs related to FPI.
7.3.2.5	Personnel monitoring areas of electric lines and equipment in elevated fire risk conditions	$0	$0	-
7.3.2.6	Weather forecasting and estimating impacts on electric lines and equipment	$0	$0	-

2021 WMP Initiative #	Initiative Activity	Planned 2021 Spend	Actual 2021 Spend	Explanation of Differential
7.3.3.1	Capacitor maintenance and replacement program	$0	$0	-
7.3.3.2	Circuit breaker maintenance and installation to de-energize lines upon detecting a fault	$500,000	$87,622	Liberty replaced one oil circuit breaker in 2021 and plans to replace three in 2022.
7.3.3.3	Covered conductor installation	$16,564,617	$10,550,330	The Tamarack and Caldor fires impacted line construction resources. Additionally, supply chain issues impacted material availability, which delayed the Topaz CC project to 2022. The Topaz project was also impacted by new Caltrans permitting requirements. The Cathedral A CC project was partially completed in 2021 and will be completed in 2022 when the snow melts and construction can continue.
7.3.3.4	Covered conductor maintenance	$0	$0	-
7.3.3.5	Crossarm maintenance, repair, and replacement	$0	$0	-

2021 WMP Initiative #	Initiative Activity	Planned 2021 Spend	Actual 2021 Spend	Explanation of Differential
7.3.3.6	Distribution pole replacement and reinforcement, including with composite poles	$10,605,000	$5,002,532	The Tamarack and Caldor fires impacted line construction resources and supply chain issues impacted the timing of material availability. All pole replacement designs were completed in 2021. Liberty replaced 174 poles Tier 2 poles in 2021, out of Liberty's WMP target of 400 Tier 2 poles. Liberty also replaced 13 poles associated with its intrusive pole inspections. Liberty also replaced approximately 175 poles resulting from fire or storm damage in 2021 (costs not captured in WMP costs) which impacted available resources.
7.3.3.7	Expulsion fuse replacement	$1,200,000	$599,778	Tamarack and Caldor fire responses and supply chain issues impacted Liberty's ability to meet installation targets.
7.3.3.8	Grid topology improvements to mitigate or reduce PSPS events	$0	$144,465	Costs not forecasted for this initiative in 2021.
7.3.3.9	Installation of system automation equipment	$300,000	$338,764	Costs were higher than expected for the two automatic reclosers installed in 2021.
7.3.3.10	Maintenance, repair, and replacement of connectors, including hotline clamps	$0	$0	-
7.3.3.11	Mitigation of impact on customers and other residents affected during PSPS event	$0	$0	-
7.3.3.12	Other corrective action	$2,290,000	$2,015,895	Within margin of error for cost forecasts.
7.3.3.13	Pole loading infrastructure hardening and replacement program based on pole loading assessment program	$0	$0	…
7.3.3.14	Transformers maintenance and replacement	$0	$0	-
7.3.3.15	Transmission tower maintenance and replacement	$0	$0	-

2021 WMP Initiative #	Initiative Activity	Planned 2021 Spend	Actual 2021 Spend	Explanation of Differential
7.3.3.16	Undergrounding of electric lines and/or equipment	$1,445,414	$902,605	…
7.3.3.17	Updates to grid topology to minimize risk of ignition in HFTDs	$0	$0	-
7.3.4.1	Detailed inspections of distribution electric lines and equipment	$200,000	$409,195	Exceeded the target for this initiative by approximately 400%.
7.3.4.2	Detailed inspections of transmission electric lines and equipment	$0	$0	-
7.3.4.3	Improvement of inspections	$150,000	$0	No costs incurred for this initiative in 2021.
7.3.4.4	Infrared inspections of distribution electric lines and equipment	$35,000	$0	No costs incurred for this initiative in 2021.
7.3.4.5	Infrared inspections of transmission electric lines and equipment	$0	$0	-
7.3.4.6	Intrusive pole inspections	$147,000	$158,021	O&M costs associated with intrusive pole inspections captured in this initiative. Pole replacement costs captured in 7.3.3.6.
7.3.4.7	LiDAR inspections of distribution electric lines and equipment	$0	$0	…
7.3.4.8	LiDAR inspections of transmission electric lines and equipment	$0	$0	-
7.3.4.9	Other discretionary inspection of distribution electric lines and equipment, beyond inspections mandated by rules and regulations	$2,300,000	$1,075,825	Tamarack and Caldor fire responses and supply chain issues impacted Liberty's ability to meet targets.
7.3.4.10	Other discretionary inspection of transmission electric lines	$0	$0	-
7.3.4.11	Patrol inspections of distribution electric lines and equipment	$0	$0	-
7.3.4.12	Patrol inspections of transmission electric lines and equipment	$0	$0	-
7.3.4.13	Pole loading assessment program to determine safety factor	$100,000	$0	No costs incurred for this initiative in 2021.
7.3.4.14	Quality assurance / quality control of inspections	$35,000	$0	No costs incurred for this initiative in 2021.
7.3.4.15	Substation inspections	$10,000	$0	No costs incurred for this initiative in 2021.

2021 WMP Initiative #	Initiative Activity	Planned 2021 Spend	Actual 2021 Spend	Explanation of Differential
7.3.5.1	Additional efforts to manage community and environmental impacts	$750,000	$649,784	Liberty was not authorized by the National Forest Service to implement several planned projects in 2021.
7.3.5.2	Detailed inspections of vegetation around distribution electric lines and equipment	$610,000	$701,089	Higher than expected costs related to detailed inspections.
7.3.5.3	Detailed inspections of vegetation around transmission electric lines and equipment	$0	$0	-
7.3.5.4	Emergency response vegetation management due to red flag warning or other urgent conditions	$0	$0	-
7.3.5.5	Fuel management and reduction of “slash” from vegetation management activities	$2,000,000	$1,196,446	Lower than expected costs related to fuel management activities, partially related to the redirections of crews to post-fire mitigation work (7.3.5.21) that was unforeseen.
7.3.5.6	Improvement of inspections	$0	$0	-
7.3.5.7	LiDAR inspections of vegetation around distribution electric lines and equipment	$820,000	$653,480	Project delays due to smoke and airspace restrictions from wildfires caused carryover into 2022
7.3.5.8	LiDAR inspections of vegetation around transmission electric lines and equipment	$0	$0	-
7.3.5.9	Other discretionary inspections of vegetation around distribution electric lines and equipment	$0	$2,096	-
7.3.5.10	Other discretionary inspections of vegetation around transmission electric lines and equipment	$0	$0	-
7.3.5.11	Patrol inspections of vegetation around distribution electric lines and equipment	$450,000	$337,829	Lower than expected costs related to patrol inspections.
7.3.5.12	Patrol inspections of vegetation around transmission electric lines and equipment	$0	$0	-
7.3.5.13	Quality assurance / quality control of vegetation inspections	$250,000	$141,118	This initiative was implemented mid-year 2021 and the actual costs reflect six months of work.

2021 WMP Initiative #	Initiative Activity	Planned 2021 Spend	Actual 2021 Spend	Explanation of Differential
7.3.5.14	Recruiting and training of vegetation management personnel	$0	$0	-
7.3.5.15	Remediation of at-risk species	$5,500,000	$4,677,999	The reduction in planned costs was partially related to the redirections of crews to post-fire mitigation work (7.3.5.21) that was unforeseen.
7.3.5.16	Removal and remediation of trees with strike potential to electric lines and equipment	$2,200,000	$1,222,174	The reduction in planned costs was partially related to the redirections of crews to post-fire mitigation work (7.3.5.21) that was unforeseen.
7.3.5.17	Substation inspection	$0	$0	-
7.3.5.18	Substation vegetation management	$0	$0	-
7.3.5.19	Vegetation inventory system	$0	$0	-
7.3.5.20	Vegetation management to achieve clearances around electric lines and equipment	$1,000,000	$984,676	Actual costs approximately 1.5% different from forecast; Liberty considers this within margin of error for cost forecasts.
7.3.6.1	Automatic recloser operations	$0	$0	-
7.3.6.2	Protective equipment and device settings	$0	$0	-
7.3.6.3	Crew-accompanying ignition prevention and suppression resources and services	$0	$0	-
7.3.6.4	Personnel work procedures and training in conditions of elevated fire risk	$250,000	$250,202	N/A
7.3.6.5	Protocols for PSPS re-energization	$0	$0	-
7.3.6.6	PSPS events and mitigation of PSPS impacts	$0	$101,158	No costs forecasted for this initiative in 2021. Costs related to potential September PSPS event captured.
7.3.6.7	Stationed and on-call ignition prevention and suppression resources and services	$298,000	$46,426	Liberty purchased one out of two forecasted vehicles in 2021. Labor costs forecasted in this initiative captured in other initiatives.

2021 WMP Initiative #	Initiative Activity	Planned 2021 Spend	Actual 2021 Spend	Explanation of Differential
7.3.7.1	Centralized repository for data	$162,500	$10,058	Labor costs forecasted captured in 7.3.8.1 and forecasted software upgrade costs not incurred.
7.3.7.2	Collaborative research on utility ignition and/or wildfire	$255,000	$101,263	Forecasted DFA costs associated with Texas A&M project captured in 7.3.2.2.
7.3.7.3	Documentation and disclosure of wildfire-related data and algorithms	$0	$0	-
7.3.7.4	Tracking and analysis of near miss data	$0	$0	-
7.3.8.1	Allocation methodology development and application	$123,750	$310,590	Additional labor costs captured in 7.3.8.1.
7.3.8.2	Risk reduction scenario development and analysis	$0	$0	-
7.3.8.3	Risk spend efficiency analysis	$0	$0	-
7.3.9.1	Adequate and trained workforce for service restoration	$899,598	$460,001	Less than forecasted labor costs. Some WMP-related labor costs are in base rates and not separately captured in WMP initiatives.
7.3.9.2	Community outreach, public awareness, and communications efforts	$0	$0	-
7.3.9.3	Customer support in emergencies	$0	$0	-
7.3.9.4	Disaster and emergency preparedness plan	$0	$0	-
7.3.9.5	Preparedness and planning for service restoration	$0	$0	-
7.3.9.6	Protocols in place to learn from wildfire events	$0	$0	-
7.3.10.1	Community engagement	$251,250	$102,097	Lower than expected costs related to communication and outreach.
7.3.10.2	Cooperation and best practice sharing with agencies outside CA	$0	$0	-
7.3.10.3	Cooperation with suppression agencies	$0	$0	-
7.3.10.4	Forest service and fuel reduction cooperation and joint roadmap	$0	$0	-
TOTAL		**$52,007,129**	**$33,567,552**	**-**

IV. 2021 WMP INITIATIVE IMPACT ON PSPS

WSD Guidance: Submit 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.

A. 2021 WMP Initiative Impact on PSPS Thresholds

Liberty's PSPS thresholds are currently fixed and do not change based on initiative progress. Liberty anticipates that, as these initiatives progress, more data can be used to evaluate wildfire risk reduction impacts. Liberty may find a different way to combine existing fire and weather based threshold modeling with initiative risk reduction.

B. WMP Initiative Impact on Frequency, Scale, Scope and Duration of PSPS Events

Most WMP initiatives generally support Liberty's vision for mitigating PSPS events and customer impacts resulting from PSPS events. Specifically, the combination of covered conductor installations, resiliency corridors, and microgrids will reduce impacts and frequency of PSPS events and service interruptions. Liberty's enhancements to its 2022 AFN Plan and its PSPS Operations and Communications Playbook will increase support to its customers and communities and are intended to mitigate the impact to customers in the event that Liberty does have to initiate a PSPS event.

In recent years, Liberty has taken many steps to establish its PSPS program through the development of protocols, procedures, and the establishment of PSPS thresholds detailed throughout its 2021 WMP Update. The PSPS work over the last few years, in combination with an anticipated increase in fire weather events (*i.e.*, RFW, longer fire season, high winds, etc.), may lead to more frequent use of PSPS in the next 10 years. Therefore, the information presented in Table 2 below evaluates how implementation of Liberty's 2021 WMP initiatives is anticipated to affect a given PSPS characteristic, rather than whether a PSPS characteristic will increase/decrease in the next 10 years.

Table 2: Anticipated Impact of 2021 WMP Initiatives on PSPS Event Characteristics

PSPS characteristic	Anticipated Impact of 2021 WMP Initiatives	Comments
Number of customers affected by PSPS events (total)	Decrease	A key objective for Liberty is to limit the number of customers impacted by PSPS events through various WMP initiatives. In time, grid hardening efforts such as covered conductor, microgrids, and the addition of sectionalizing devices will help to reduce the number of customers affected by PSPS.
Number of customers affected by PSPS events (normalized by fire weather, *e.g.*, Red Flag Warning line mile days)	Decrease	A key objective for Liberty is to limit the number of customers impacted by PSPS events through various WMP initiatives. In time, grid hardening efforts such as covered conductor, microgrids, and the addition of sectionalizing devices will help to reduce the number of customers affected by PSPS.
Frequency of PSPS events in number of instances where utility operating protocol requires de- energization of a circuit or portion thereof to reduce ignition probability (total)	Decrease	Weather is the primary factor that drives PSPS frequency. In time, grid hardening efforts, such as covered wire and microgrids, will eventually lead to higher thresholds for de-energization, which would potentially reduce the frequency of PSPS events.
Frequency of PSPS events in number of instances where utility operating protocol requires de- energization of a circuit or portion thereof to reduce ignition probability (normalized by fire weather, *e.g.*, Red Flag Warning line mile days)	Decrease	Weather is the primary factor that drives PSPS frequency. In time, grid hardening efforts, such as covered wire and microgrids, will eventually lead to higher thresholds for de-energization, which would potentially reduce the frequency of PSPS events.
Scope of PSPS events in circuit- events, measured in number of events multiplied by number of circuits targeted for de- energization (total)	Decrease	The work that results in reducing impact to customers and the frequency of events will also reduce the scope of PSPS events.
Scope of PSPS events in circuit- events, measured in number of events multiplied by number of circuits targeted for de- energization (normalized by fire weather, *e.g.*, Red Flag Warning line mile days)	Decrease	The work that results in reducing impact to customers and the frequency of events will also reduce the scope of PSPS events.
Duration of PSPS events in customer hours (total)	Decrease	Weather events determine the length of time circuits need to be de-energized. If scope and number of customers are being reduced over time, then re-energization time should decrease, which is a factor in the duration of PSPS events. PSPS training could reduce the duration of PSPS events with increased preparedness.

PSPS characteristic	Anticipated Impact of 2021 WMP Initiatives	Comments
Duration of PSPS events in customer hours (normalized by fire weather, *e.g.*, Red Flag Warning line mile days)	Decrease	Weather events determine the length of time circuits need to be de-energized. If scope and number of customers are being reduced over time, then re-energization time should decrease, which is a factor in the duration of PSPS events. PSPS training could reduce the duration of PSPS events with increased preparedness.

V. 2021 WMP WSD DEFICIENCIES AND LIBERTY CORRECTIVE ACTIONS

WSD Guidance: Submit a summary of all defects within the annual compliance period, the corrective actions taken and the completion and/or estimated completion date.

A. 2021 WMP Deficiencies Identified by Energy Safety

Table 3: 2021 WMP Deficiencies Identified by Energy Safety

Key Area of Improvement Number	Issue Title	Corrective Actions Taken	Completion and/or Estimated Completion Date
Liberty-1	No climate-driven risk mapping	In its next iteration of modeling, Liberty intends to consider future climate projections. Mid-century (2050) projected meteorological inputs will be obtained from a recently published dataset in which Global Circulation Model (GCM) data from the Coupled Model Intercomparison Project (CMIP6) was downscaled to 3-km resolution using Weather Research and Forecasting (WRF). CMIP6 includes variability in Representative Concentration Pathways (RCPs), allowing researchers to examine worst case (SSP5-8.5), middle of the road (SSP3-7.0) and more optimistic (SSP4-6.0) outcomes based on failure or success in enacting climate policies. If the CMIP6 dataset is unable to capture Liberty's entire service territory, the 4-km resolution dataset covering much of North America from the National Center for Atmospheric Research Data Archive will be used instead.	Estimated completion by 2022 WMP Update submission.
Liberty-2	Lack of consistency in approach to wildfire risk modeling across utilities	Liberty participated in the Energy Safety WMP Risk Modeling Workshop on October 5 and 6, 2021. At the workshop, Liberty presented information about its WMP Risk Model. In addition, Liberty submitted its WMP Risk Model Workplan to Energy Safety on October 13, 2021. Liberty actively participates in the Energy Safety WMP Risk Modeling Working Group and collaborates with other utilities and stakeholders to increase risk modeling process transparency.	Energy Safety Risk Modeling Working Group meetings scheduled until September 2022.

Key Area of Improvement Number	Issue Title	Corrective Actions Taken	Completion and/or Estimated Completion Date
Liberty-3	Limited evidence to support the effectiveness of covered conductor (CC)	Liberty participated in the Joint Utility CC Working Group and contributed to the Joint Utility CC Working Group Report.	Liberty will submit the Joint Utility CC Working Group Report with its 2022 WMP Update submission
Liberty-4	Lack of current inspection QA/QC Program	Liberty developed a QA/QC Program for Asset Inspections.	Liberty implemented its QA/QC Program for Asset Inspections in 2022 and will submit program information with its 2022 WMP Update submission.
Liberty-5	Lack of improvement to visual and detailed asset inspections that specifically target assets and asset components with high ignition risk and areas of highest wildfire risk	Liberty remediated level one findings in 2020, regardless of fire risk, and developed an operational plan for prioritizing level two findings by HFTD tier and fire risk. Liberty used the detailed inspection results from the system survey to identify high ignition risk assets based on subject matter expert input that was incorporated in the overall evaluation of fire risk by circuit. Liberty's operations will use the fire risk identifiers to develop a comprehensive inspection program of existing assets.	Ongoing. Liberty will provide an update on this issue in its 2022 WMP Update.
Liberty-6	Inadequate justification of VM inspection frequency	Liberty addressed all OEIS remedies in its November 1, 2021 WMP Progress Report.	Liberty addressed all OEIS remedies in its November 1, 2021 WMP Progress Report.
Liberty-7	Equivocating language used to describe risk-based decision-making improvements	Liberty reports on its WMP risk-based decision-making in measurable, quantifiable, and verifiable language in its WMP Risk Model Workplan, submitted to Energy Safety on October 13, 2021. Liberty is currently conducting its second iteration of wildfire risk modeling. As the modeling methodology is refined, and as the models are updated with more current data, the confidence level of modeling results will increase. With this increased confidence, Liberty intends to share in a more quantifiable way how its risk modeling assists in making wildfire mitigation decisions.	Ongoing.
Liberty-8	Limited discussion on reduction of size, scale, and frequency of PSPS	Liberty is pursuing the following WMP initiatives related to PSPS impact: 1) Use of microgrids and backup batteries to reduce the scope of potential PSPS events; 2) Evaluating the use of a new PSPS decision tree; 3) Evaluating the use of fast trips with fault indicators as a tool to lower ignition possibility, mitigate PSPS impacts, and restore service more quickly; 4) Grid hardening efforts such as covered conductor.	Ongoing. Liberty addresses this issue within this 2021 WMP Annual Report on Compliance and will address within its 2022 WMP Update.

VI. CONCLUSION

Liberty appreciates this opportunity to provide this 2021 WMP Annual Report on Compliance and looks forward to working with Energy Safety and other stakeholders to advance Liberty's wildfire mitigation planning efforts.

Respectfully submitted,

/s/ Jordan Parrillo

Jordan Parrillo
Manager of Regulatory Affairs
Liberty Utilities (CalPeco Electric) LLC
701 National Ave,
Tahoe Vista, CA 96148
Telephone: 530-721-7818
jordan.parrillo@libertyutilities.com

April 4, 2022