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August 3, 2022

DATA REQUEST RESPONSE

LIBERTY UTILITIES (CALPECO ELECTRIC) LLC

Liberty's 2022 WMP Update

Data Request No.: OEIS-LU-22-002
Subject Matter: Liberty's 2022 WMP Update
Originator: Nathan Poon
Due Date: August 3, 2022

REQUEST NO. 1:

Liberty has not provided required "Projected PSPS" information in Table 11: Recent use of PSPS and other PSPS metrics. Provide the information requested in Columns "Q2 2022," "Q3 2022," "Q1 2023," "Q2 2023," "Q3 2023," and "Q4 2023."

RESPONSE TO REQUEST NO. 1:

Refer to Attachment: "Data Request OEIS-LU-22-002_Q1."

REQUEST NO. 2:

On page 188, Liberty indicates it "employs two de-energization decision trees, one for the Topaz and Muller 1296 r3 PSPS zones, and another for all other zones," but does not indicate why. Explain the reason for the different decision trees.

RESPONSE TO REQUEST NO. 2:

Refer to Section 6.1 of Attachment: "Data Request OEIS-LU-22-002_Q2."

REQUEST NO. 3:

On page 182, Liberty indicates two potential PSPS events as well as training exercises and collaboration with stakeholders familiar with PSPS events, have led to lessons learned in the form of post-event reports, hot washes, and cooperator feedback. Liberty states that the lessons learned have been captured in the PSPS playbook, first developed in 2020, with an updated version in 2022 to incorporate additional lessons learned and process flow for executing a PSPS event.

a. Provide a copy of the 2022 PSPS Playbook.

b. Describe improvement themes and types of updates made to the 2022 version.

RESPONSE TO REQUEST NO. 3:

a. Refer to Attachment: "Data Request OEIS-LU-22-002_Q3a."
b. Improvement themes and types of updates made in Liberty's 2022 PSPS Playbook include:
    - Liberty identified the need for a more robust PSPS Liaison Group. Rather than a single Liaison, the revised playbook notes Liaison roles for:
        i. Senior Manager Wildfire Prevention—Public Safety and Critical Infrastructure Liaison
        ii. Manager for Regulatory Affairs—Regulatory Liaison
        iii. Sr Manager for Customer Solutions—CBO Liaison
        iv. Manager Customer Care II—AFN Liaison
    - Previously, Liberty had separate playbooks for PSPS communications and operations. Lessons learned indicated that a single playbook would be more efficient and user-friendly for Liberty staff. Liberty's 2022 PSPS playbook combines both previous PSPS playbooks for communications and operation.
    - Other recent changes by OES reflected in Liberty's 2022 PSPS Playbook include OES name changes for two of the PSPS stages and the new link to submit OES notification forms online.
    - Lessons learned have indicated that the entire ICS Incident Management Team (IMT) is not required for the initial weather review and PSPS decision making process. Liberty's updated PSPS Playbook (page 11) delineates a PSPS Steering Committee with the key decision makers that meet prior to convening the IMT. The PSPS Steering Committee makes PSPS decisions and conducts incident action planning. The full IMT meets subsequently and is briefed on the decisions and the Incident Action Plan. Liberty successfully tested this approach with the 2021 winter storm event and in Liberty's 2022 Table Top exercises.

REQUEST NO. 4:

Regarding its answer to 2022 Utility Wildfire Mitigation Maturity Survey, question C.III.c, "What level of sectionalization does the utility's distribution architecture have?" Liberty indicated it switches in HFTD areas to individually isolate circuits, but not isolate circuits such that no more than 2000, 1000, or 200 customers can be isolated. Does Liberty have plans to develop this capability? If so, what is the timeline and/or plan for achieving increased sectionalization by customers on a circuit? If not, why not?

RESPONSE TO REQUEST NO. 4:

Liberty has 76 sectionalization zones for PSPS events and 46 PSPS forecast zones. Liberty will continue to evaluate whether this is adequate granularity for PSPS switching and will improve sectionalization as appropriate, starting with zones with greater than 2,000 customers. There are no timeline set for this effort as Liberty is currently focused on replacement of existing aging switching infrastructure with state of the art, SCADA operated devices. Liberty's most recent sectionalization zones can be found at this link:
https://libertyutilities.maps.arcgis.com/apps/mapviewer/index.html?layers=7e4989401e9a43edb3b3ab9afd406069

REQUEST NO. 5:

In response 2022 Utility Wildfire Mitigation Maturity Survey question F.III.a, Liberty indicated its PSPS event forecasting is frequently incorrect, and projects reaching accuracy with fewer than 50% of predictions being false positives. This is a regression from 2021, when Liberty reported full maturity with fewer than 25% of predictions being false positives. What is the reason for more false positives being indicated in 2022?

RESPONSE TO REQUEST NO. 5:

Liberty's response to F.III.a is inaccurate. Liberty had one event in 2021 where the PSPS conditions were forecasted to exceed thresholds and the actual PSPS conditions were not met, which is considered a false positive. Liberty did not execute a PSPS for this event. Considering there was one false positive in 2021out of all fire season days, the correct response should be "iv. PSPS event generally forecasted accurately with fewer than 25% of predictions being false positives."

REQUEST NO. 6:

Liberty's response to 2022 Utility Wildfire Mitigation Maturity Survey, question F.V.d. indicated it has "no probability estimates of after event ignitions." To reach full maturity Liberty would need to gain an accurate quantitative understanding of ignition risk following re-energization, by asset, validated by historical data and near misses. Does Liberty have a plan to progress in this area? If so, what is it? If not, why not?

RESPONSE TO REQUEST NO. 6:

Liberty does not have an estimate for probability of post PSPS event ignitions. Liberty has not had a PSPS event and thus has limited historical or near miss data related to PSPS re-energization. Liberty will collect data during PSPS events to use to gain a quantitative understanding of ignition risk following re-energization. Liberty will also monitor other IOU WMP's for information and data related to ignition risk following re-energization.

REQUEST NO. 7:

From 2021 to 2021, as shown in Table 7.2, Liberty had an increase in risk events from "Other" and "Unknown." For instance, there were 74 distribution outages for other in 2021, compared to 52 in 2020.

a. What causes are included under the "Other" category? Provide a breakdown by type of cause.

b. Has Liberty performed any investigations or root cause analyses for the increases in "Other" risk events? If so, provide a summary of results from such analysis, including any lessons learned Liberty has applied to prevent future similar risk events from occurring.

c. How does Liberty lower "Other" category events?

d. Why has Liberty seen an in "Unknown" risk events? How is Liberty working to lower instances of "Unknown" events moving forward?

RESPONSE TO REQUEST NO. 7:

a. The main causes included in the "Other" category are related to weather events, specifically wind and snow unloading.
b. The increase in occurrences of "Other" risk events in Q4 2021 is due to a winter storm event in December 2021.
c. Liberty's grid hardening initiatives are expected to improve reliability and could lower "Other" category risk events associated with weather events. Additionally, Liberty is working to improve its data schema to enable more granular data collection and will continue to implement training around data input and data QA/QC.
d. Liberty's "Unknown" category captures risk events that cannot be specifically identified in its database. The increase in occurrences of "Unknown" risk events in Q4 2021 is likely due to the winter storm event in December 2021 based on the time of the events. High numbers of "Unknown" outages during emergency situations and hazardous conditions are typical due to data input issues. To lower instances of "Unknown" events, Liberty is working to improve its data schema to enable more granular data collection and will continue to implement training around data input and data QA/QC. Additionally, Liberty is working toward increasing communication between system control, dispatch and linemen in the field to decrease the number of "Unknown" events.

REQUEST NO. 8:

the 2021 Wildfire Mitigation Plan Action Statement, Liberty was required to develop programs to target specific equipment failures.

a. What program(s) or solution(s) has Liberty put into place to target and reduce equipment failures overall, particularly for "other" equipment?

b. What program(s) or solution(s) has Liberty put into place to target and reduce transformer failures?

RESPONSE TO REQUEST NO. 8:

In its 2022 WMP Update and prior WMP quarterly reporting, Liberty erroneously reported historical ignition occurrence in Table 7.2: Key recent and projected drivers of ignitions. Liberty erroneously reported two ignitions in 2018 and two ignitions in 2020 from "transformer damage or failure" and two ignitions in 2018, six ignitions in 2019, five ignitions in 2020 and three ignitions in 2021 from "other" ignition drivers. In fact, Liberty has not had any reportable ignitions from "transformer damage or failure" or "other" ignition drivers. Liberty has updated Table 7.2 in its most recent Q2 WMP Quarterly Report (QDR) to reflect its correct historic ignition data. Refer to Attachment: "Data Request OEIS-LU-22-002_Q8 and Q11."

REQUEST NO. 9:

Liberty does not have a separate program for covered conductor maintenance. Has Liberty made any modifications to its existing inspections to specifically address covered conductor (i.e., added covered conductor-specific items to inspection checklists)? If so, provide all supporting material.

RESPONSE TO REQUEST NO. 9:

For Liberty's ACS covered conductor projects, the manufacturer, Hendrix, performs a detailed inspection of the entire project once it is completed. The inspection performed by the manufacturer is documented in a report. Refer to: "Attachment Data Request OEIS-LU-22-002_Q9" as an example manufacturer inspection report. Additionally, Liberty is considering additional items specific to covered conductor to include on its detailed inspection forms.

REQUEST NO. 10:

During a call with Liberty on July 27, 2022, Liberty discussed an undergrounding project targeting resiliency.

a. Is this project covered within the 2022 WMP? If so, provide the relevant page(s) where it is covered.

b. What is the circuit mileage for this project?

c. How was the location and scope of this project selected?

d. How does this project relate to wildfire and/or PSPS risk?

e. What is the timeline for this project (particularly scoping, completion and energization)?

f. In Table 5.3-1, for undergrounding, Liberty shows 1.03 miles was completed in 2021 and 0.36 are targeted for 2022. Is this in relation to Rule 20A projects, or the project discussed in parts (a) through (e) above?

RESPONSE TO REQUEST NO. 10:

a. No.
b. The circuit mileage of the project is 0.4 miles.
c. The location of this project is in South Lake Tahoe adjacent to the Stateline Substation. The 2200 circuit portion of the project is on Montreal Road extending from the substation about 1,100 feet to the northeast ending just north of Heavenly Village Way. The 2300 circuit portion of the project extends about 1,000 feet along the access road southwest of the shopping center from the substation to the point where the existing circuit goes underground close to Lake Tahoe Blvd. Both sections of the project extend underground from the substation to existing underground portions of the circuits.
d. This project hardens key portions of the 2200 and 2300 circuits in locations close to their power source, the Stateline Substation. The project creates a resiliency corridor and mitigates

wildfire ignition potential in a way that is more effective than a conventional overhead line replacement or covered conductor project. It also can lead to the ability to leave the underground portions of these circuits energized during a PSPS event.

e. Liberty is currently in the planning stage on this project and will proceed to design work in 2022. Construction is planned for 2023.
f. Undergrounding data previously submitted did not include this project. The 1.03 miles of undergrounding reported for 2021 was due to a Rule 20 project. The 0.36 miles of undergrounding reported for 2022 is due to undergrounding needed on portions of two of Liberty's covered conductor projects not related to Rule 20.

REQUEST NO. 11:

During a call with Liberty on July 27, 2022, Liberty stated that Table 7.2 was not interpreted correctly, and should have ignition projections included for 2022. Provide Table 7.2 with the correct 2022 projected ignitions.

RESPONSE TO REQUEST NO. 11:

Refer to Attachment: "Data Request OEIS-LU-22-002_Q8 and Q11."

REQUEST NO. 12:

Table 5.3-1 of Liberty's 2022 WMP does not include calculations for the top risk percentages for each initiative. This should include the following:

Additionally, in Table 5.3- 1, utilities must populate the column "Target%/ Top-Risk%" for each 2022 performance target related to initiatives in the following categories: Grid design and system hardening; Asset management and inspections; and Vegetation management and inspections. This column allows utilities to identify the percentage of the target that will occur in the highest risk areas. For example, if a utility targets conducting 85% of its vegetation management program in the top 20% of its risk-areas, it should input "85/20" in this column. In the "Notes" column, utilities must provide definitions and sources for each of the "Top-Risk%" values provided. In the given example above, an acceptable response would be: "The top 20% of risk areas used for this target relate to the circuit segment risk rankings from [Utility Company's] Wildfire Risk Model outputs, as described in [hyperlink to Section XX] of the 2022 WMP Update."

Provide Table 5.3-1 including the top risk percentages.

RESPONSE TO REQUEST NO. 12:

Refer to Attachment: "Data Request OEIS-LU-22-002_Q12." Liberty will provide a supplemental response for Vegetation Management initiatives as soon as possible.

REQUEST NO. 13:

In 2020, Liberty had a high amount of Level 3 findings.

a. How many Level 3 findings did Liberty close in 2021? Provide a breakdown based on date?

b. How many Level 3 findings from 2020 are still open work orders?

c. How many overall open work orders did Liberty have as of July 1, 2022, within HFTD Tiers 2 and 3?

RESPONSE TO REQUEST NO. 13:

a. Liberty completed 565 Level 3 findings in 2021. Refer to Attachment "Data Request OEIS-LU-22-002_Q13a."
b. 7,459.
c. 6,865.

REQUEST NO. 14:

In Table 5.3-1, Liberty shows that it was behind on the following inspection targets in 2021. What was the cause for Liberty to be behind on its target for each of these inspections?

a. Detailed inspections of distribution electric lines and equipment.

b. Intrusive pole inspections.

c. Detailed inspections of vegetation around distribution electric lines and equipment.

RESPONSE TO REQUEST NO. 14:

a. Liberty completed 59.8 miles of detailed inspections in 2021 out of a target of 52 miles. In its 2022 WMP Update, Liberty erroneously reported 20 miles of detailed inspections completed in 2021.
b. Liberty completed 3,506 intrusive pole inspections in 2021 out of a target of 3,600. As stated in "Energy Safety to LU – DR-068 – Q4 QIU Status_Response_Final_Revised," Liberty completed 97% of the forecasted intrusive pole inspections in 2021. Liberty considers this within a reasonable forecast range given the many variables that can impact an inspection schedule and quantity estimate over the course of a year.
c. Liberty completed 177.9 miles of detailed vegetation inspections in 2021 out of a target of 207 miles. As stated in "Energy Safety to LU – DR-068 – Q4 QIU Status_Response_Final_Revised," Liberty projected ground-based vegetation inspections in two categories. Liberty estimated completing 207 miles of detailed inspections and 150 miles of patrol inspections for a total of 357 miles. During the course of the year, Liberty determined that increasing patrol inspections was appropriate due to the prevalence of dead/dying trees, which caused a decrease in miles of detailed inspections after reallocating resources to address the need for more patrol inspections. Liberty completed a combined total of 356.9 ground-based vegetation inspections.

REQUEST NO. 15:

On a call with Liberty on July 27, 2022, Liberty discussed completion of interim QA/QC for asset inspections while the formal program was being developed.

a. Describe the process(es) used for the interim QA/QC of asset inspections.

b. What percentage of asset inspections underwent the interim QA/QC process? Provide a percentage for each type of inspection (pole intrusion, transmission, distribution, etc.).

c. Provide the results of the interim QA/QC performed (i.e., the percentage of times inspections had findings), broken down by the same inspection types used in (b).

RESPONSE TO REQUEST NO. 15:

a. For the interim QA/QC process, Liberty internal resources re-inspected a percentage of the poles from the total system survey completed in 2020. These re-inspections were tracked in Liberty's database and comments were included if additional issues were found.
b. Roughly six percent of Liberty's asset inspections underwent the interim QA/QC process. Zero percent was done on pole intrusion (as only 11 pole replacements were identified from intrusive pole inspections). The six percent of re-inspections was a combination of transmission and distribution as Liberty does not differentiate its inspections based on transmission and distribution circuits.
c. Liberty will provide a supplemental response for Response 15c as soon as possible.

REQUEST NO. 16:

In Liberty's 2022 Wildfire Mitigation Plan, Liberty discusses implementing "fast trip/one-shot" settings during "high fire threat days."

a. Describe what settings are used for "fast trip/one-shot."

b. Describe how Liberty defines "high fire threat days" and what thresholds are used for implementing the settings described in (a).

RESPONSE TO REQUEST NO. 16:

a. The settings currently used for fast trip/one-shot are classified as a fast relay curve protective setting. This setting curve is commonly used in the industry for personnel protection while working on energized lines. Fast trips (hot line tag) clear faults quickly, does not allow time for downstream devices to operate, and no auto-reclosing is allowed. In fire mode, Liberty is on one-shot to lockout which allows more time for downstream devices to operate, and no auto-reclosing is allowed.
b. Liberty defines high fire threat days as any Fire Potential Index (FPI) zone with a rating of high or greater for that day. Liberty enables fast trip settings when high winds are in the forecast and conditions are close to PSPS thresholds.

REQUEST NO. 17:

In section 4.4.1 of Liberty's 2021 WMP Update Liberty planned to install High Impedance Fault Detection (HIFD) settings to selected lines and install Distribution Fault Anticipation (DFA) technology in its territory and evaluate through 2022. In Liberty's 2022 WMP Update it appears that neither research proposals or findings from these studies progressed and have new timelines for completion by the end of 2022. Explain why Liberty did not meet the timeline for both the installation of the DFA Technology and the HIFD settings as described in its 2021 WMP Update.

RESPONSE TO REQUEST NO. 17:

For HIFD, the collaborative university had issues with getting the contract terms and schedule established. Additionally, the lead time to complete the required simulations for the study is eight to ten months. This pushed the research phase into 2022 and is currently underway.

For DFA, Liberty internal resources did not have the bandwidth to design and install the project in 2021 as planned. The Tamarack and Caldor fires also contributed to the delay in design. Design, installation and implementation of DFA on ten circuits is on track for 2022.

REQUEST NO. 18:

In Liberty's OEIS-LU-22-001 data request response to Question #2, Liberty attributes its missed 2021 target for weather station installations to challenges obtaining the 10 weather stations due to supply chain issues. Provide verification documentation of the supply chain issue that Liberty experienced in 2021.

RESPONSE TO REQUEST NO. 18:

Liberty does not have documentation of the supply chain issues that Liberty experienced in 2021 related to weather stations. Liberty's understanding of the supply chain issues came from communications with the vendor.

If you have any questions or require any additional information, please contact me at:

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Utility	Liberty
Table No.	11
Date Modified	8/1/2022

Notes:
"PSPS" = Public Safety Power Shutoff
In future submissions update planned upgrade numbers with actuals

Table 11: Recent use of PSPS and other PSPS metrics

			Actual															Projected							
Metric type	**#**	**Outcome metric name**	**2015**	**2016**	**2017**	**2018**	**2019**	**Q1 2020**	**Q2 2020**	**Q3 2020**	**Q4 2020**	**Q1 2021**	**Q2 2021**	**Q3 2021**	**Q4 2021**	**Q1 2022**	**Q2 2022**	**Q3 2022**	**Q4 2022**	**Q1 2023**	**Q2 2023**	**Q3 2023**	**Q4 2023**	**Unit(s)**	**Comments**
1. Recent use of PSPS	1.a.	Frequency of PSPS events (total)	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Number of instances where utility operating protocol requires de-energization of a circuit or portion thereof to reduce ignition probability, per year	
	1.b.	Scope of PSPS events (total)	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Circuit-events, measured in number of events multiplied by number of circuits de-energized per year	
	1.c.	Duration of PSPS events (total)	0	0	0	90	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Customer hours per year	
2. Customer hours of PSPS and other outages	2.a.	Customer hours of planned outages including PSPS (total)		5124	7025	31470	113282	29.8	16742.7	1521.9	31517.2	19409.86	2187	22928.83	67493	9578.2	23250.17	12225.37	49505.1	9672.62	14059.96	12225.37	49505.1	Total customer hours of planned outages per year	
	2.b.	Customer hours of unplanned outages, not including PSPS (total)	112599	111988	133267	75720	246866	6294.2	10143	47305	84162.4	50977.49	8517	61661.16	248103	41609.15	96073.27	54483.08	166132.7	32960.28	38244.42	54483.08	166132.7	Total customer hours of unplanned outages per year	
	2.c.	System Average Interruption Duration Index (SAIDI) (including PSPS)	357.53	213.63	1597.37	287.99	416.51	7.72	12.44	58.01	103.21	62.5171	10.18983	73.77058	297	49.78068	114.9408	65.89029	200.105	40.00593	45.85688	65.89029	200.105	SAIDI index value = sum of all interruptions in time period where each interruption is defined as sum(duration of interruption * # of customer interruptions) / Total number of customers served	
	2.d.	System Average Interruption Duration Index (SAIDI) (excluding PSPS)	357.53	213.63	1597.37	287.99	416.51	7.72	12.44	58.01	103.21	62.5171	10.18983	73.77058	297	49.78068	114.9408	65.89029	200.105	40.00593	45.85688	65.89029	200.105	SAIDI index value = sum of all interruptions in time period where each interruption is defined as sum(duration of interruption * # of customer interruptions) / Total number of customers served	
	2.e.	System Average Interruption Frequency Index (SAIFI) (including PSPS)	2.01	1.47	3.97	2.18	2.96	0.1212	0.078	1.0685	0.2887	0.3883	0.07238	0.547819	1	0.353051	0.52633	0.80816	0.64435	0.287517	0.22557	0.80816	0.64435	SAIFI index value = sum of all interruptions in time period where each interruption is defined as (total # of customer interruptions) / (total # of customers served)	
	2.f.	System Average Interruption Frequency Index (SAIFI) (excluding PSPS)	2.01	1.47	3.97	2.18	2.96	0.1212	0.078	1.0685	0.2887	0.3883	0.07238	0.547819	1	0.353051	0.52633	0.80816	0.64435	0.287517	0.22557	0.80816	0.64435	SAIFI index value = sum of all interruptions in time period where each interruption is defined as (total # of customer interruptions) / (total # of customers served)	
3. Critical infrastructure impacted by PSPS	3.a.	Critical infrastructure impacted by PSPS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Number of critical infrastructure (in accordance with D.19-05-042) locations impacted per hour multiplied by hours offline per year	
4. Community outreach of PSPS metrics	4.a.	# of customers impacted by PSPS	0	0	0	30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	# of customers impacted by PSPS (if multiple PSPS events impact the same customer, count each event as a separate customer)	
	4.b.	# of medical baseline customers impacted by PSPS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	# of customers impacted by PSPS (if multiple PSPS events impact the same customer, count each event as a separate customer)	
	4.c.	# of customers notified prior to initiation of PSPS event	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	# of customers notified of PSPS event prior to initiation (if multiple PSPS events impact the same customer, count each event in which customer was notified as a separate customer)	
	4.d.	# of medical baseline customers notified prior to initiation of PSPS event	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	# of customers notified of PSPS event prior to initiation (if multiple PSPS events impact the same customer, count each event in which customer was notified as a separate customer)	
	4.e.	% of customers notified prior to a PSPS event impacting them	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	=4.a. / 4.c.	
	4.f.	% of medical baseline customers notified prior to a PSPS event impacting them	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	=4.a. / 4.c.	
5. Other PSPS metrics	5.a.	Number of PSPS de-energizations	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Number of de-energizations	
	5.b.	Number of customers located on de-energized circuit	0	0	0	185	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Number of customers	
	5.c.	Customer hours of PSPS per RFW OH circuit mile day	0	0	0	0.03	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	=1.c. / RFW OH circuit mile days in time period	
	5.d.	Frequency of PSPS events (total) - High Wind Warning wind conditions	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Events over time period that overlapped with a High Wind Warning as defined by the National Weather Service	
	5.e.	Scope of PSPS events (total) - High Wind Warning wind conditions	0	0	0	30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Estimated customers impacted over time period that overlapped with a High Wind Warning as defined by the National Weather Service	
	5.f.	Duration of PSPS events (total) - High Wind Warning wind conditions	0	0	0	90	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Customer hours over time period that overlapped with a High Wind Warning as defined by the National Weather Service	

Reax Engineering Inc.
Job # 19-0677

De-energization Thresholds for Prevention of Catastrophic Wildfires

Prepared for Liberty Utilities

Revision 0
August 20, 2019

Prepared by:

Chris Lautenberger, PhD, PE

Document Revision History

Job #	Job Name	Client
19-0677	De-energization Thresholds for Prevention of Catastrophic Wildfires	Liberty Utilities

Revision #	Date	Description	
Rev 0	August 20, 2019	Initial draft.	
		Prepared by: Chris Lautenberger, PhD, PE	**Reviewed by:** Delaney Seeburger
			Reviewed by:
		Prepared by:	**Reviewed by:**
		Prepared by:	**Reviewed by:**
		Prepared by:	**Reviewed by:**

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1.0 INTRODUCTION

Reax Engineering Inc. (Reax) has been retained by Liberty Utilities to recommend thresholds for proactive de-energization of overhead electrical utilities in Liberty Utilities' Public Safety Power Shutoff (PSPS) zones as established by others. This work inherently assumes that all PSPS Zones present equivalent risk of structure loss under analogous fire weather conditions. It is our understanding that Liberty Utilities has identified 46 PSPS zones that can be separately isolated and de-energized.

This report is organized as follows:

- Section 2.0 provides background information that is subsequently applied in Section 3.0 for establishing baseline de-energization thresholds.
- In Section 4.0, historical weather observations and archived forecast data are analyzed to quantify the frequency at which the recommended de-energization thresholds have been exceeded in the past.
- Section 5.0 analyzes fire weather conditions associated with fires of historical significance in and near Liberty's service territory.
- Section 6.0 provides de-energization thresholds and decision trees for each of Liberty Utilities' PSPS zones.
- A summary of this work and concluding remarks are presented in Section 7.0.
- Section 8.0 contains references cited in this report.
- Appendix A contains the fuel moisture sampling plan that is used to support this work.

2.0 BACKGROUND

2.1 Correlation between wind speed and occurrence of electrical outages

Correlation of outage occurrence with wind gust speed shows that wind-caused outages are infrequent for wind gust speeds below 30 mph, but for distribution lines an inflection point exists at a gust speed of approximately 30 mph (13 m/s) [1]. Above 30 mph, outage probability increases by approximately a factor of 10 for every 15 mph increase in wind gust speed [1]. This means that at a wind speed of 45 mph (20 m/s) there is approximately a 10× increase in outage frequency compared to 30 mph winds. This is shown graphically in Figure 1 [2]. Since the same mechanisms that cause outages (flying debris, vegetation contact with conductors, line slap, etc.) may also cause fires, it is reasonable to assume that fire ignition probability also scales similarly with wind gust speed.

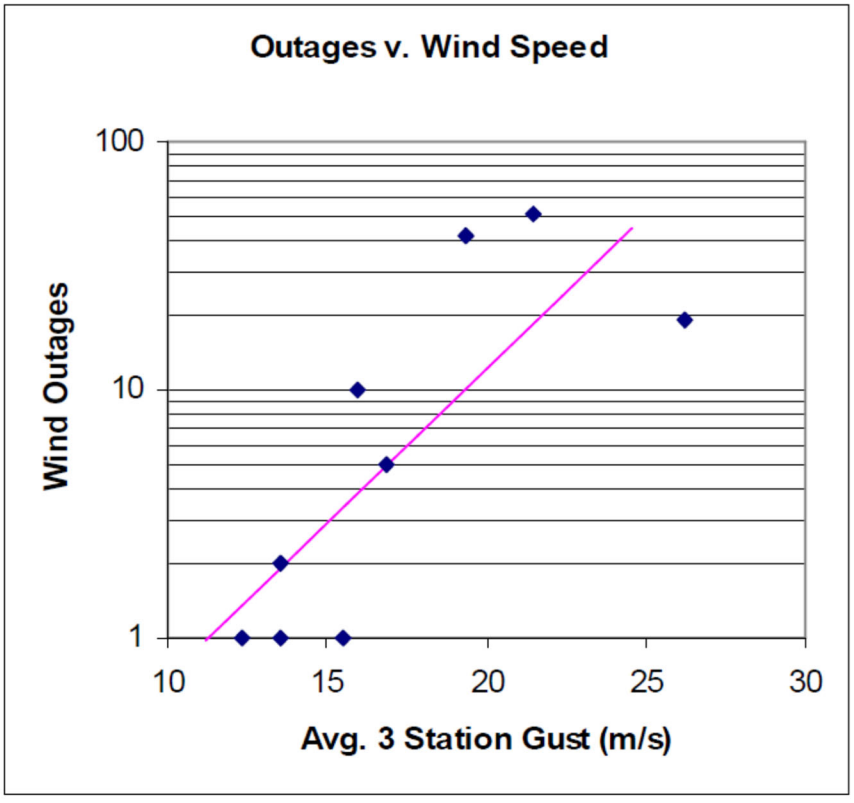


Figure 1. Increase of Outages with gust wind speed [2].

2.2 Wind gust speeds associated with suspected large-loss powerline fires

Surface weather station observations around the time of ignition were analyzed for several catastrophic suspected powerline fires. The results of this analysis are shown in Table 1. Measured gust speed for stations near the suspected ignition locations ranged from 32 mph to 79 mph,

although gust speeds may have been higher at the ignition location, particularly for the lower readings.

Table 1. Observed wind gust speed around time of ignition for weather stations near ignition of suspected powerline fires.

Year	Fire	Wind gust (mph)
2011	Bastrop Complex (TX)	34 - 43
2017	Starbuck (OK, KS)	46 - 53
2017	Tubbs	41 - 79
2017	Atlas, Nuns	32 - 43
2017	Thomas	32 - 40
2018	Woolsey	32 - 52
2018	Camp	52

2.3 Thresholds from California Senate Bill 901 Utility Wildfire Mitigation Plans

Wildfire Mitigation Plans (WMPs) submitted to the California Public Utilities Commission (CPUC) by several utilities on February 6, 2019 were reviewed. The following utilities submitted WMPs:

- Pacific Gas and Electric Company
- Southern California Edison
- San Diego Gas & Electric
- Liberty Utilities/CalPeco Electric
- Bear Valley Electric Service
- PacifiCorp
- NextEra Energy Transmission West
- Trans Bay Cable

Only three of the WMPs provided specific criteria for de-energization. These de-energization thresholds are provided in Table 2:

Table 2. Quantitative de-energization thresholds from CPUC WMPs.

Utility	Wind speed threshold	Additional thresholds
Bear Valley Electric Service	3-second gust > 50 mph	-
Liberty Utilities	3-second gust > 50 mph	-
PacifiCorp	Sustained wind speed of 11 – 17 mph or gust wind speed of 17 – 26 mph	Keetch Byram Drought Index (KBDI) > 282 to 386 and 6-hour averaged Fosberg Fire Weather Index (FFWI) > 15 - 30

3.0 BASELINE PROACTIVE DE-ENERGIZATION THRESHOLD RANGES

The recommended approach for triggering de-energization protocols involves a three part test:

1. Seasonal considerations: Are seasonal conditions associated with intermediate to long term drying (*e.g.*, live fuel moisture content) such that rapidly spreading fires are possible?
2. Wind gusts: Are wind gust speeds high enough to increase the probability of powerline-associated fire ignition?
3. Fire weather: Are fire weather conditions (including temperature and relative humidity) conducive to rapidly spreading fires?

Each of these components is broken down separately in the following sections.

3.1 Seasonal considerations and intermediate to long-term drying

Energy Release Component (ERC) is a key index calculated from Remote Automated Weather Station (RAWS) observations as part of the US National Fire Danger Rating System (NFDRS). The physical meaning of an ERC value is 4% of the energy per unit area that would be released during a fire in units of Btu/f^2. In other words, multiplying an ERC value by 25 gives the number of Btus per square foot that would be released in a fire, *e.g.*, an ERC of 10 corresponds to 250 Btu/sq ft.

ERC depends on live and dead fuel loading by size class (as characterized by an NFDRS fuel model) as well as fuel moisture content of live and dead fuels. In forested areas, ERC values are usually calculated for NFDRS fuel model G which includes a heavy loading of 1000-hour fuels (dead fuels between 3 and 8 inches in diameter). Consequently, ERC for fuel model G (or ERC(G) for short) is therefore quite sensitive to 1000-hour fuel moisture values.

In addition to depending on fuel loading / fuel model, ERC varies daily due to changes in moisture content of both live and dead fuels, which are in turn dependent on antecedent precipitation, relative humidity, and temperature. ERC is a “build up” index that, in the Western US, typically peaks during summer months and drops off after rains return and temperatures drop. Figure 2 shows an example seasonal variation of ERC. Since ERC depends on fuel loading/fuel model at each RAWS station, absolute ERC values are commonly converted to percentiles to facilitate comparison of seasonal ERC trends between RAWS stations with different fuel models. Conversion of an absolute ERC value to a percentile ERC value is accomplished by analyzing historical weather station observations using software developed by the USDA Forest Service known as Fire Family Plus [3].

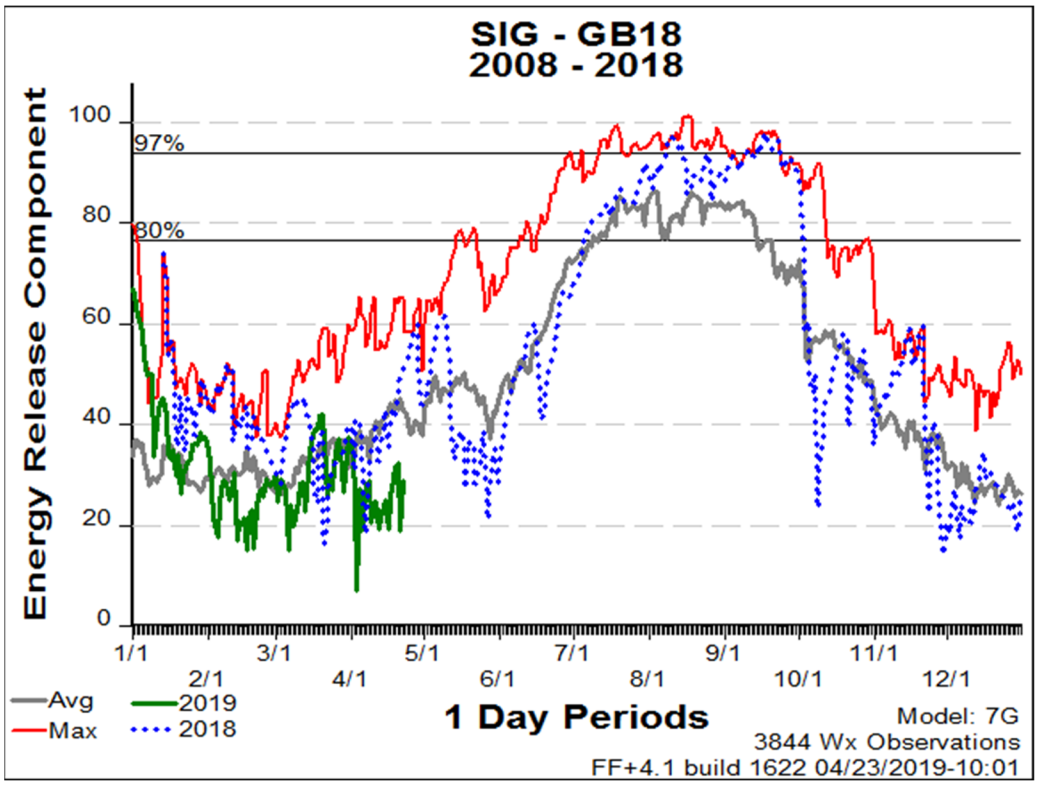


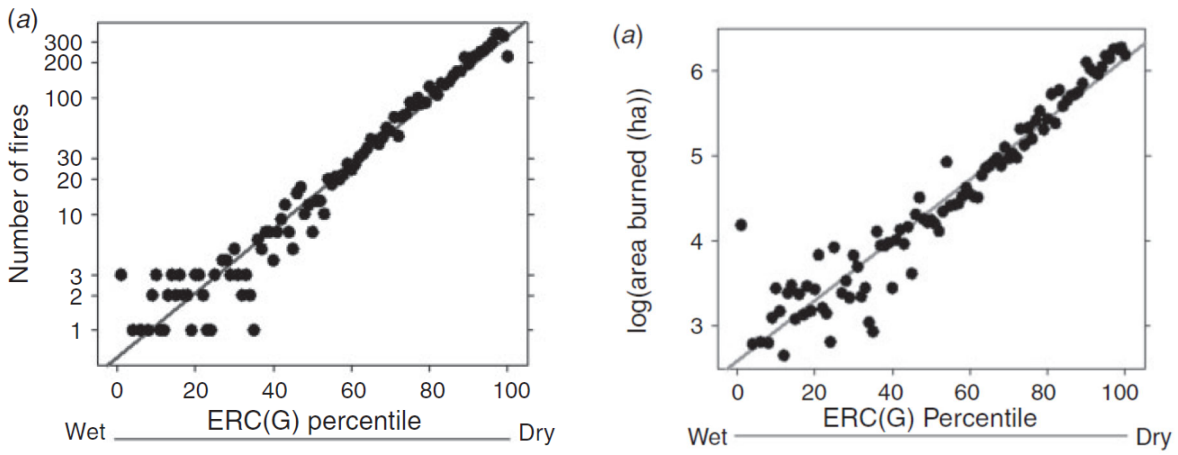
Figure 2. Sample seasonal variation of ERC.

ERC can be thought of as a measure of intermediate to long term drying. It is correlated with the Keetch Byram Drought Index (KBDI), a widely-used measure of drought that is used in the NFDRS to increase fuel loading under drought conditions. KBDI is explained by the United States Forest Service (USFS) Wildland Fire Assessment System (WFAS) as follows [4]:

> Keetch and Byram (1968) designed a drought index specifically for fire potential assessment. It is a number representing the net effect of evapotranspiration and precipitation in producing cumulative moisture deficiency in deep duff and upper soil layers. It is a continuous index, relating to the flammability of organic material in the ground.
>
> The KBDI attempts to measure the amount of precipitation necessary to return the soil to full field capacity. It is a closed system ranging from 0 to 800 units and represents a moisture regime from 0 to 8 inches of water through the soil layer. At 8 inches of water, the KBDI assumes saturation. Zero is the point of no moisture deficiency and 800 is the maximum drought that is possible. At any point along the scale, the index number indicates the amount of net rainfall that is required to reduce the index to zero, or saturation.

Fire occurrence (number of fires) and fire size (area burned) are both strongly correlated with ERC. Figure 3 demonstrates the strong correlation between ERC and fire occurrence/size [5]. Noting that the *y* axes are logarithmic, the relation between ERC and fire occurrence and area burned is

exponential. Comparing ERC percentiles of 50% to 100% shows a 30× increase in number of fires and a 100× increase in fire area.



(a) **(b)**

Figure 3. Correlation of ERC with fire occurrence (a) and fire size (b). From Ref. [5].

Based on these considerations, it is recommended that seasonal factors associated with intermediate to long term drying be quantified here via ERC. The USFS WFAS provides two real-time sources of ERC values. The first provides NFDRS indices – including ERC – based on current observations [6] as well as a one-day weather forecast [7]. Data are provided in tabular form for each reporting RAWS station. As an example, Figure 4 shows forecast NFDRS indices from 7/29/19 for a subset of RAWS stations in Nevada. ERC values are absolute – not percentiles – and 10-hour, 100-hour, and 1000-hour fuel moistures (TEN, HUN, THOU in Figure 4) are given in percentages.

***** California *****	Elev	Lat	Long	Mdl	Tmp	RH	Wind	PPT	ERC	BI	SC	KBDI	HUN	THOU	TEN	STL	ADJ	IC	(Staffing Specs)
40101 CAMP SIX LOOKOUT	3698	41.8	123.8	7G	81	48	5	.00	49	47	8	665	12	12	9	3	M	18	BI / 58/ 66/90/97
40102 GASQUET 2	452	41.8	123.9	7G	85	46	2	.00	41	34	5	789	14	14	9	3	M	15	BI / 42/ 46/90/97
40105 SHIP MTN L.O.	5151	41.7	123.7	7G	76	49	3	.00	59	47	7	595	9	10	8	3	M	15	BI / 71/ 86/90/97
40106 CRAZY PEAK	3970	41.9	123.6	7G	86	39	3	.00	55	46	7	594	10	11	7	4	H	21	ERC/ 44/ 55/90/97
40203 BLUE RIDGE (KNF)	5859	41.2	123.1	7G	81	25	6	.00	71	78	17	230	7	9	5	3	H	50	BI / 93/106/90/97
40217 MT SHASTA	3573	41.3	122.3	7G	88	26	5	.00	64	60	10	537	10	10	6	3	M	36	BI / 68/ 75/90/97
40221 ROUND MOUNTAIN	5255	41.4	121.4	7G	85	24	7	.00	79	68	11	266	6	8	4	4	H	43	ERC/ 79/ 96/90/97
40222 SAWYERS BAR	2455	41.3	123.1	7G	98	20	10	.00	77	96	24	733	7	8	4	4	V	68	BI / 93/104/90/97
40225 SLATER BUTTE	4621	41.8	123.3	7G	85	34	2	.00	70	66	12	701	8	8	6	3	M	31	BI / 80/ 91/90/97
40228 WEED AIRPORT	2929	41.4	122.4	7A	92	23	16	.00	3	42	114	595	7	8	5	4	H	42	BI / 41/ 49/90/97
40231 SOMES BAR	915	41.3	123.4	7G	101	25	4	.00	55	62	13	778	12	11	6	3	H	46	BI / 79/ 86/90/97
40233 INDIAN WELL	4777	41.7	121.5	7F	83	35	4	.00	24	30	6	283	6	7	6	2	M	28	BI / 81/ 97/90/97
40237 COLLINS BALDY LO	5476	41.7	122.9	7G	82	35	4	.00	71	57	8	430	7	8	6	3	M	25	BI / 71/ 83/90/97
40239 QUARTZ HILL	4225	41.5	122.9	7G	89	28	2	.00	81	41	4	575	6	7	5	3	M	21	BI / 55/ 66/90/97
40240 JUANITA	5173	41.8	122.1	7G	83	32	1	.00	69	40	4	250	7	9	6	3	M	17	BI / 60/ 71/90/97
40242 BRAZIE RANCH	3090	41.6	122.6	7B	93	24	6	.00	58	89	27	416	6	7	5	4	H	46	BI / 54/ 98/90/97
40243 VAN BREMMER	5303	41.6	121.7	7G	86	18	5	.00	74	67	12	401	7	9	4	3	H	46	BI / 84/ 96/90/97
40244 ASH CREEK	3677	41.2	121.9	7G	86	29	3	.00	53	40	5	622	11	12	6	3	M	24	BI / 52/ 56/90/97
40245 CALLAHAN #2	3910	41.3	122.8	7G	92	22	9	.00	78	82	17	422	7	7	5	5	V	52	BI / 62/ 68/90/97
40246 DUTCH INDY	2296	41.6	123.4	7G	93	26	6	.00	66	75	17	765	9	9	6	3	H	48	BI / 80/ 91/90/97

Figure 4. Sample USFS NFDRS indices forecast data in tabular form [7].

The second set of real-time ERC values available through the USFS WFAS is a gridded map that is derived from discrete RAWS observations [6]. A web map [8], updated daily at 10:00 UTC, displays ERC values by Spatial Preparedness Level (SPL). As an example, ERC SPL for 7/29/19 is shown in Figure 5. The SPL categories are as follows:

- SPL-I: Less than 58th percentile ERC
- SPL-II: 58th – 78th percentile
- SPL-III: 78th – 92nd percentile
- SPL-IV: 92nd to 97th percentile
- SPL-V: 97th – 99th percentile
- SPL-VI: > 99th percentile

SPL of 4 or higher corresponds to an increased probability of fires escaping initial attack and becoming extended attack fires. For that reason, an ERC percentile of 92 is recommended for use as a de-energization threshold. In other words, if ERC in a PSPS zone is less than 92nd percentile, proactive de-energization would not be initiated because seasonal conditions are such that rapidly spreading fires that become large, extended attack fires are unlikely to occur. In Figure 5, areas that are yellow, orange, or red are at a SPL of 4 or higher, meaning relative ERC values are 92nd percentile or greater.

Operationally, discrete ERC values (Figure 4) and gridded ERC rasters (Figure 5) are ingested into the weather analytics and monitoring system used by Liberty Utilities to monitor current and forecasted weather conditions. The gridded ERC rasters are made available by WFAS via the Web Map Service (WMS) protocol. As an example, the following URL is the http query that provides today's (day 0) ERC values:

https://www.wfas.net/cgi-bin/mapserv?&SERVICE=WCS&20&VERSION=1.0.0&REQUEST=GetCoverage&COVERAGE=erc0percnew&CRS=EPSG:4326&BBOX=-130,20,-60,52&WIDTH=2144&HEIGHT=1376&FORMAT=GEOTIFF_FLOAT

Tomorrow's (day 1) values are obtained by replacing "erc0percnew" in the above query with "erc1percnew", and so on. Currently WFAS provides a 3-day ERC forecast which is used operationally in Liberty Utilities' weather analytics and monitoring system for ERC forecasting. Current and forecast ERC values are assigned to each proactive de-energization zone by running zonal statistics for each of Liberty Utilities' PSPS zones.

As described in Appendix A, fuel moisture sampling will be conducted at six different locations in the Truckee/Tahoe region. This sampling will be conducted during "fire season" at 10 – 14 day intervals or after wetting rains. The purpose of this sampling is to continuously monitor live and dead (primarily 1000-hour) fuel moisture contents. These data provide inputs necessary to calculate ERC percentiles based on field observations when can then be compared to automated values from nearby NFDRS stations.

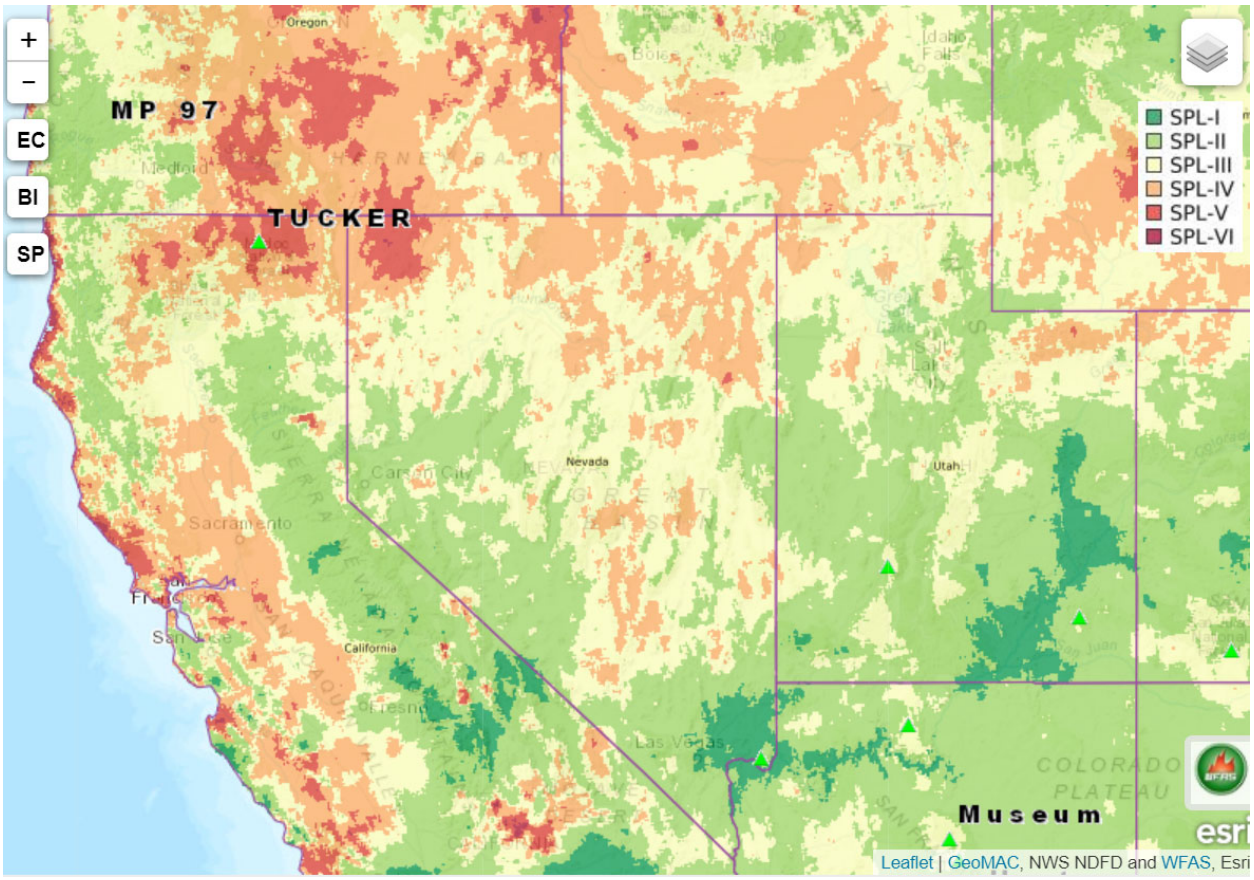


Figure 5. ERC Spatial Preparedness level on 7/29/19.

3.2 Wind gusts

Based on the analyses presented in the background section of this report, a wind gust speed threshold of 40 – 45 mph is recommended as a threshold for de-energization of distribution lines. This value has been shown to correspond to a statistically significant increase in outage occurrence (which is viewed as a proxy for ignition occurrence). Although this value is lower than that identified as a de-energization threshold by Liberty Utilities and BVES (50 mph) in their wildfire mitigation plans, gust speeds measured around the time of ignition of large loss suspected powerline were as low as 32 mph, although wind gusts near the suspected ignition locations may have been higher.

Gust factors are empirically derived equations or graphs that relate wind speed at one averaging interval to wind speed at another averaging interval. A 10-minute average wind speed will be lower than the peak 3-second gust that occurred within that same 10-minute interval. The "Durst curve" [9] (shown in Figure 6) is the most commonly-used source of gust factors. As can be seen from the Durst curve below, the ratio of 3-second gust wind speed to 10-minuted average wind speed (which is what RAWS measures) is approximately 1.43. This means that the 40 mph gust wind speed threshold is equivalent to a 10-minute average wind speed of approximately 40 mph / 1.43 ≈ 28 mph. Therefore, the 40 mph gust threshold can also be viewed as a 28 mph sustained wind speed and a 45 mph gust threshold can be viewed as a 31 mph sustained winds speed.

Since transmission lines typically have less encroaching vegetation than distribution lines, it may be appropriate to use a gust wind speed higher than 40 – 45 mph as a trigger for de-energization of transmission lines. However, unless transmission-specific outage data show a different inflection point when plotted as outage frequency vs. wind gust, the 40 – 45 mph wind gust distribution line threshold is also recommended for application to transmission lines.

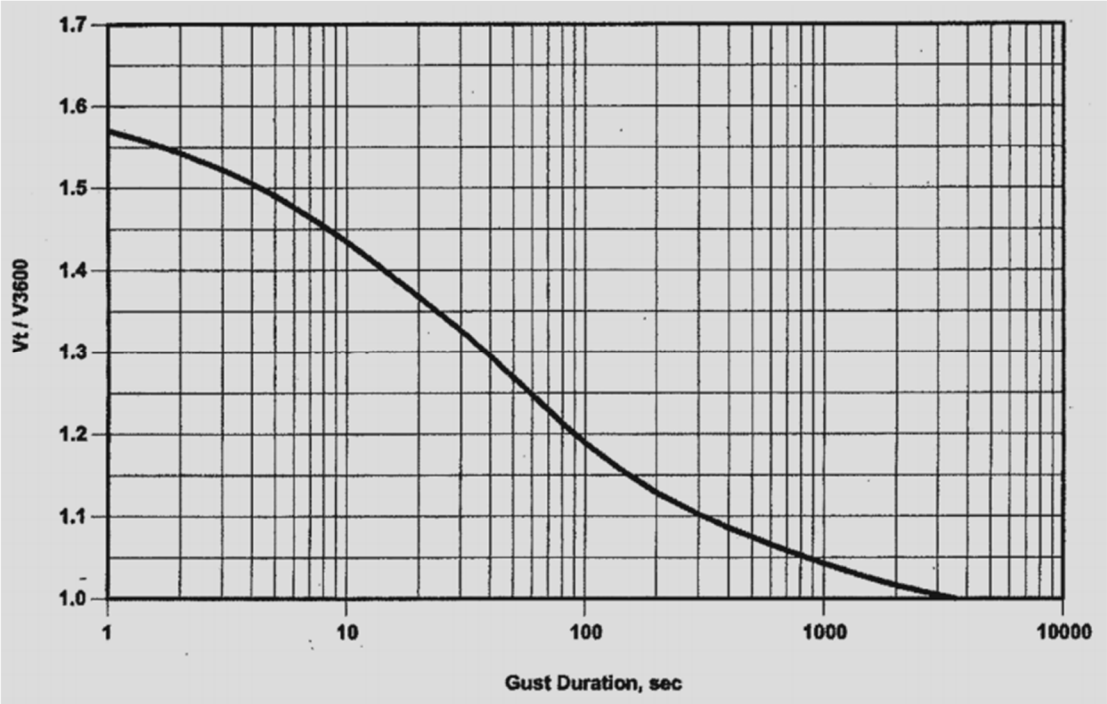


Figure 6. Conventional wind gust factors - Durst curve [9].

3.3 Fire weather

The final criterion that must be met to initiate de-energization protocol is related to fire weather. Essentially, this last test is meant to preclude de-energization during high winds that occur contemporaneously with high humidity and low temperature as such conditions are not conductive to rapidly spreading fires.

The Fosberg Fire Weather Index [10] (FFWI or FWI) is a widely-used index that quantifies the effect of short-term variations in meteorological conditions (temperature, relative humidity, and wind speed) on the potential for wind-driven fire spread. FFWI is based on instantaneous fire weather considerations so it does not consider other factors that may affect fire spread potential such as fuel type, topography, live fuel moisture, or recent precipitation.

Fosberg index is scaled from 0 to 100 such that 100 corresponds to a 30 mph sustained wind and a dead fuel moisture content of zero. Generally, Fosberg indices above 50 – 60 are considered conducive to rapid wind-driven fire spread. For example, NOAA Storm Prediction Center (SPC) personnel wrote [11]: "Generally, for national guidance purposes, temperatures above 60 F, RH

values less than 20%, and sustained surface winds above 20 mph will result in Fosberg values above 50, which is a minimum threshold for critical fire weather conditions. As a general rule, SPC forecasters tend to pay special attention to areas expected to have 3 or more hours of a FWI above 50."

4.0 HISTORICAL EXCEEDANCE OF DE-ENERGIZATION CRITERIA IN LIBERTY UTILITIES' PSPS ZONES

Liberty Utilities has designated 46 PSPS zones:

1) 111 Line
2) 132 Line
3) Portola
4) Sierra Brooks
5) Stampede
6) Russel Valley
7) Hobart
8) Sagehen tap
9) Fir Crags
10) Sunnyside
11) Ward Canyon east
12) Tahoe Park Heights
13) Alpine backside
14) Alpine Meadows and 629
15) Squaw Valley
16) Ward Canyon west
17) Tah 73-17
18) Tah 73-36
19) Tah 73-45
20) Tah 7300 r1
21) Tah 73-60
22) Tah 73-74
23) Angora Ridge and Lily Lake
24) Cathedral Spring Creek Emerald Bay
25) Mey 3400 Angora Creek
26) Mey3300 r3
27) Mey3300 r1
28) Mul 1296 r4
29) Sorensons tap
30) Mul1296 r3
31) Topaz
32) Heavenly lateral
33) Tier 3
34) 640 tier 2
35) 650 Line
36) 669 Line
37) 609 and underbuild
38) 625 Line
39) Bky 5200
40) Old Country Road
41) Tah 52-68
42) The grid

43) Canterbury and Commonwealth
44) Bky 5100 to NVE
45) Beacon tap
46) Glenshire and 608

For the purposes of quantifying historical exceedance frequencies and developing PSPS-specific de-energization thresholds, we have identified five separate groupings:

1) West and north shore
2) South shore
3) Truckee, Glenshire, and Hobart Mills
4) Portola and Sierra Brooks
5) Topaz & Markleeville

The baseline proactive de-energization threshold ranges described in Section 3.0 provide a starting point for developing PSPS zone-specific reasonable risk de-energization thresholds. Historical weather station observations and archived weather forecast data can be analyzed to quantify how frequently various de-energization thresholds have been exceeded in the past so that PSPS zone-specific thresholds can be developed.

Given that proactive de-energization is a last resort for fire prevention, de-energization thresholds must be sufficiently high to prevent unnecessary and/or frequent service interruptions. Through an iterative process, the thresholds shown in Table 3 have been established and are tested against historical weather station observations (Section 4.1) and archived weather forecast data (Section 4.2) to assess historical threshold exceedance frequencies.

Table 3. Thresholds to be assessed in historical threshold exceedance analysis.

Region	ERC(G)	Wind gust (mph)	FFWI (-)
West and north shore	> 92nd percentile	> 40 mph	> 50
South shore	> 92nd percentile	> 40 mph	> 50
Truckee, Glenshire, and Hobart Mills	> 92nd percentile	> 40 mph	> 50
Portola and Sierra Brooks	> 92nd percentile	> 40 mph	> 50
Topaz & Markleeville	> 92nd percentile	> 40 mph	> 50

4.1 Historical weather station observations

4.1.1 West and North shore

Liberty Utilities' PSPS zones on the West and North Shores of Lake Tahoe are shown in Figure 7 relative to the locations of Homewood and Knox 2 RAWS. To provide an estimate of the historical frequency at which the proposed de-energization thresholds have been exceeded, energy release component and wind speed / Fosberg Fire Weather Index statistics are analyzed separately below.

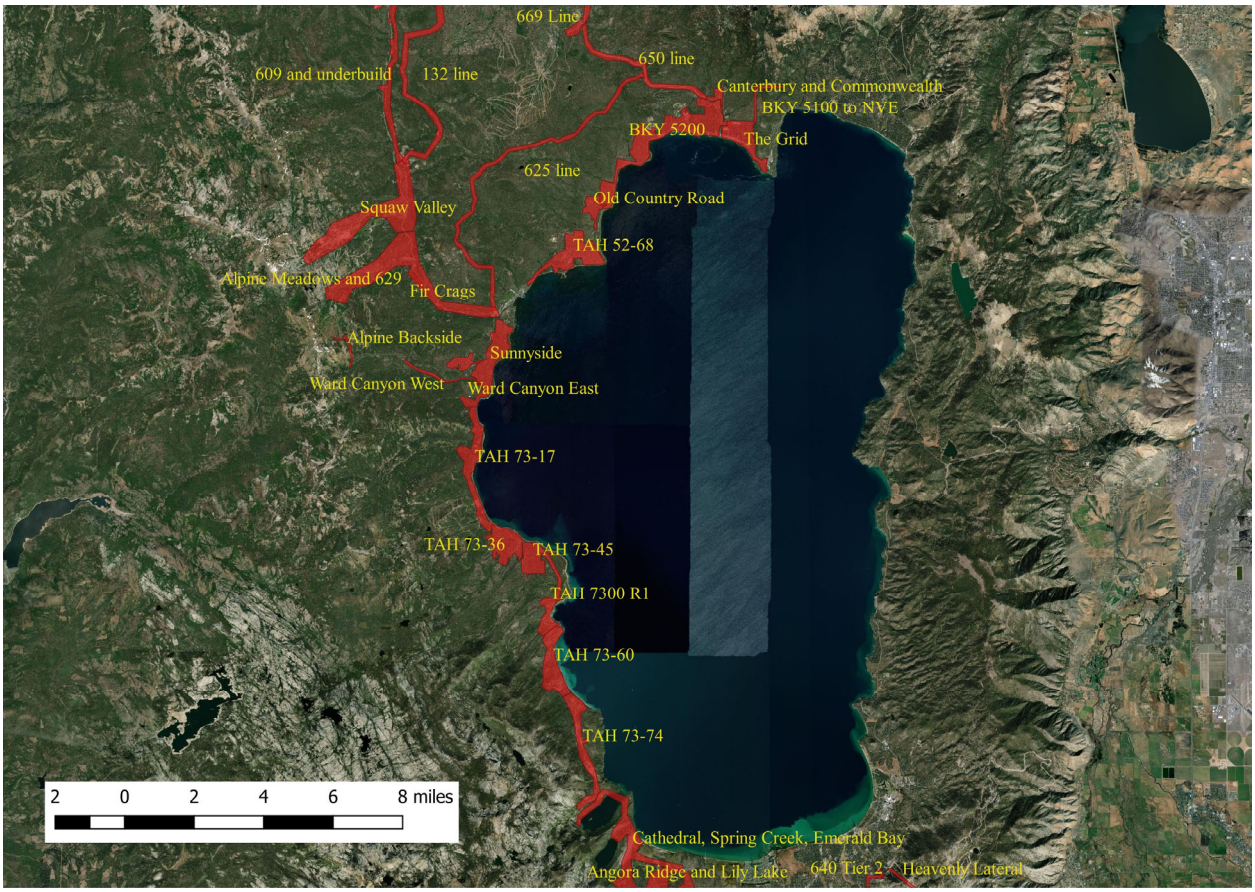


Figure 7. Locations of Liberty Utilities' West and North shore PSPS zones relative to Homewood and Knox 2 RAWS.

Data from Knox 2 and Homewood RAWS were used to create a "Special Interest Group" (SIG), which is a common practice when conducting climatological analyses. Nine years (2010 – 2018) of observations from this SIG were processed to analyze seasonal variations in ERC (using NFDRS Fuel Model G), and the result is plotted in Figure 8. In an average year, ERC does not exceed the 92nd percentile, but in years with below average precipitation and/or higher than average temperatures ERC will likely exceed the 92nd percentile maximum. Figure 8 shows that the maximum ERC has historically exceeded the 92nd percentile from approximately mid-June through late September.

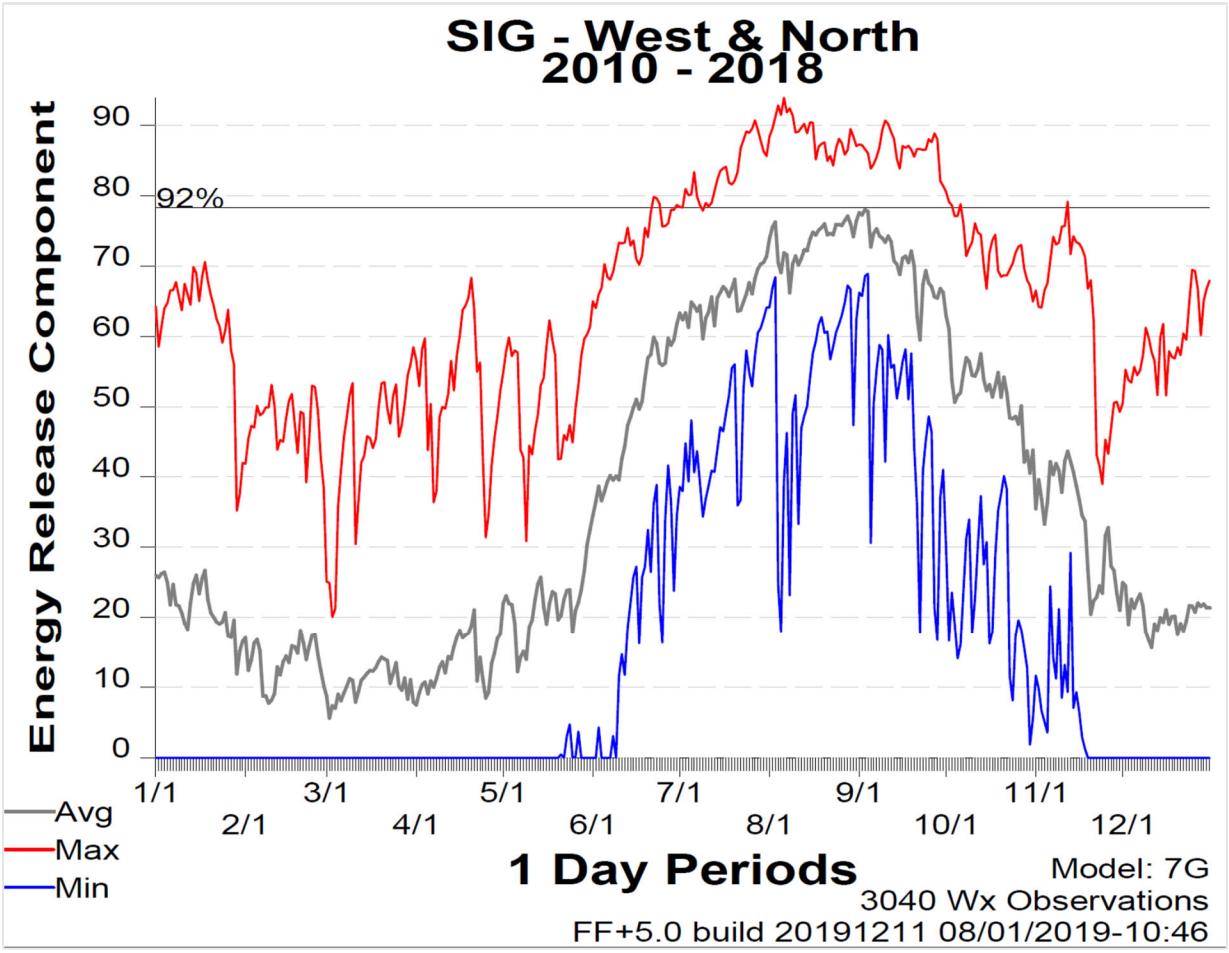


Figure 8. Seasonal variations in ERC (Fuel Model G) in Lake Tahoe SIG.

Scatter plots of measured wind gust vs. FFWI are shown in Figure 9 (Knox 2 / KNXN2) and Figure 10 (Homewood / HMDC1). The period of record plotted for each of these stations is as follows:

- Knox 2 / KNXN2: 2010 – 2018
- Homewood / HMDC1: 2010 – 2018

No exceedances were recorded at Knox 2 RAWS. Although there were several observations at Homewood RAWS where gust & FFWI thresholds were exceeded, they were all "off season" meaning they did not occur in June, July, August, or September when maximum ERC has exceeded 92nd percentile.

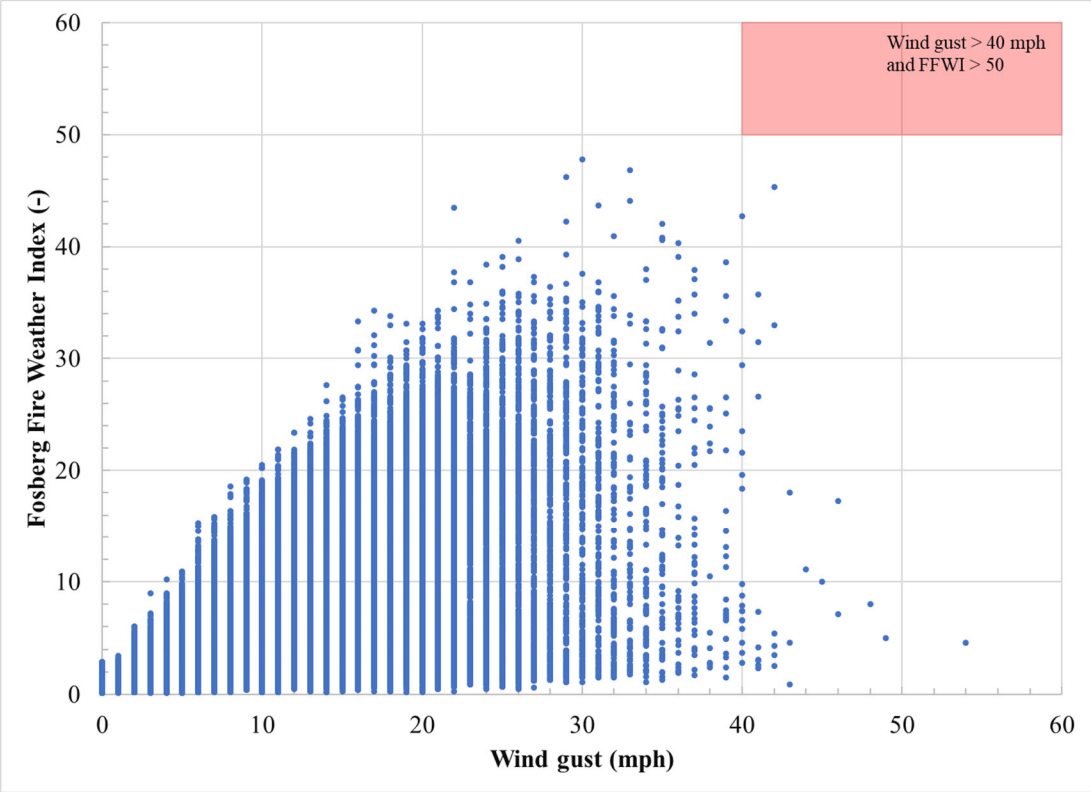


Figure 9. Knox 2 (KNXN2) wind gust vs. FFWI (2010 – 2018).

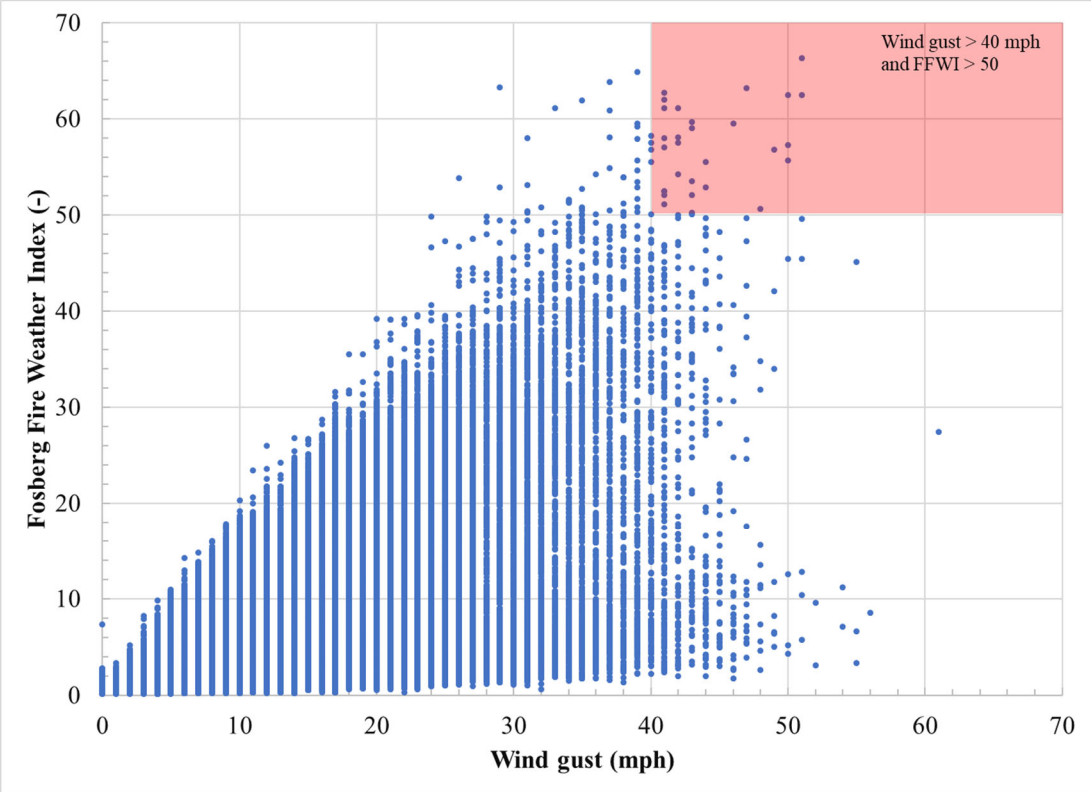


Figure 10. Homewood (HMDC1) wind gust vs. FFWI (2002 – 2018).

4.1.2 South shore

The locations of Baron RAWS and the NWS station at South Lake Tahoe airport relative to Liberty Utilities' South Shore PSPS zones are shown in Figure 11.

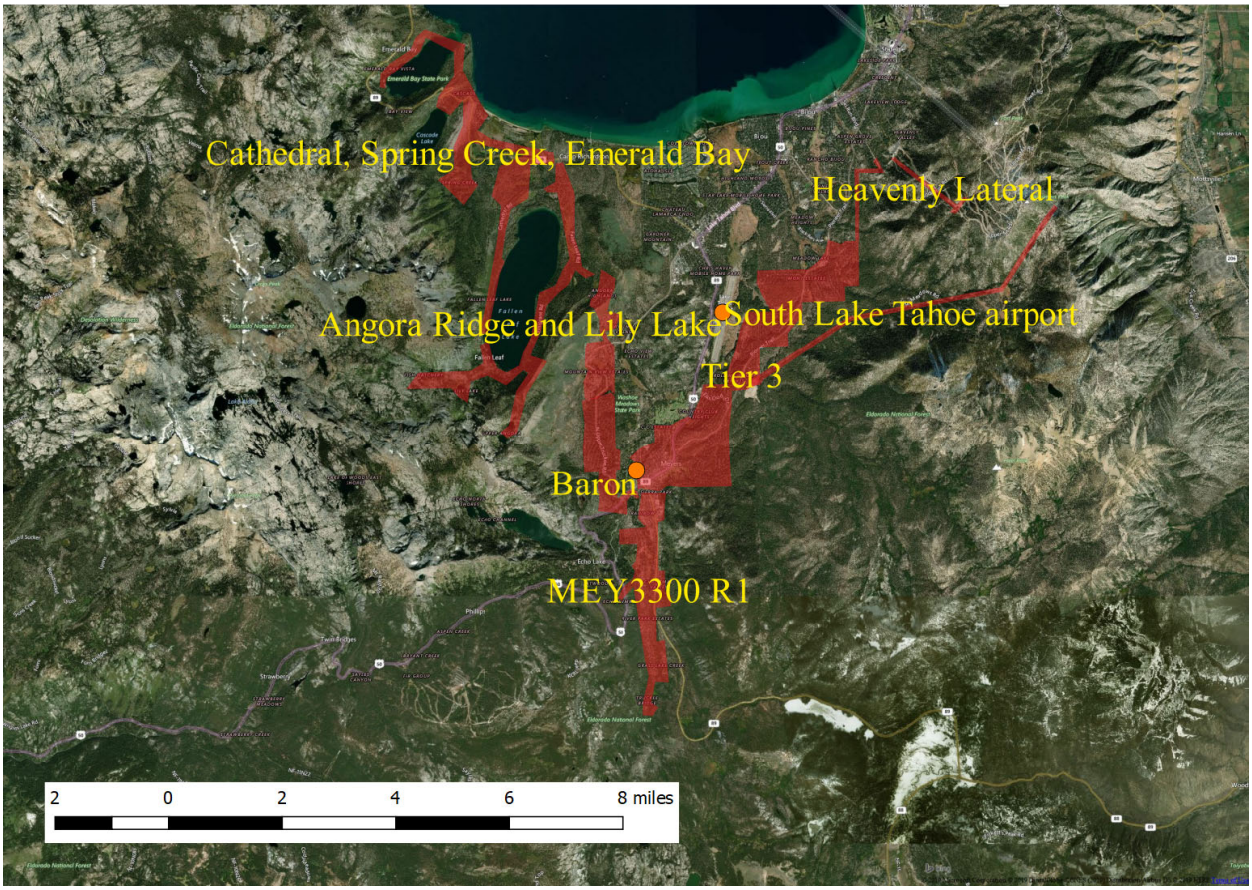


Figure 11. Locations of Liberty Utilities' South shore PSPS zones relative to Meyers/Baron RAWS and SLT airport weather station.

Scatter plots of wind gust against Fosberg Fire Weather Index are given in Figure 12 for Meyers/Baron RAWS and Figure 13 for South Lake Tahoe airport. In the 8 year period of record at Meyers/Baron RAWS, no exceedances occurred.

In the 21-year period of record at South Lake Tahoe airport, there were 410 observations where FFWI and wind gust exceeded baseline thresholds. However, this includes "off-season" winds where ERC would not be above 92nd percentile. After filtering these observations for "summer" months (June, July, August, and September), there were 15 separate days where one or more observation exceeded de-energization thresholds.

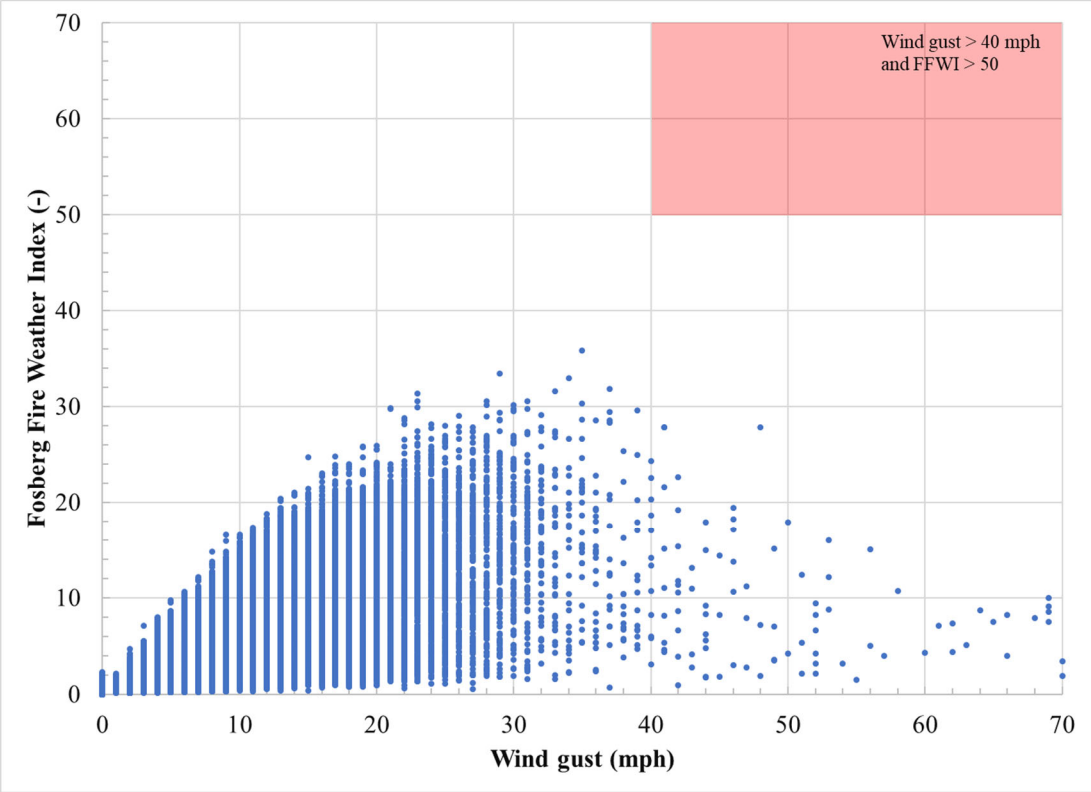


Figure 12. Baron RAWS wind gust vs. FFWI (2011 – 2018).

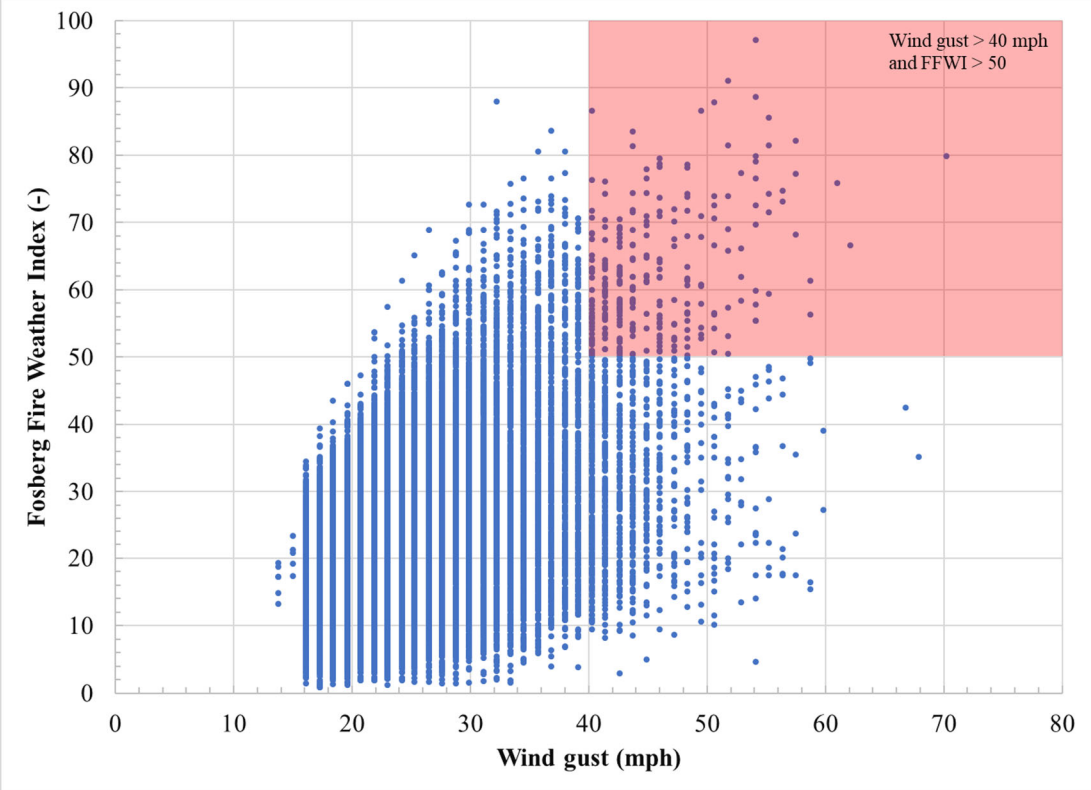


Figure 13. South Lake Tahoe airport wind gust vs. FFWI (1997 – 2018).

4.1.3 Truckee, Glenshire, and Hobart Mills

Liberty Utilities' Truckee/Glenshire/Hobart Mills PSPS Zones are shown in Figure 14. To provide an estimate of the historical frequency at which the proposed de-energization thresholds have been exceeded, energy release component and wind speed / Fosberg Fire Weather Index statistics are analyzed separately below.

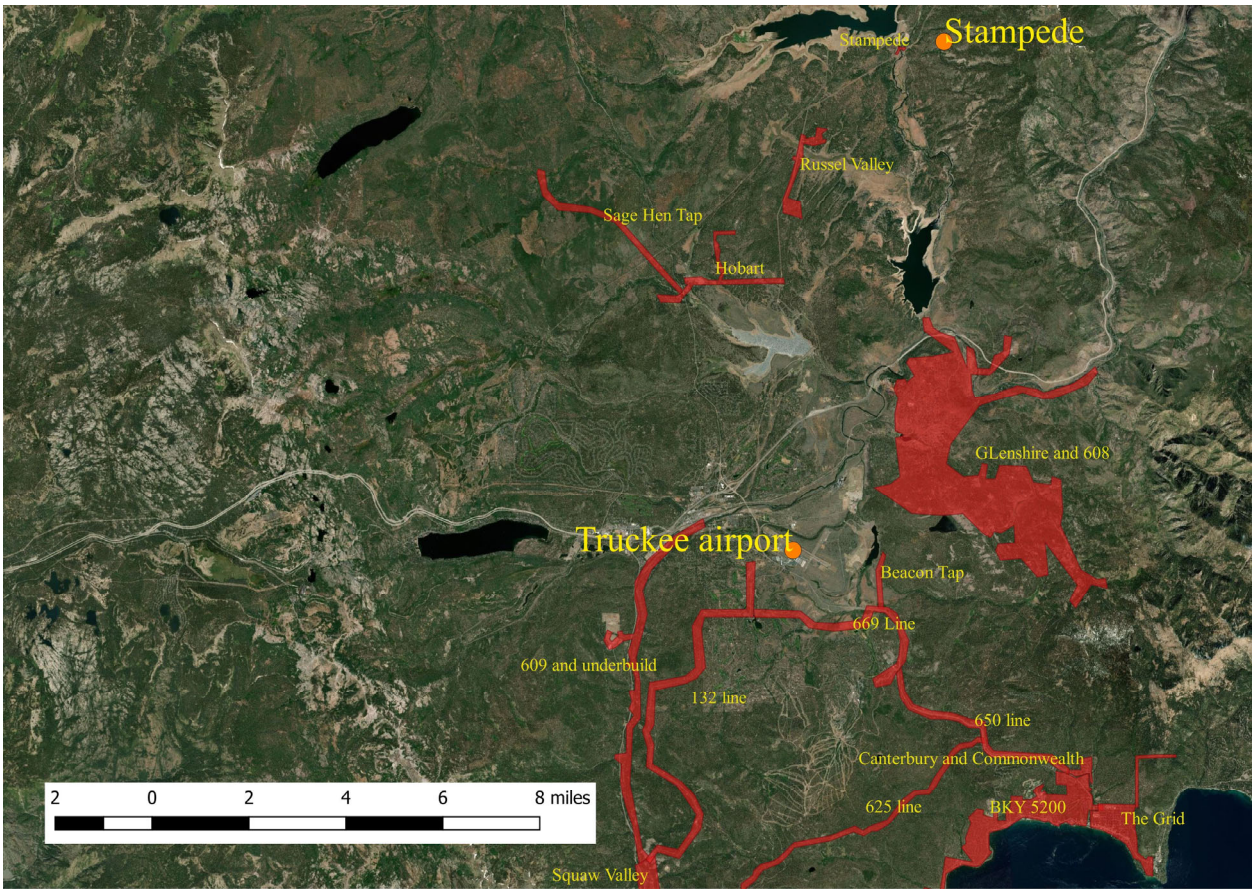


Figure 14. Truckee/Glenshire/Hobart Mills PSPS Zones and location of Stampede weather station.

Thirteen years (2006 – 2018) of observations from Stampede RAWS were processed to analyze seasonal variations in ERC (using NFDRS Fuel Model G), and the result is plotted in Figure 15. The maximum historical ERC exceeded the 92nd percentile threshold from early June through late September, but as with the Lake Tahoe SIG the 92nd percentile was not exceeded in the average year.

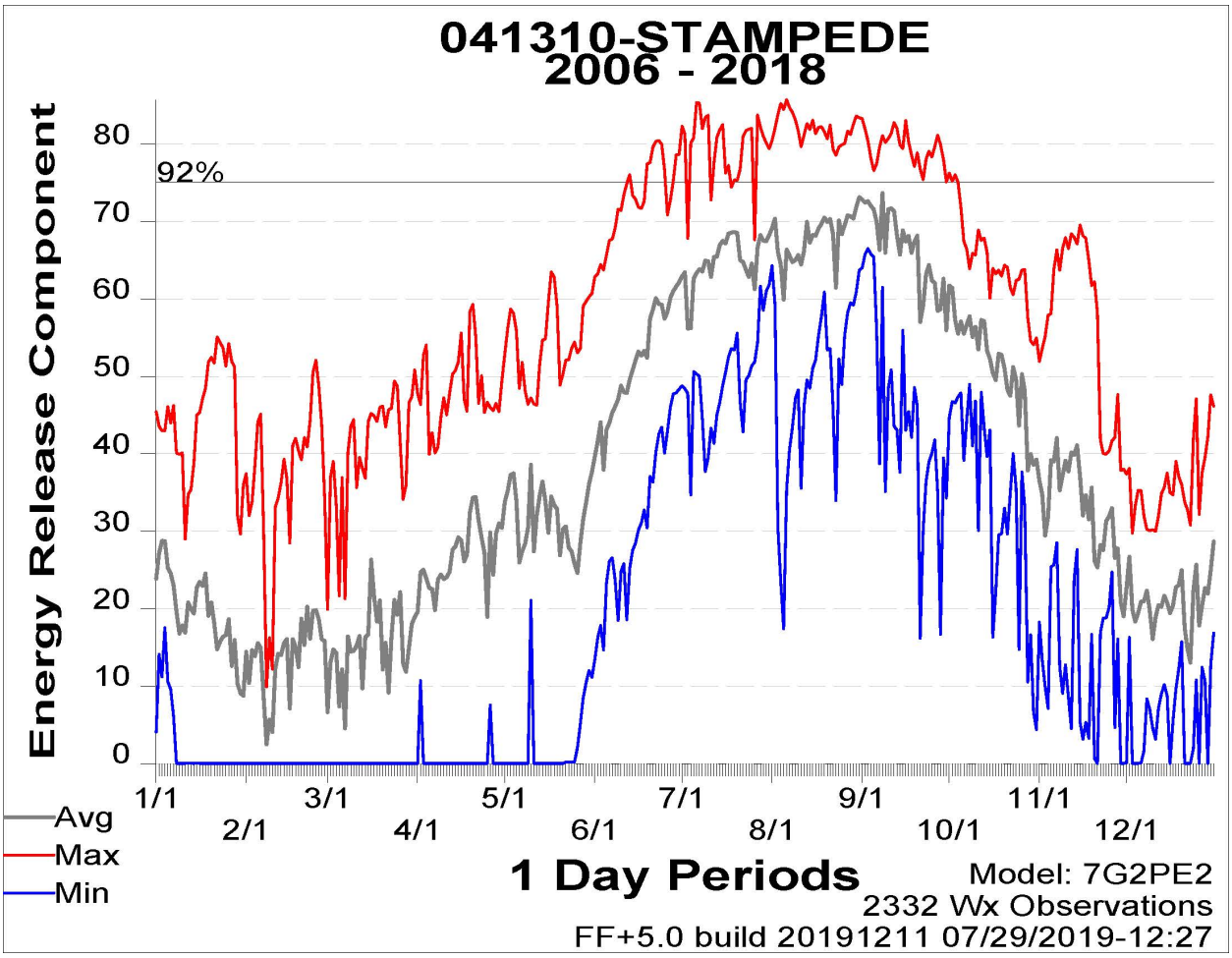


Figure 15. Seasonal variations in ERC (Fuel Model G) at Stampede RAWS.

Measured wind gust speed plotted against Fosberg Fire Weather index for Stampede RAWS from 1999 to 2018 is shown in Figure 16. The wind gust / FFWI threshold exceedances are presented in Table 4. ERC values are not available prior to 2006 so no ERC values are available for the 2004, 2005, or 2006 exceedances and ERC data are missing for 2010, so no ERC values are available for the exceedances shown in Table 4. However, since these exceedances occurred in June, it is possible that ERC values exceeded the 92nd percentile. In an average year the 92nd percentile ERC would not have been exceeded. The dates and duration of the three exceedance events is summarized below:

1. June 17, 2005: 8 hourly records
2. June 16, 2010: 2 hourly records

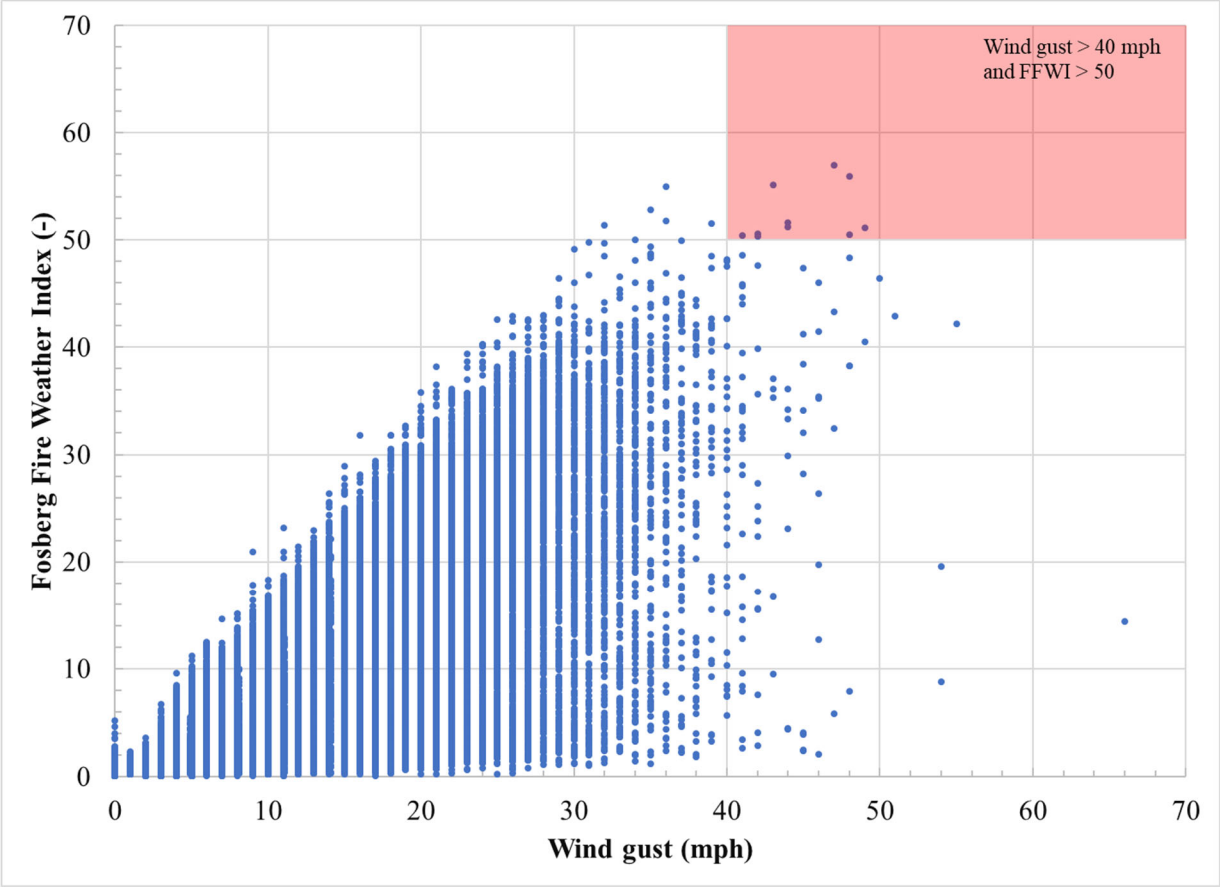


Figure 16. Stampede (SMDC1) wind gust vs. FFWI (1999 – 2018).

Table 4. Weather observations from Stampede RAWS where wind gust and FFWI de-energization thresholds were exceeded.

Station	Date PST / PDT	T F	RH %	WS mph	WG mph	FFWI -	ERC
SMDC1	2005-06-17_12:15	58	36	25	57	50	-
SMDC1	2005-06-17_14:15	58	31	25	48	53	-
SMDC1	2005-06-17_15:15	63	12	21	47	56	-
SMDC1	2005-06-17_16:15	61	13	22	50	58	-
SMDC1	2005-06-17_17:15	64	11	19	50	51	-
SMDC1	2005-06-17_19:15	66	11	19	43	52	-
SMDC1	2005-06-17_20:15	65	17	20	43	51	-
SMDC1	2005-06-17_23:15	63	16	20	41	51	-
SMDC1	2010-06-16_11:16	57	18	21	47	52	-
SMDC1	2010-06-16_18:16	65	11	20	42	54	-

Additional data from Truckee airport was also analyzed (Figure 17). The available period of record is 21 years. During this time, there were 225 observations that exceeded de-energization thresholds. However, most of these were off-season. After constraining these observations to

"summer" months (June, July, August, and September) when ERC may have exceeded 92%, 10 days were identified where one or more observation exceeded de-energization thresholds.

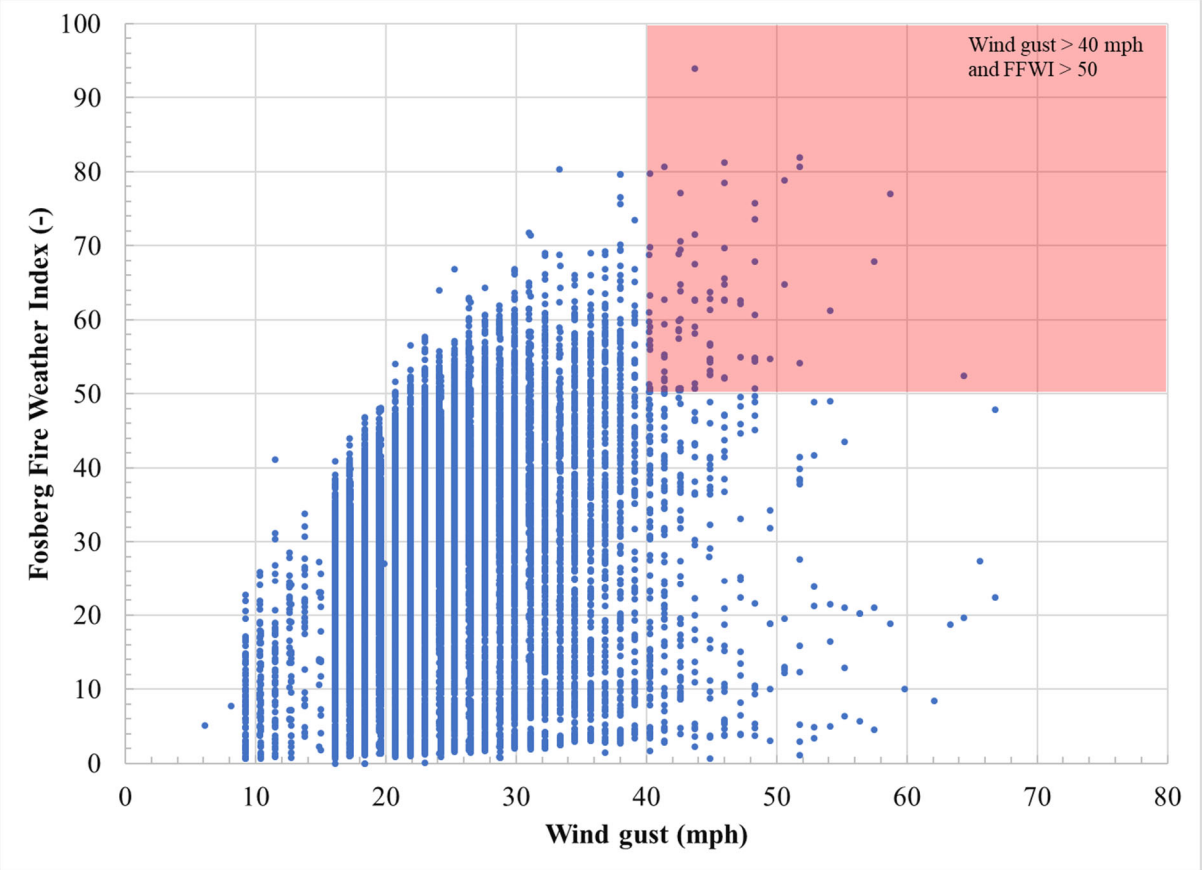


Figure 17. Truckee airport (KTRK) wind gust vs. FFWI (1997 – 2018).

4.1.4 Portola and Sierra Brooks

The Portola and Sierra Brooks PSPS zones are shown in Figure 18. There is one weather station in the surrounding area with a period of record that enables analysis of historical exceedance frequencies.

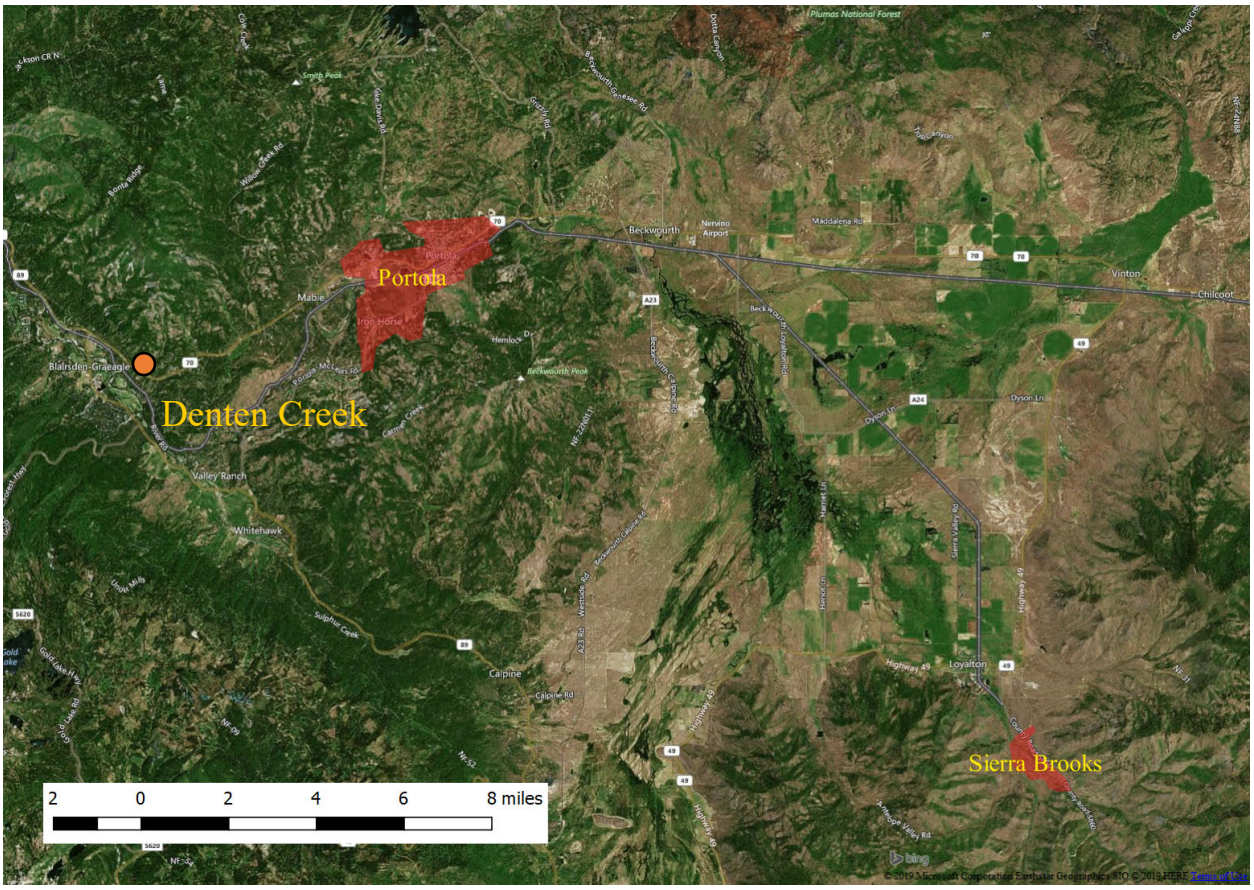


Figure 18. Portola and Sierra Brooks PSPS Zones and location of nearby weather stations.

Four years (2014-2018) of observations from Denten Creek RAWS were processed to analyze seasonal variations in ERC. This ERC analysis was completed using NFDRS Fuel Model G. The result is plotted in Figure 19. The maximum historical ERC exceeded the 92nd percentile threshold intermittently from approximately early July through late September. As with previous station analyses, the 92nd percentile was not exceeded in the average year.

Measured wind gust speed plotted against Fosberg Fire Weather Index for Denten Creek RAWS from 2014 to 2018 is shown in Figure 20. For the available period of record, FFWI and wind gust thresholds have not been exceeded.

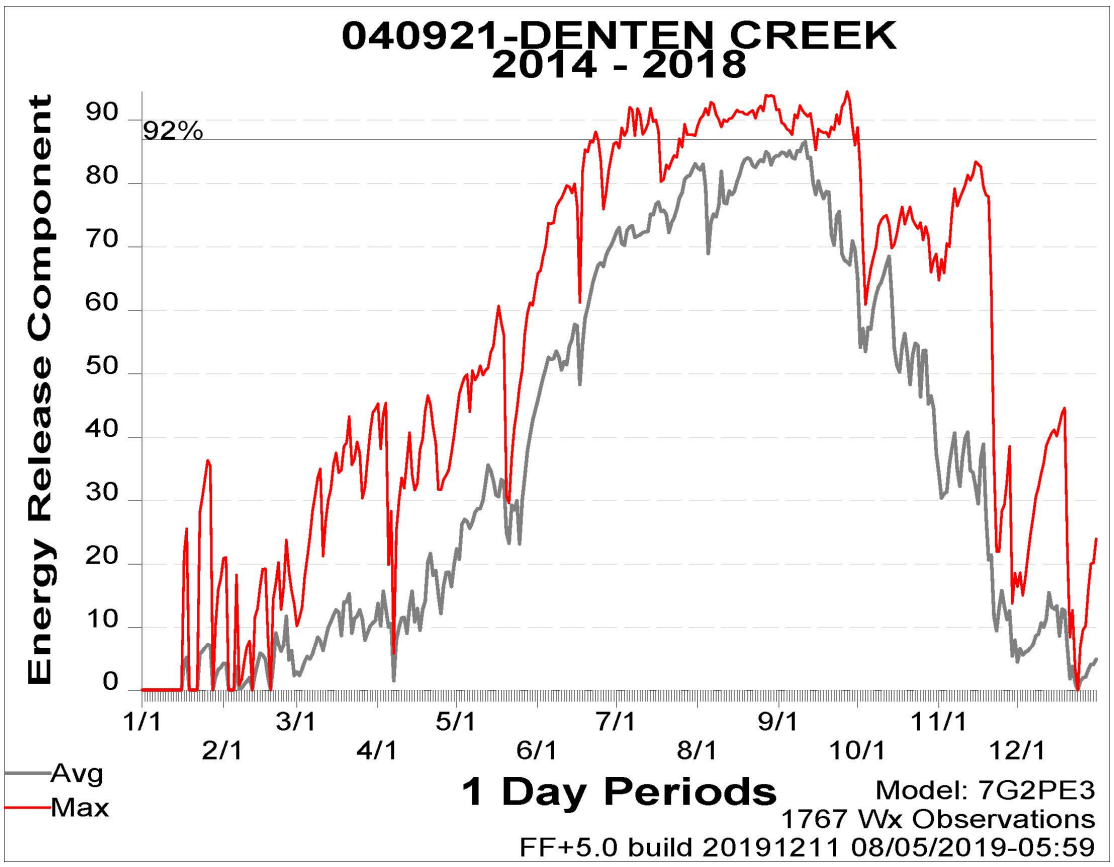


Figure 19. Seasonal variations in ERC (Fuel Model G) from Denten Creek RAWS.

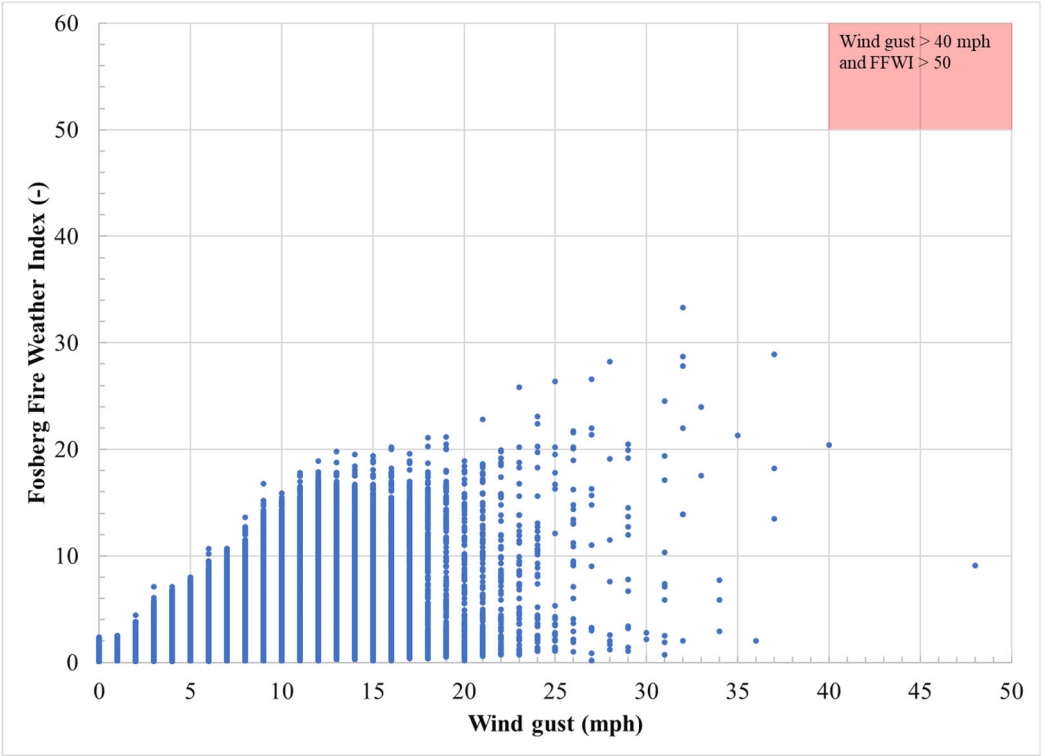


Figure 20. Denten Creek RAWS (MWKC1) wind gust vs. FFWI (2014 – 2018).

4.1.5 Topaz & Markleeville

The Topaz & Markleeville PSPS zones are shown in Figure 20. There are two weather stations, Markleeville and Walker RAWS, with a sufficiently long period of record in this area to analyze historical exceedance frequencies. Liberty Utilities has installed two weather stations in this area (LIB03 and LIB05), but these are relatively new stations with a short period of record.

Seasonal variations in ERC (for fuel model G) at Markleeville RAWS are shown in Figure 22. ERC has exceeded the 92nd percentile from approximately early June through late October. Measured wind gust speed plotted against Fosberg Fire Weather Index is shown in Figure 23. One threshold exceedance occurred in December 2002 when ERC would not have been above 92nd percentile.

Seasonal variations in ERC (for fuel model G) at Walker RAWS from 1975-2018 are shown in and Figure 24. The 92nd percentile ERC threshold has been exceeded from mid-June through mid-October. Figure 25 plots wind gust against Fosberg Fire Weather Index. Data quality from this station is questionable. Approximately 500 hourly records were identified wherein wind gust and FFWI thresholds were exceeded between June and October. Additional analysis is required to understand if these readings are affected by data quality and whether Walker RAWS is representative of conditions in the Topaz PSPS Zone.

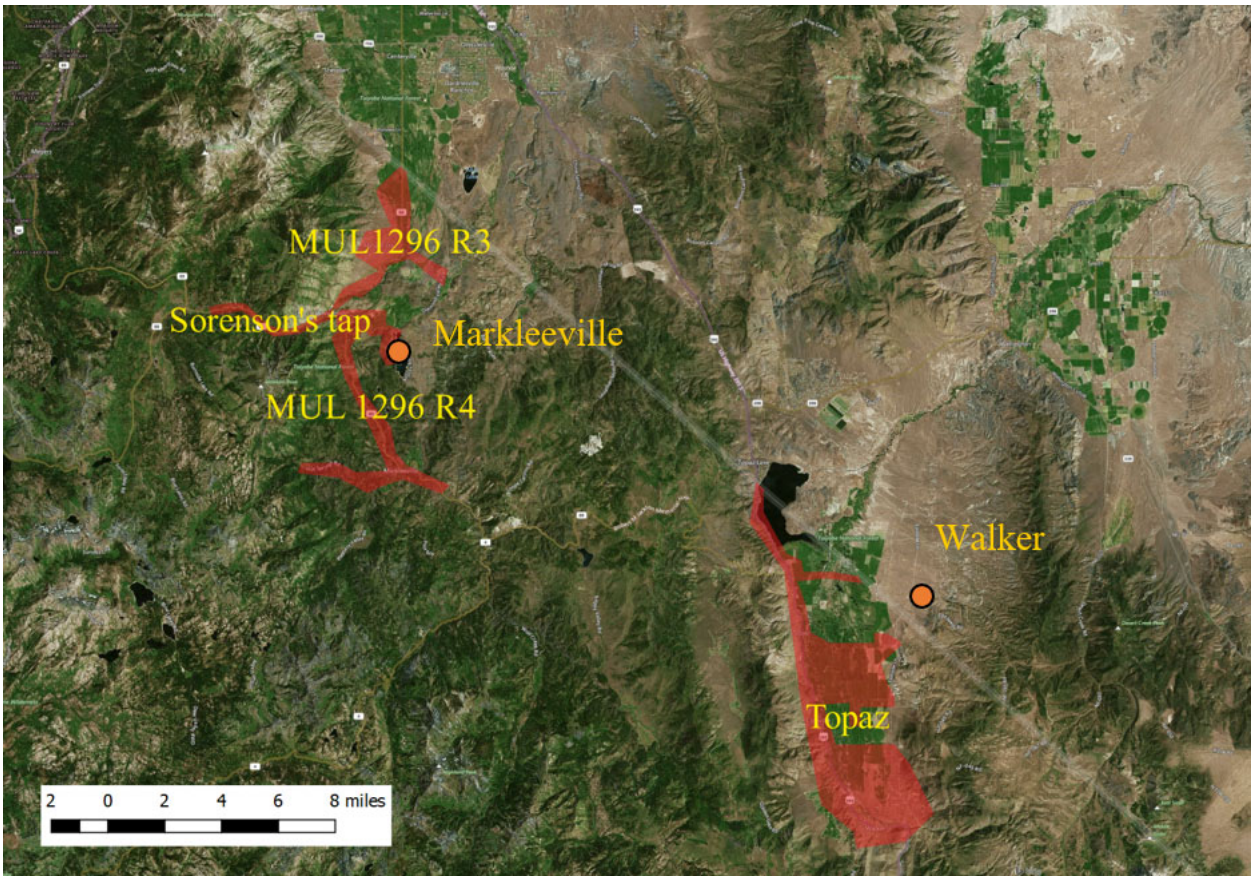


Figure 21. Liberty Utilities' PSPS Zones in Topaz / Markleeville.

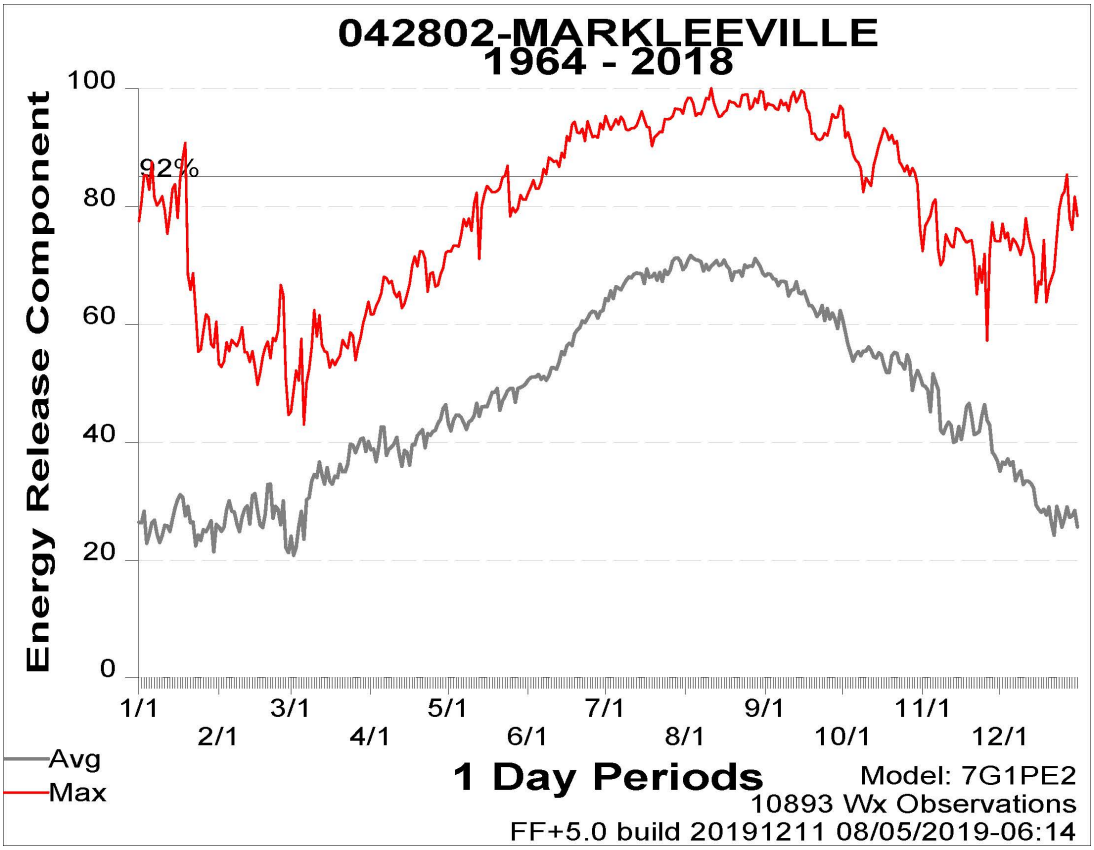


Figure 22. Seasonal Variations in ERC (Fuel Model G) from Markleeville RAWS

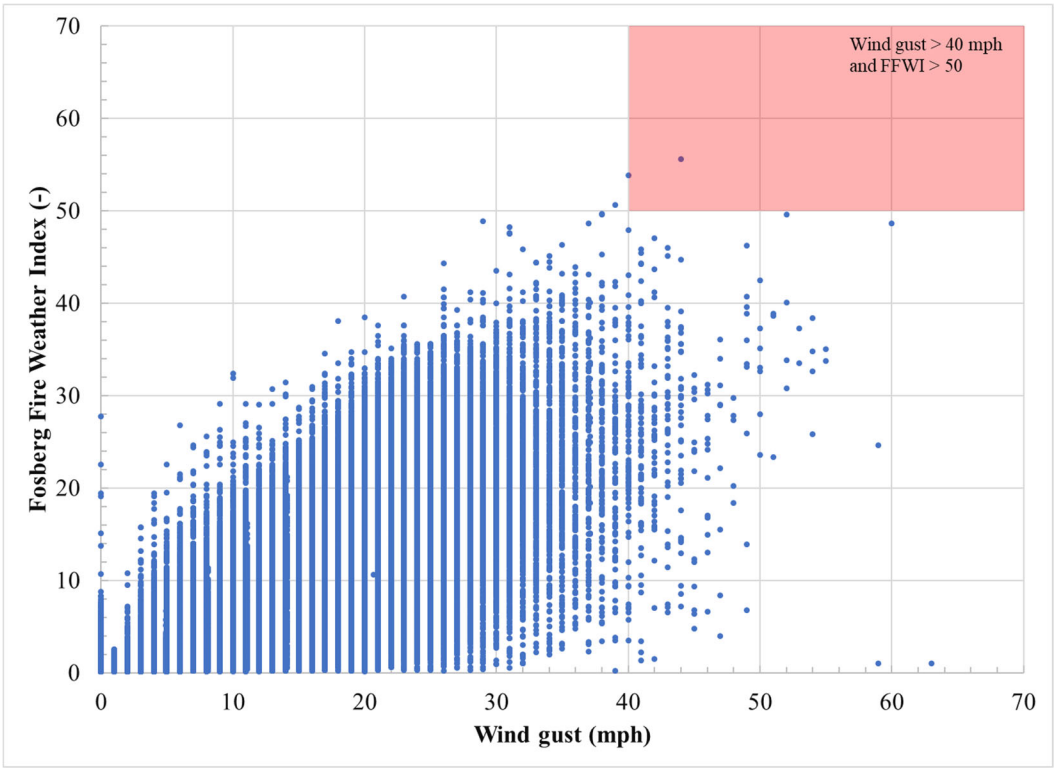


Figure 23. Markleeville RAWS (MKEC1) wind gust vs. FFWI (1999 – 2018).

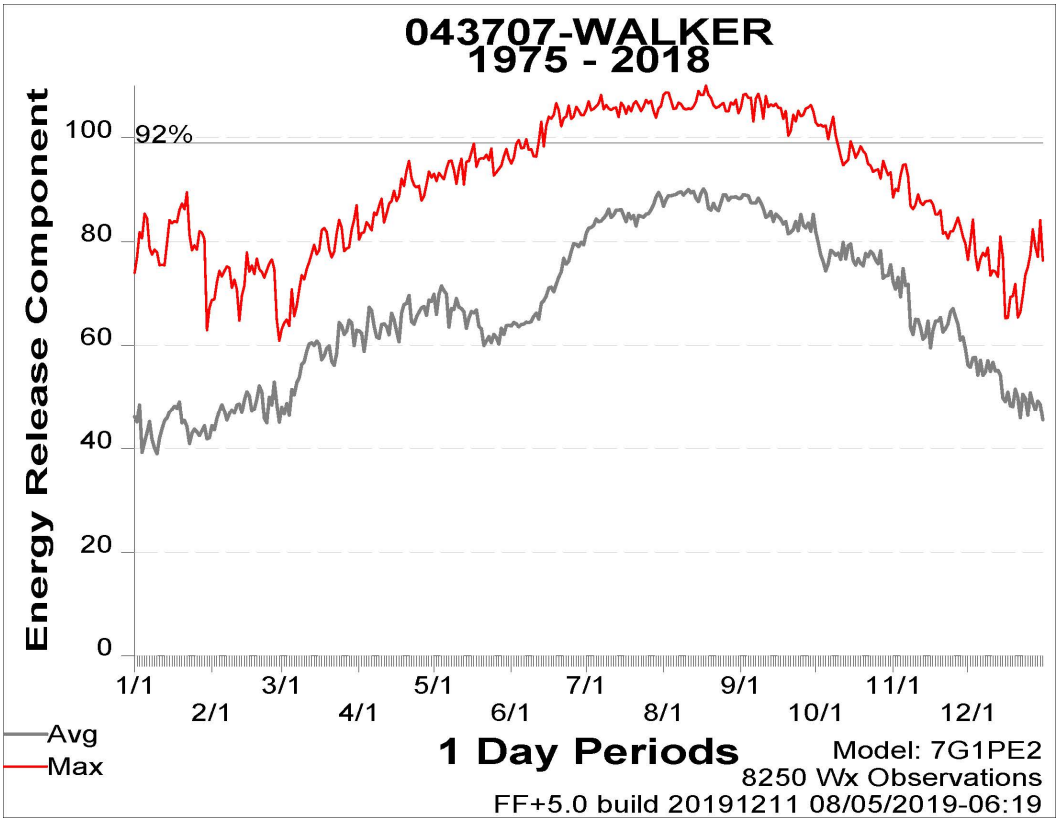


Figure 24. Seasonal variation in ERC (Fuel Model G) from Walker RAWS

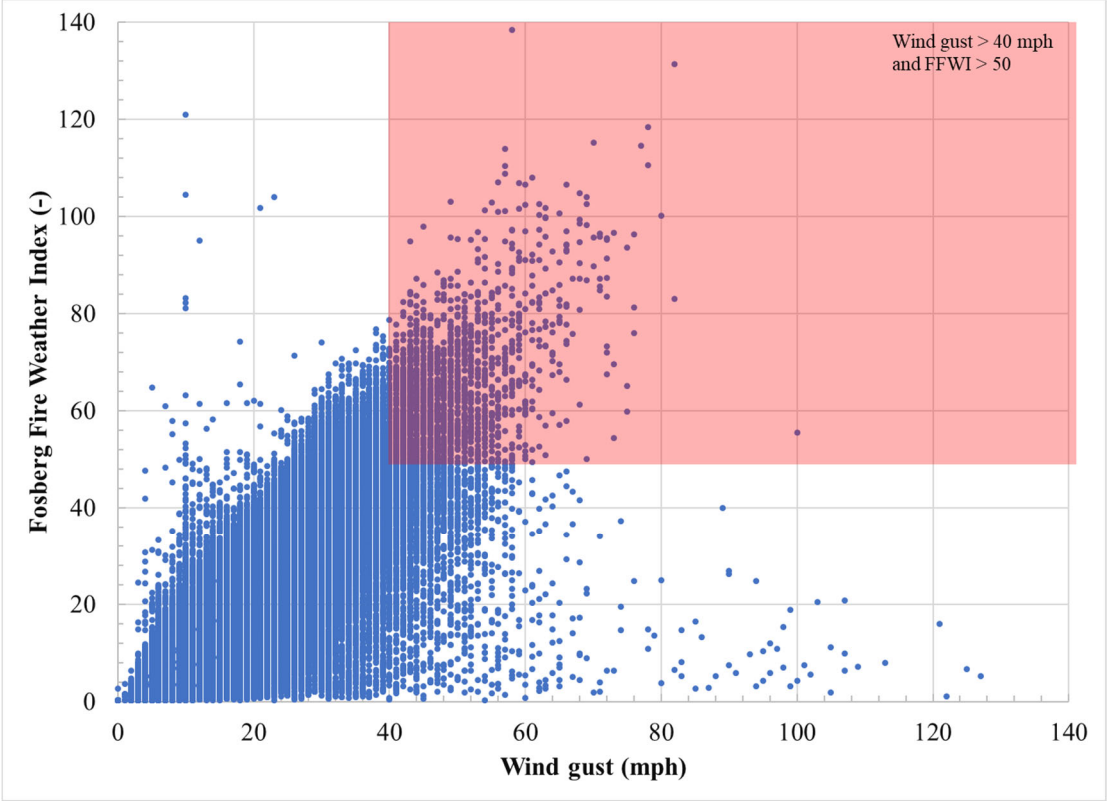


Figure 25. Walker RAWS (WALC1) wind gust vs. FFWI (1999 – 2018).

4.2 Archived weather forecast data

Operationally, times where weather conditions may exceed de-energization thresholds are identified by analyzing wind gust and FFWI forecasts from four different weather forecast models having different spatial/temporal resolutions and forecast durations:

a. 0-36 hours: High Resolution Rapid Refresh (HRRR) weather model. Spatial resolution is 3 km, temporal resolution is 1 hour, and forecast duration is 36 hours.
b. 37-60 hours: North American Mesoscale Model (NAM) high resolution CONUS nest. Spatial resolution is 3 km and temporal resolution is 1 hour.
c. 61-84 hours: After 60 hours, the NAM's spatial resolution decreases to 12 km. Temporal resolution is 3 hours.
d. 87-192 hours: After 84 hours, data from the Global Forecast System (GFS) is used. Spatial resolution is 0.25° (approximately 27 km), temporal resolution is 3 hours.

De-energization decisions would be made based on the "closest in" forecast (HRRR, which provides almost 34 hours of lead time). However, experience has shown that HRRR tends to over-estimate wind speed and FFWI in some of Liberty Utilities' PSPS zones when compared to weather station observations. A typical example is shown in Figure 26 where the 6/26/19 12z HRRR wind gust forecast is compared to measurements at Knox 2 RAWS in Incline Village. The wind speed forecast for 03:00 UTC on 6/27 was approximately 33 mph whereas the observed wind speed was approximately 50% of the forecast wind speed.

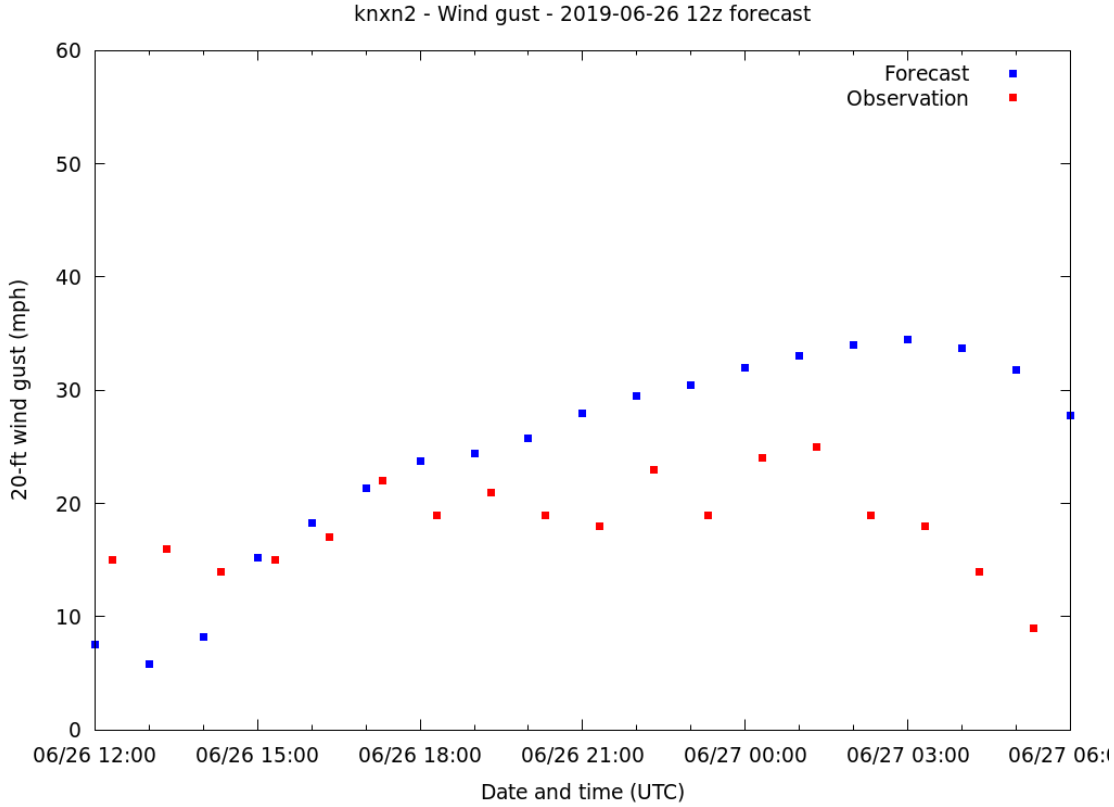


Figure 26. HRRR wind gust forecast compared with observations.

Three years of archived HRRR forecast data were analyzed to determine how frequently de-energization thresholds were forecast to be exceeded. The available period of record is July 15, 2016 through current.

Table 5 shows wind gust and FFWI thresholds by PSPS zone as well as the average number of hours per year that these screening criteria were forecast to be exceeded in the 3 years of available HRRR forecast data. These exceedance frequencies were tabulated for 80%, 90%, and 100% of the de-energization thresholds. De-energization thresholds are the same in all PSPS zones, except "Topaz" and "Mul 1296 r4", which have been assigned de-energization thresholds higher than the baseline values established earlier due to consistently higher wind speeds in these areas.

Table 5. Average number of de-energization threshold exceedances per year (independent of ERC) based on analysis of ~3 years of archived HRRR data.

PSPS zone	FFWI threshold (-)	Wind gust threshold (mph)	80%	90%	100%
111_line	50	40	2.4	0.0	0.0
132_line	50	40	0.0	0.0	0.0
609_and_underbuild	50	40	0.0	0.0	0.0
625_line	50	40	0.0	0.0	0.0
629_line	50	40	0.0	0.0	0.0
640_tier_2	50	40	0.0	0.0	0.0
650_line	50	40	0.0	0.0	0.0
alpine_backside	50	40	0.0	0.0	0.0
alpine_meadows_and_629	50	40	0.0	0.0	0.0
angora_ridge_and_lily_lake	50	40	0.0	0.0	0.0
beacon_tap	50	40	0.0	0.0	0.0
bky_5100_to_nve	50	40	0.0	0.0	0.0
bky_5200	50	40	0.0	0.0	0.0
canterbury_and_commonwealth	50	40	0.0	0.0	0.0
cathedral_spring_creek_emerald_bay	50	40	0.0	0.0	0.0
fir_crags	50	40	0.0	0.0	0.0
glenshire_and_608	50	40	0.0	0.0	0.0
heavenly_lateral	50	40	0.0	0.0	0.0
hobart	50	40	0.0	0.0	0.0
mey_3400_angora_creek	50	40	0.0	0.0	0.0
mey3300_r1	50	40	0.0	0.0	0.0
mey3300_r3	50	40	0.0	0.0	0.0
mul_1296_r4	50	40	1.5	0.0	0.0
mul1296_r3	60	45	1.2	0.0	0.0
old_country_road	50	40	0.0	0.0	0.0
portola	50	40	0.0	0.0	0.0
russel_valley	50	40	0.0	0.0	0.0
sagehen_tap	50	40	0.0	0.0	0.0
sierra_brooks	50	40	0.0	0.0	0.0
sorensons_tap	50	40	0.0	0.0	0.0
squaw_valley	50	40	0.0	0.0	0.0
stampede	50	40	0.0	0.0	0.0
sunnyside	50	40	0.0	0.0	0.0
tah_52-68	50	40	0.0	0.0	0.0
tah_73-17	50	40	0.0	0.0	0.0
tah_73-36	50	40	0.0	0.0	0.0
tah_73-45	50	40	0.0	0.0	0.0
tah_73-60	50	40	0.0	0.0	0.0
tah_73-74	50	40	0.0	0.0	0.0
tah_7300_r1	50	40	0.0	0.0	0.0
tahoe_park_heights	50	40	0.0	0.0	0.0
the_grid	50	40	0.0	0.0	0.0
tier_3	50	40	0.0	0.0	0.0
topaz	60	45	2.1	0.9	0.0
ward_canyon_east	50	40	0.0	0.0	0.0
ward_canyon_west	50	40	0.0	0.0	0.0

5.0 Fire Weather Conditions associated with Fires of Historical Significance

As a check on the proposed de-energization thresholds, we have analyzed ERC and fire weather conditions associated with fires having historical significance (due to structure losses, near misses, or large fire acreage) in and around Liberty Utilities' PSPS zones.

5.1 Fires of historical significance

Five fires in the Greater Lake Tahoe region were identified as being of interest, with their locations relative to Liberty Utilities PSPS Zones shown in Figure 27:

1.) 1960 Donner Ridge Fire (43,000 acres, burned through parts of what is now Truckee's Tahoe Donner neighborhood)
2.) 2001 Martis Fire (consumed over 10,000 acres in one day)
3.) 2002 Gondola Fire (started at Heavenly Ski Area and was a "near hit" for structures along Kingsbury Grade)
4.) 2007 Angora Fire (Destroyed over 250 structures near South Lake Tahoe)
5.) 2016 Little Valley Fire (Escaped prescribed burn that destroyed 23 homes East of Lake Tahoe)

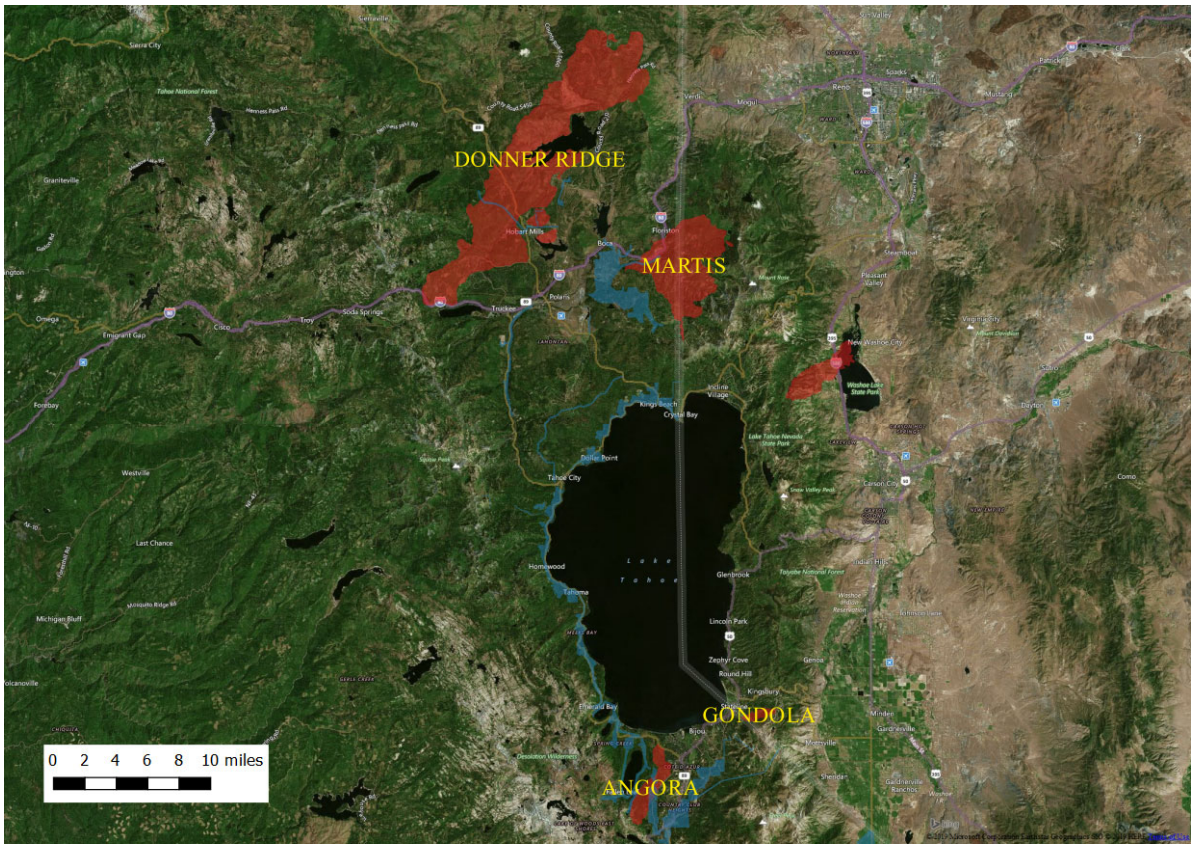


Figure 27. Greater Lake Tahoe region fires of historical significance.

5.2 Fire weather conditions

5.2.1 1960 Donner Ridge Fire

The Donner Ridge Fire began on August 25th, 1960. Although no weather station observations are available from conventional sources, it has been reported that winds were in the 60-70 mph range [13], which would have simultaneously exceeded wind gust and FFWI de-energization thresholds.

5.2.2 2001 Martis Fire

The Martis Fire was ignited on June 16, 2001. It consumed over 10,000 acres in its first seven hours and ultimately destroyed a cabin, a mobile home, and 3 vehicles [14]. Conditions at lower elevations were such that the initial rate of spread was rapid, but fuel moistures at higher elevations reduced spread rates. No representative weather station observations are available due to missing or bad data from surrounding stations. Without representative meteorological observations it is inconclusive as to whether de-energization thresholds were exceeded but they most likely were not.

5.2.3 2002 Gondola Fire

The Gondola Fire was ignited around 12:30 PM on July 3, 2002 near the gondola at Heavenly Ski Resort. It ultimately consumed approximately 700 acres and threatened over 500 structures although no structures were destroyed. The fire initially grew relatively slowly, reaching 25 acres several hours after ignition. Observations from the nearby Cave Rock station (Table 6) show relatively mild fire weather conditions. Peak wind gust was 13 mph with FFWI of 8. This is not close to exceeding de-energization thresholds.

Table 6. Weather observations at Cave Rock on the afternoon of the Gondola Fire.

Date PDT	T F	RH %	WS mph	WG mph	FFWI -
2002-07-03_12:00	69.2	47	1.6	4.5	3.4
2002-07-03_12:15	70.4	24	1.8	3.8	4.8
2002-07-03_12:30	68.6	46	2.2	4.7	4.3
2002-07-03_12:45	68.6	47	1.6	3.8	3.4
2002-07-03_13:00	70.2	46	1.8	3.8	3.7
2002-07-03_13:15	68.8	48	2	4	3.9
2002-07-03_13:30	70.2	39	2.5	4.7	5.3
2002-07-03_13:45	71	32	2	3.6	4.8
2002-07-03_14:00	72.4	30	3.1	7.6	7.1
2002-07-03_14:15	73.3	28	3.6	9.6	8.4
2002-07-03_14:30	73.8	32	3.4	12.5	7.6
2002-07-03_14:45	74	36	2.7	7.2	5.9
2002-07-03_15:00	73.8	33	3.1	7.8	6.9
2002-07-03_15:15	73.8	35	2.7	7.6	6.0
2002-07-03_16:00	73.8	35	2.2	5.6	5.0
2002-07-03_16:15	74.7	32	2.7	5.1	6.2
2002-07-03_16:30	74.4	34	3.6	13	7.8
2002-07-03_17:00	75.1	35	3.4	10.1	7.3
2002-07-03_17:30	75.3	34	2.9	5.8	6.4
2002-07-03_17:45	74.5	38	3.1	11.4	6.5
2002-07-03_18:00	74	33	4.5	12.3	9.8
2002-07-03_18:15	74	31	3.6	8.3	8.1
2002-07-03_18:30	74	32	3.6	10.7	8.0

5.2.4 2007 Angora Fire

The 2007 Angora Fire destroyed over 250 structures near South Lake Tahoe. It was ignited at approximately 2 PM on June 24, 2007. Steady winds of 20-30 mph gusting to 50 mph were reported, but observations at local weather stations showed lower wind speeds.

Table 7 shows observations from the US-50 Kahle Drive station on the afternoon of the first day of the Angora Fire (when most structures were destroyed). The highest wind gust was approximately 29 mph which occurred when FFWI was approximately 26. Although measured wind gusts approached de-energization thresholds, FFWI did not. Given reports of steady winds up to 30 mph with gusts to 50 mph, if a denser network of weather stations was available at the time of the fire, it is likely that weather conditions at more representative stations closer to the fire exceeded de-energization thresholds.

Table 7. Observations at US-50 Kahle Dr. on the first day of the Angora Fire.

Date PDT	T F	RH %	WS mph	WG mph	FFWI -
2007-06-24_13:00	66.9	14	8.3	21	21.9
2007-06-24_13:15	67.5	13	9	19.7	24
2007-06-24_13:30	68.7	13	7.4	22.8	19.8
2007-06-24_14:00	67.6	14	9.8	28.9	25.9
2007-06-24_14:30	69.1	13	9	23.7	24.1
2007-06-24_14:45	68.5	14	9.4	20.6	24.8
2007-06-24_15:45	65.7	14	9.8	25.3	25.8
2007-06-24_16:15	64.6	18	9	24.4	22.6
2007-06-24_17:15	63.7	21	7.8	18.3	19
2007-06-24_17:30	63	25	6.9	19.5	16.1
2007-06-24_18:00	63	23	9.4	23.7	22.3
2007-06-24_19:00	62.1	28	4.7	11.9	10.7
2007-06-24_19:30	61	30	4.5	11	10
2007-06-24_20:00	59.5	31	5.1	11.9	11.1
2007-06-24_21:15	54.5	40	2.7	6	5.5
2007-06-24_21:30	53.2	42	2.2	7.8	4.5
2007-06-24_21:45	53.2	43	2	8.7	4.1
2007-06-24_22:00	51.6	45	1.6	4.7	3.4
2007-06-24_22:15	51.3	45	1.3	3.6	2.9
2007-06-24_22:30	48.7	49	1.8	3.8	3.5
2007-06-24_23:00	47.7	51	1.3	3.8	2.6

5.2.5 2016 Little Valley Fire

The October 2016 Little Valley Fire was a holdover fire from an earlier prescribed burn. It rekindled and escaped on October 14, 2016 at approximately 12:30 am, ultimately destroying 23 homes East of Lake Tahoe. Little Valley RAWS (see Table 8) reported a wind gust of 87 mph at 12:38 AM on October 14, 2016, although the veracity of this observation is questionable. Several wind gust readings that morning exceeded 50 mph. However, FFWI remained below 45 because temperatures were low (52 °F), relative humidities were moderate (30% - 50%), and sustained wind speeds did not exceed 20 mph.

In summary, observations at Little Valley RAWS showed wind gusts well in excess of de-energization thresholds. However, peak FFWI reached approximately 87% of the de-energization threshold due to low temperatures, relatively high humidities, and moderate sustained wind speeds. If a denser network of weather stations was available at the time of the fire, it is likely that weather conditions at more representative stations closer to the fire exceeded de-energization thresholds.

Table 8. Observations at Little Valley RAWS data on first day of the Little Valley Fire.

Date PDT	T F	RH %	WS mph	WG mph	FFWI -
2016-10-13_14:38	62	25	12	31	27.7
2016-10-13_15:38	57	26	16	45	36.2
2016-10-13_16:38	57	31	16	39	34.1
2016-10-13_17:38	55	37	16	36	31.7
2016-10-13_18:38	53	39	16	35	30.8
2016-10-13_19:38	52	42	15	30	27.8
2016-10-13_20:38	51	38	14	33	27.3
2016-10-13_21:38	52	32	15	45	31.4
2016-10-13_22:38	52	32	13	44	27.3
2016-10-13_23:38	52	29	20	54	43.4
2016-10-14_00:38	52	32	16	87	33.5
2016-10-14_01:38	52	35	19	56	38.4
2016-10-14_02:38	51	38	15	55	29.2
2016-10-14_03:38	51	42	13	48	24.1
2016-10-14_04:38	51	44	9	39	16.3
2016-10-14_05:38	50	49	12	37	20.4
2016-10-14_06:38	49	53	9	35	14.3
2016-10-14_07:38	47	60	18	47	26.4
2016-10-14_08:38	49	55	16	52	24.9
2016-10-14_09:38	50	57	9	41	13.8
2016-10-14_10:38	46	71	8	33	9.5
2016-10-14_11:38	46	77	7	32	6.9
2016-10-14_12:38	44	84	9	33	6.7
2016-10-14_13:38	43	80	14	38	12.3

6.0 PSPS ZONE-SPECIFIC DE-ENERGIZATION THRESHOLDS AND DECISION TREES

6.1 Topaz and Mul 1296 r3 PSPS Zones

Based on the preceding discussion and analyses, the recommended protocol for de-energization in the Topaz and Mul 1296 r3 PSPS zones involves simultaneously testing whether the following criteria are exceeded:

1. Observed Energy Release Component (ERC) > 92nd percentile
2. Observed wind gust > 45 mph
3. Observed Fosberg Fire Weather Index (FFWI) > 60

This is presented as a decision tree in Figure 28:

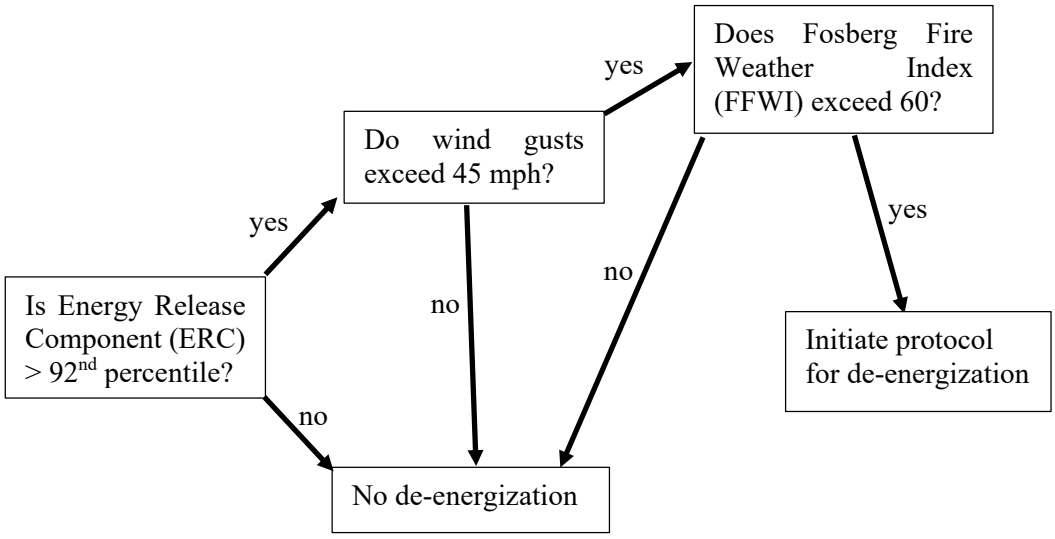


Figure 28. De-energization decision tree for Topaz and Mul 1296 r3 PSPS zones.

6.2 All PSPS zones except Topaz and Mul 1296 r3

Based on the preceding discussion and analyses, the recommended protocol for de-energization in the PSPS zones except Topaz and Mul 1296 r3 PSPS involves simultaneously testing whether the following criteria are exceeded:

1. Observed Energy Release Component (ERC) > 92nd percentile
2. Observed wind gust > 40 mph
3. Observed Fosberg Fire Weather Index (FFWI) > 50

This is presented as a decision tree in Figure 29:

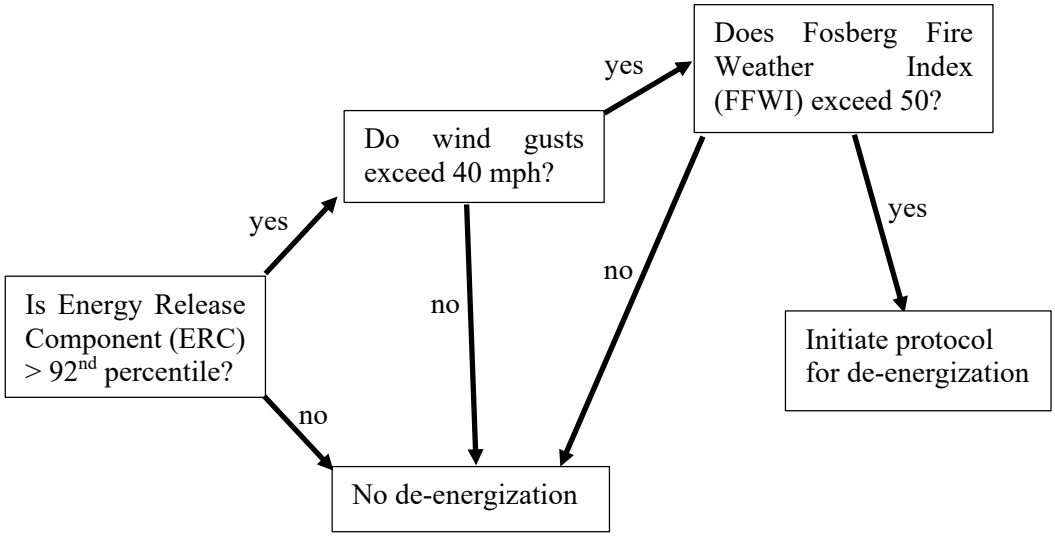


Figure 29. De-energization decision tree for PSPS zones except Topaz and Mul 1296 r3.

7.0 SUMMARY AND CONCLUDING REMARKS

This report recommends de-energization thresholds based primarily on fire weather considerations within PSPS zones that have been designated by others. This inherently assumes that each PSPS Zone presents equal risk from utility-associated fires to structures, people, and improved property. Factors such as Firewise practices (defensible space, construction techniques, etc.), ingress/egress, first responder response time and capabilities, wind direction relative to assets at risk, *etc*. were not considered here when establishing these de-energization thresholds. Empirically, vegetation failures are more likely to occur under countervailing winds (meaning winds from a direction dissimilar to the predominant wind decision).

Operationally, the forecast-based screening criteria described in Section 4.1.1 are used to screen for times in the future at which weather conditions may exceed de-energization thresholds. The weather analytics system used by Liberty Utilities provides notification when conditions are forecast to exceed 80%, 90%, and 100% of the screening criteria in each PSPS zone. If ERC exceeds 92nd percentile and these forecast-based screening criteria are forecast to be exceeded, then weather station observations are monitored in real time to assess whether forecasted conditions materialize and observed fire weather conditions are trending toward de-energization thresholds. The decision to de-energize is ultimately made manually upon consideration of weather station observations and data from field observers.

8.0 REFERENCES

[1] Mitchell, J.W., "Power line failures and catastrophic wildfires under extreme weather conditions," *Engineering Failure Analysis* **35**: 726–735 (2013).

[2] Mitchell, J.W., "Power Lines and Catastrophic Wildland Fire in Southern California," Fire and Materials 2009.

[3] https://www.firelab.org/project/firefamilyplus

[4] https://www.wfas.net/index.php/keetch-byram-index-moisture--drought-49

[5] Riley, K.L., Abatzoglou, J.T., Grenfell, I.C., Klene, A.E., and Heinsch, F.A., "The relationship of large fire occurrence with drought and fire danger indices in the western USA, 1984–2008: the role of temporal scale," *International Journal of Wildland Fire* **22**: 894–909 (2013).

[6] https://www.wfas.net/images/firedanger/fdr_obs.txt

[7] https://www.wfas.net/images/firedanger/fdr_fcst.txt

[8] https://wfas.net

[9] Durst, C.S., "Wind Speed Over Short Periods of Time," *Meteorological Magazine* **89**: 181-187 (1960).

[10] Fosberg, M.A, "Weather in Wildland Fire Management: The Fire Weather Index," *Conference on Sierra Nevada Meteorology*, American Meteorological Society, pp 1-4 (1978).

[11] Taylor, S.J., Bright, R., Carbin, G., Bothwell, P., and Naden, R., "Using short range ensemble model data in national fire weather outlooks," *Fifth Symposium on Fire and Forest Meteorology* (2003).

[12] https://gacc.nifc.gov/gbcc/predictive/docs/WGBEOY/EOY13.pdf

[13] https://www.tahoedailytribune.com/news/50-years-later-truckees-biggest-fire/

[14] https://www.sierrasun.com/news/martis-fire-remembered/

APPENDIX A – FUEL MOISTURE SAMPLING PLAN

Field sampling of wildland fuels will be conducted in specific areas to quantify current fuel moisture conditions. These data provide insight into potential fire behavior and facilitate calculation of National Fire Danger Rating System (NFDRS) indices – specifically Energy Release Component (ERC) – based on actual field observations. This sampling also elucidates whether automated ERC values calculated from weather station observations and disseminated via the Wildland Fire Assessment System (WFAS) comport with field conditions.

Personnel

During the 2019 "fire season," field sampling will be conducted by Reax Engineering (Chris Lautenberger, Delaney Seeburger, J. Ronnie Thomas) and Spatial Informatics Group (Shane Romsos, Gary Roller, and Jarrett Barbuto).

Timeline and sampling frequency

Fuel moistures are commonly sampled bi-weekly. Therefore, a sampling interval of approximately 10 – 14 days will be implemented. This interval will be reassessed after initial measurements are obtained. Sampling will also be conducted after significant rain events.

Fuels to be sampled

ERC for fuel model G is extremely sensitive to 1000-hour fuel moisture so 1000-hour fuels will be sampled. Although ERC(G) is insensitive to live fuel moistures (due to lower live fuel loadings) live fuels will be sampled at each site because this provides additional insight into potential fire behavior. In Greater Lake Tahoe, Greenleaf Manzanita and Snowbrush Ceanothus will be targeted with Sagebrush at sites that do not have Manzanita or Snowbrush.

Sampling locations

Fuel moisture samples will be collected from the following locations in Greater Lake Tahoe (See Figure A-1):

1. Alder Creek (NV Energy Truckee PDZ)
2. Knox 2 RAWS (NV Energy Incline PDZ)
3. Spooner Summit (NV Energy Glenbrook PDZ)
4. Kingsbury / Tahoe Rim Trail North (NV Energy Roundhill PDZ)
5. Meyers / Baron RAWS (Liberty Utilities south shore PSPS zones)
6. Ward Creek (Liberty Utilities west & north shore PSPS zones)
7. Burton Creek State Park (Liberty Utilities west & north shore PSPS zones)

Sampling protocol

To the extent possible, sampling will follow recommendations in the US Forest Service fuel moisture collection and equipment guide[1].

Drying, reporting, and calculations

Samples will be weighed in the field, dried in a lab oven at 100 °C for 24-hours, and then weighed again to facilitate calculate of moisture content. The resulting moisture content values will then be used to calculate ERC using Fuel Model G. Since this gives values with units of Btu/ft^2, a Fire Family Plus climatology analysis of the nearest NFDRS weather station will be used to convert ERC values in Btu/ft^2 to percentiles.

[1] Zahn, S. and Henson, C., "A Synthesis of Fuel Moisture Collection Methods and Equipment – A Desk Guide," US Department of Agriculture Forest Service, National Technology & Development Program, May 2011.

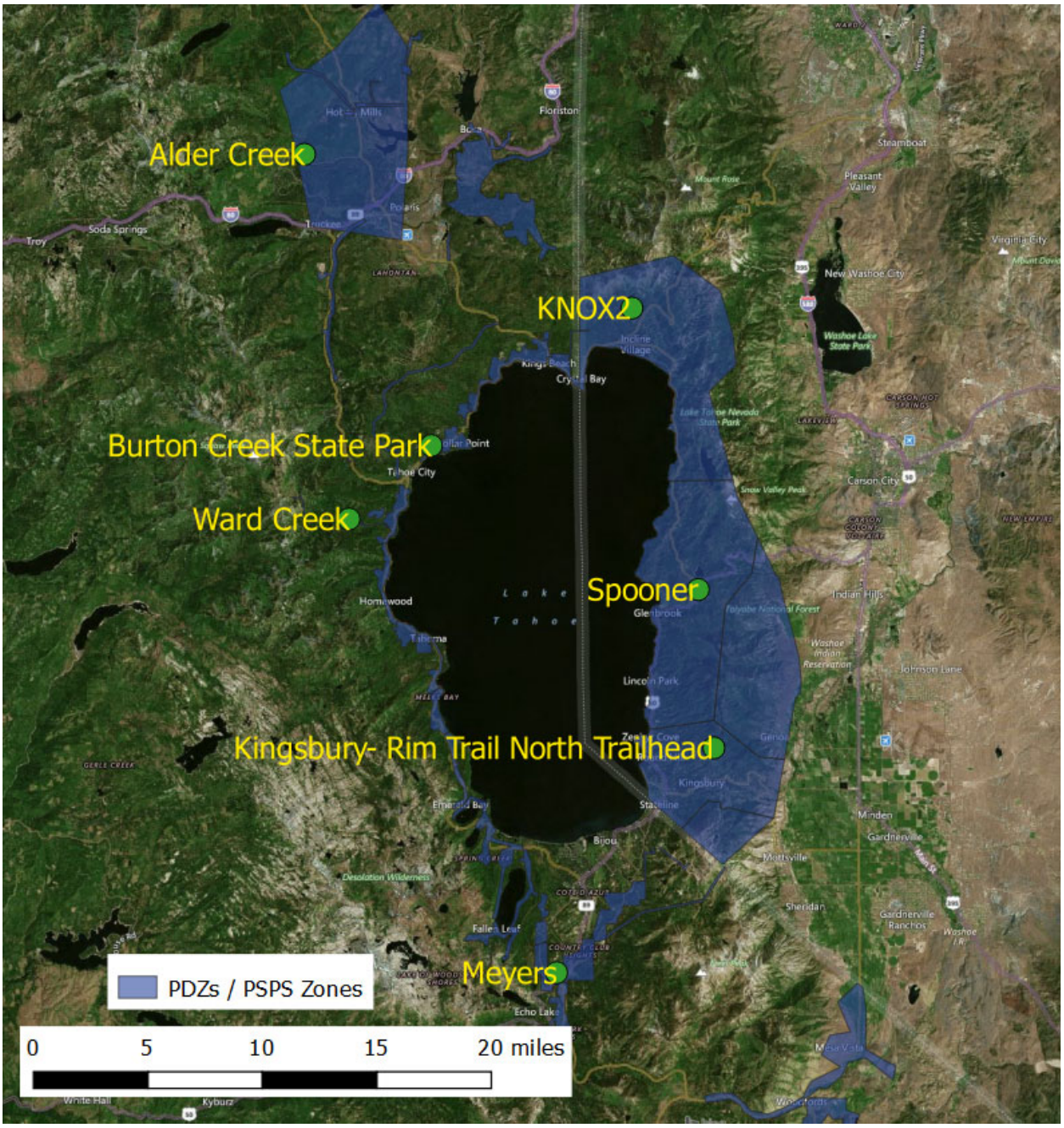


Figure A-1. Fuel moisture sampling locations in Greater Lake Tahoe area.

PSPS Communications Playbook

Last Updated 06/13/2022

Table of Contents

Record of Change

Date	Location of Change	Description of Change	Change Made By	Change Approved By

Record of Distribution

Date	Organization/Agency/Juris-diction	POC Email

Plan Overview

Plan Organization

The Liberty Public Safety Power Shutoff (PSPS) Playbook is divided into four major sections.

- **Event Communications** – This section includes the steps to take within each stage (as determined by the CPUC and Cal OES) of a PSPS event and what to do when power is restored to impacted areas. Additional direction is included for NV Energy-related PSOM events.

CAL OES PSPS STAGES	
STAGE 1 (72 HOURS OUT) Activating PSPS Protocols / Potential to De-energize	IOU is considering a PSPS event due to incoming weather
STAGE 2 (48-24 HOURS OUT) Decision to De-energize	IOU determines it will shut off power to some or all areas considered in the PSPS event
STAGE 3 (TIME OF DE-ENERGIZATION) De-energization Initiated	IOU begins process of shutting off power to areas determined in prior notifications/stages
STAGE 4 Re-energization Initiated	IOU determines that the weather event has subsided and begins to assess power lines for re-energization
STAGE 5 Event Concluded	IOU re-energizes all lines shut off due to PSPS event or no lines were shut off and the period of concern has passed

- **General Education** – This section includes the steps to take throughout the year to educate key audiences (customers, stakeholders, media and employees) on Liberty's PSPS protocol, including factors taken into consideration to determine if a PSPS is warranted, distribution of event communications and potential timeline of events.

- **Resources** – This section includes communications templates, checklists and reference materials. The documents within the 'Resources' section can be clicked on through hyperlinks as they are referenced in the plan.

- **Protocols** – This section includes additional Liberty protocols.

Plan Instructions

Liberty will keep a copy of this plan both at the office and offsite in both electronic and paper format. It is the responsibility of the Senior Manager, Wildfire Prevention to provide a copy of the plan to each team member and other essential individuals for use in the event of a PSPS. It is also the responsibility of the Senior Manager, Wildfire Prevention to guarantee the plan is kept up to date, and team members have read the plan and understand its contents.

Plan Review

The Senior Manager, Wildfire Prevention will review this plan on an annual basis to check that:

- Contact information lists are current
- New California Public Utilities Commission (CPUC) requirements or identified risks are assessed and included
- Changes to company communications policies, practices or procedures are up to date

Roles and Responsibilities

The PSPS Team consists of individuals from the communications, wildfire mitigation, customer solutions, Operations, and customer care teams. *If extensive damage occurs during a PSPS event, Logistics and Finance representatives will be added to the PSPS Team.*

VP of Operations
oversees Liberty's PSPS response and share timely information with the Wildfire Mitigation Team. Additional responsibilities include:
- Communication with the operations team and PSPS Steering Committee
- Primary spokesperson for on-the-record media interview

Regulatory Affairs
oversees communications and notifications to the CPUC during the de-energization event. Additional responsibilities include:
- Coordination with the PSPS Team, VP of Operations and Senior Manager, Wildfire Prevention

Program Manager, External Communications
oversees communications and notifications to customers, media and the general public during the de-energization event. Additional responsibilities include:
- Coordination with the PSPS Team, VP of Operations and Senior Manager, Marketing and Communications

Senior Manager, Wildfire Prevention
oversees notification of public safety partners, first responders, critical facilities and elected officials during the de-energization event. Additional responsibilities include:
- Reporting back questions or concerns to VP of Operations and Senior Manager, Marketing and Communications
- Maintaining distribution lists
- Alternative spokesperson for on-the-record media interviews

Senior Manager, Marketing and Communications
oversees PSPS communications. Additional responsibilities include:
- Final approval and distribution to appropriate staff on external/internal information
- Communication with Liberty corporate leadership
- Documentation of communications efforts for CPUC-required report
- Coordination of support from Manager, Customer Care and Administrative Officer, and coordination with Senior Manager, Wildfire Prevention and Emergency Services Coordinator of dissemination of information
- Alternative spokesperson for on-the-record media interviews

Digital Communications

directly supports the Program Manager, External Communications and will oversee social media and web maintenance during the de-energization event. Additional responsibilities include:

- Reporting questions or concerns to Senior Manager, Marketing and Communications

Emergency Services Coordinator
directly supports the Senior Manager, Wildfire Prevention and will support Community Resource Centers (CRCs) during the de-energization event. Additional responsibilities include:

- Reporting questions or concerns to VP of Operations, Senior Manager, Wildfire Prevention and Senior Manager, Marketing and Communications, and Community Outreach Team

Operations Managers
oversees operation response to the de-energization event. Additional responsibilities include:

- Reporting back questions and concerns to the VP of Operations, Senior Manager, Wildfire Prevention and Senior Manager, Marketing and Communications

Senior Manager, GIS
directly supports the Operations Manager in identifying the outage footprint. Additional responsibilities include:

- Development of public safety partner portal
- Creation of outage maps
- Creation of customer outage lists

Manager, Customer Care
directly supports the Program Manager, External Communications and updates customer care on communications and notifications. Additional responsibilities include:

- Coordination with HR, Program Manager, External Communications and Senior Manager, Marketing and Communications
- Coordination of in-person outreach to sensitive customers

Senior Manager, Customer Solutions
oversees communications and notifications to sensitive and commercial customers and community-based organizations (CBOs). Additional responsibilities include:

- Setting up community update meetings
- Sending communications to appropriate groups

Manager III - Electric, Business and Community Development
directly supports Senior Manager, Customer Solutions with communications and notifications to sensitive and commercial customers and community-based organizations (CBOs). Additional responsibilities include:

- Setting up community update meetings
- Sending communications to appropriate groups

Manager II - WMP, Business and Community Development
directly supports Senior Manager, Customer Solutions with communications and notifications to sensitive customers, specifically access and functional needs (AFN) and medical baseline. Additional responsibilities include:

- Setting up community update meetings
- Sending communications to appropriate groups
- Supporting CRC activation and coordination

Director, Electric Control and Dispatch
oversees the identification of impacted customers and circuits. Additional responsibilities include:

- Development of impacted customer lists

Director, Government Affairs
oversees communications with elected officials. Additional responsibilities include:

- Coordinating with state and county officials

Administrative Officer
directly supports the Sr. Manager, Marketing and Communications and oversees the documentation of communications to supply in the post-PSPS event report to the CPUC. Additional responsibilities include:

- Arrangement of scheduled and emergency team meetings
- Setting up and coordinating the recording of data for reporting
- Reporting questions or concerns to Sr. Manager, Marketing and Communications

Introduction

In accordance with Senate Bill 901 and Rulemaking 18-10-007, Liberty adopted a Wildfire Mitigation Plan (WMP) to protect its service territory from utility-posed wildfires. One aspect of the WMP is a Public Safety Power Shutoff (PSPS). A PSPS is a safety procedure to proactively turn off power when and where conditions create a high wildfire risk. The practice of de-energization, which is becoming more and more frequent, is supported by the CPUC as a safety best practice and a last resort wildfire mitigation measure.

In light of lessons learned from other electric utilities, Liberty created this playbook to provide guidance over when, what, why and how to communicate with key audiences for PSPS events.

Key Audiences
Throughout the year and in the event of a PSPS (potential, imminent, implemented and restored), Liberty will need to communicate with the following audiences:

- CPUC
- Public safety partners (hyperlink to definition)
- First responders (hyperlink to definition)
- Critical facilities
- Residential customers
- Commercial customers
- Medical baseline
- Access and functional needs (AFN)
- Community-based organizations (CBO)
- Local, state and federal agencies
- Elected officials (local, state and federal)
- Entities with mutual assistance agreements
- Media
- General public

Stage 1 - Potential PSPS
72 HOURS UNTIL DE-ENERGIZATION

The directions and actions included herein should only be activated when a de-energization event is possible, but not yet confirmed. The label of **"Stage 1"** applies when weather forecasts indicate the possibility to meet de-energization thresholds; however, there is still a chance the weather will shift course, lessen in magnitude, or disintegrate entirely.

Stage 1 PSPS Assumptions
The following assumptions describe a typical environment in which communications for a **potential PSPS** would be activated in whole or in part:

- Weather conditions may exceed thresholds within **72 hours of a possible PSPS event**
- Forecasts indicate an alternate path for the weather system that removes Liberty from direct danger/contact
- Forecasts indicate the weather system may lose strength and no longer be at risk

Before Activating ***Potential PSPS*** Communications

Coordinate with Operations to:
1. Identify geographic area/portion of the grid at risk for de-energization
2. Identify circuits at risk for de-energization
3. Identify number of customers at risk for de-energization (segment customers by commercial, residential, medical baseline, and AFN)
4. Identify critical facilities at risk of de-energization
5. Identify approximate time of de-energization event
6. Develop map highlighting the de-energization zone

Communications Timeline and Tactics
In the event of a **potential PSPS,** Liberty may activate the following methods of communication over an approximate 72-hour period:

AM ACTIVITIES – Members of the Liberty PSPS Team should be prepared to complete these actions between the hours of 6 a.m. and 12 p.m.

Schedule reoccurring PSPS Steering Committee and Reax Engineering/Operations/Control and Dispatch meeting (between 6:30-7:30 a.m.) to discuss the potential PSPS event, including the factors that may warrant de-energization, coordination with public safety partners and first responders, anticipated number of impacted customers and next steps. Provide regular updates to this audience, as warranted and no less frequently than every eight hours. PSPS Steering Committee members – West Region President; California President, VP of Operations; Director, Customer Experience; Director, Operations; Senior Manager, Wildfire Prevention; GIS, PIO, Admin Officer, Legal; and Rates and Regulatory Affairs.

- **Responsibility**: VP of Operations

Customize and distribute **an alert to the PSPS Team (see roles and responsibilities)**, activating the PSPS Playbook. Detail the potential PSPS event, including the factors that may warrant de-energization, the anticipated length of the de-energization event, anticipated number of impacted customers and next steps.

- **Responsibility**: VP of Operations

Develop and distribute **an impacted customers list** to the PSPS Team.

- **Responsibility:** Director, Electric Control and Dispatch

Schedule a reoccurring meeting at 8 a.m. and 5 p.m. for members of the PSPS Team. Attach relevant documents or updates from Reax Engineering.

- **Responsibility**: Administrative Officer

Create and distribute **a shared document** to record communications and outreach efforts for the post-PSPS report to the CPUC.

- **Responsibility**: Administrative Officer
    - Supporting Player: Senior Manager, Marketing and Communications

Customize and distribute an **employee email** detailing the potential PSPS event, including the factors that may warrant de-energization, the anticipated length of the de-energization event, anticipated number of impacted customers and next steps.

- **Responsibility**: Senior Manager, Marketing and Communications

Customize and distribute **an email to Human Resources, Customer Service, Control and Dispatch and Operations** to begin preparations for PSPS staffing. Detail the potential PSPS event, including anticipated length of the de-energization event, anticipated number of impacted customers and next steps.

- **Responsibility**: VP of Operations

[7 a.m.] **Complete and submit PSPS Notification Form** detailing the potential PSPS event, including the factors that may warrant de-energization, the anticipated length of the de-energization event, link to GIS data, anticipated number of impacted customers (total and medical baseline), potentially impacted counties, planned outreach and next steps. **Call California State Warning Center at 916-845-8911 to confirm receipt.**

- **Responsibility**: Regulatory Affairs

Once the initial notification has been submitted, ongoing notifications must be received by Cal OES at 0700 and 1500 hours (7:00 a.m. and 3:00 p.m.) daily, as well as whenever there is a major change in the event (e.g., stage change, large change in potentially impacted customers, and/or the addition/removal of an impacted county), through the duration of the event. Utilities may submit up to one hour early of 0700 and 1500 hours. A notification submitted within this one-hour window will satisfy the 0700/1500 hours notification requirement. For instance, if a utility has a major scope change and submits a notification at 0615 hours, it would qualify as both the stage change and 0700 hours notification. The utility would not be required to submit again at 0700 hours.

Customize and distribute an **email to the CPUC** detailing the potential PSPS event, including the factors that may warrant de-energization, coordination with public safety partners and first responders, anticipated number of impacted customers and next steps.

- **Responsibility**: Regulatory Affairs

Develop and launch a **password-protected GIS portal** highlighting the potential de-energization zone.

- **Responsibility**: GIS Manager

Customize and distribute an **Everbridge alert to the public safety partners and critical facilities** within and immediately adjacent to the potential de-energization zone detailing the factors that may warrant de-energization, anticipated number of impacted customers (with emphasis on medical baseline and AFN customers), anticipated list of impacted critical facilities and next steps.

- **Responsibility**: Program Manager, External Communications
    - **Supporting Players**: Senior Manager, Wildfire Prevention

Customize and distribute an **email to the elected officials** within and immediately adjacent to the potential de-energization zone detailing the factors that may warrant de-energization, anticipated number of impacted customers (with emphasis on medical baseline and AFN customers), anticipated list of impacted critical facilities and next steps.

- **Responsibility**: Director, Government Affairs
    - **Supporting Players**: Program Manager, External Communications
    - **Supporting Player:** Senior Manager, Customer Solutions to make sure there are no duplications in contacts

Customize and distribute **talking points to the CSRs** in the local offices and New Hampshire and to field staff who may be approached by customers or members of the general public.

- **Responsibility**: Senior Manager, Marketing and Communications

Customize and distribute **an alert to Medical Baseline and AFN customers** via the Everbridge alert system (text, email and voice message) detailing the potential need to de-energize the grid.

- **Responsibility:** Manager II – WMP, Business and Community Development
    - **Supporting Player:** Program Manager, External Communications

SUBTASKS:

Collaborate with the CSRs to **directly call known medical baseline and AFN customers** who did not acknowledge receipt of the Everbridge alert.

- **Responsibility**: Manager, Customer Care and Manager II – WMP, Business and Community Development

For those who remain unreachable, customize and distribute **door hangers** to known medical baseline and AFN customers who did not acknowledge receipt of the Everbridge alert.

- **Responsibility**: Manager, Customer Care and Manager II – WMP, Business and Community Development

Customize and distribute an alert to key customers including commercial accounts, cities, towns, schools, and chambers via personal call and/or email the potential need to de-energize the grid.

- **Responsibility:** Senior Manager, Customer Solutions and Manager III – Electric, Business and Community Development
    - **Supporting Player:** Program Manager, External Communications
    - **Supporting Player:** Director, Government Affairs to make sure there are no duplications in contacts

Customize and distribute a **web alert** to the appropriate community pages on the website acknowledging potential de-energization conditions and encouraging customers to take safety precautions.

- **Responsibility**: Digital Communications Lead
    - **Supporting Player**: Senior Manager, Marketing and Communications

Alert IT to begin landing and PSPS webpage protocol. Contact Brian Mottershead, Lisa Craig, Mila Pavluk, Ed Mohacsy, Matt Comeau, and Glen West to initiate the process.

- **Responsibility**: Digital Communications Lead
    - **Supporting Player**: Senior Manager, Marketing and Communications

PM ACTIVITIES – Members of the Liberty PSPS Team should be prepared to complete these actions between the hours of 1 p.m. and 8 p.m.

Customize and distribute **an email to the PSPS Steering Committee** updating weather conditions warranting a potential PSPS event, coordination with public safety partners and first responders, anticipated number of impacted customers and next steps. Provide regular updates to this audience, as warranted and no less frequently than every eight hours. PSPS Steering Committee members – West Region President; California President, VP of Operations; Director, Customer Experience; Director, Operations; Senior Manager, Wildfire Prevention; Legal; and Rates and Regulatory Affairs.

- **Responsibility**: VP of Operations

Customize and distribute **an employee email** updating weather conditions warranting a potential PSPS event, the anticipated length of the de-energization event, anticipated number of impacted customers and next steps.

- **Responsibility**: Senior Manager, Marketing and Communications

[3 PM] **Complete and submit PSPS Notification Form** detailing the potential PSPS event, including the factors that may warrant de-energization, the anticipated length of the de-energization event, link to GIS data, anticipated number of impacted customers (total and medical baseline), potentially impacted counties, planned outreach and next steps.

- **Responsibility**: Regulatory Affairs

Customize and distribute an **email to the CPUC** updating weather conditions warranting a potential PSPS event, coordination efforts with public safety partners and first responders and next steps.

- **Responsibility**: Regulatory Affairs

Host a **PSPS State Executive Briefing** at 1600 [4 p.m.] every day until the conclusion of the de-energization event.

- **Responsibility**: Regulatory Affairs
    - **Supporting Player**: VP of Operations and Senior Manager, Wildfire Prevention

Customize and distribute an **email and Everbridge alert to the public safety partners and critical facilities** updating weather conditions warranting a potential PSPS event, anticipated number of impacted customers (with emphasis on medical baseline and AFN customers), anticipated list of impacted critical facilities and next steps.

- **Responsibility**: Senior Manager, Wildfire Prevention
    - **Supporting Player**: Emergency Services Coordinator

Customize and distribute an **email to the elected officials** updating weather conditions warranting a potential PSPS event, anticipated number of impacted customers (with emphasis on medical baseline and AFN customers), anticipated list of impacted critical facilities and next steps.

- **Responsibility**: Director of Government Affairs
    - **Supporting Player**: Program Manager, External Communications
    - **Supporting Player:** Senior Manager, Customer Solutions to make sure there are no duplications in contacts

CRC Communications Preparation – at this stage, the Emergency Services Coordinator should coordinate with the VP Ops, HR, Sr. Manager Marketing and Manager, Customer Care regarding a communications staffing plan and resources that will be made available at CRCs activated in the service area.

- Identify the location(s) of the CRC(s) to be activated
- Contact the appropriate representative for the identified CRC(s) to confirm use of facilities.
- Activate the delivery of CRC-related supplies from storage unit
- Identify and contact two Liberty representatives to staff each CRC location

- **Responsibility**: Emergency Services Coordinator
    - **Supporting Player**: Manager II WMP Business and Community Development

Confirm record of all actions during Stage 1 (72 hours from de-energization event) of the de-energization event.

- **Responsibility**: Administrative Officer
    - **Supporting Players**: VP of Operations; Senior Manager, Wildfire Prevention; Senior Manager, Marketing and Communications; Regulatory Affairs; Program Manager, External Communications; Emergency Services Coordinator; and Digital Communications Lead

At this stage, Liberty should be prepared to elevate the PSPS risk from "potential" to "imminent" or cancel the warning entirely.

Potential PSPS Checklist

VP OF OPERATIONS

☐ Schedule reoccurring PSPS Steering Committee and Reax Engineering/Operations/Control and Dispatch meeting
☐ Alert PSPS Team
☐ Email to the PSPS Steering Committee
☐ Email to HR, Customer Service, Dispatch and Operations

REGULATORY AFFAIRS

☐ Email to CPUC
☐ Host a PSPS State Executive Briefing
☐ Submit PSPS Notification form

DIRECTOR, CONTROL AND DISPATCH

☐ Email customer list

PROGRAM MANAGER, EXTERNAL COMMUNICATIONS

☐ AM –Everbridge alert to public safety partners and critical facilities
☐ PM –Everbridge alert to public safety partners and critical facilities

SENIOR MANAGER, MARKETING AND COMMUNICATIONS

☐ AM - Distribute employee email
☐ Distribute talking points to the CSRs
☐ PM - Distribute employee email

DIGITAL COMMUNICATIONS LEAD

☐ Web alert
☐ Alert IT to launch microsite

ADMINISTRATIVE OFFICER

☐ Schedule reoccurring meeting at 8 a.m. and 5 p.m. for EOC Team
☐ Distribute the sequence of events tracker
☐ Complete the IC Action plan for the 6:30 am meeting
☐ Email the IC Action Plan to the 8:00 am EOC group
☐ Back up sequence of events tracker

GIS MANAGER

☐ Launch password-protected GIS portal

SENIOR MANAGER, CUSTOMER SOLUTIONS AND MANAGER III - ELECTRIC, BUSINESS AND COMMUNITY DEVELOPMENT

☐ Distribute email and/or personal call to key customers including commercial accounts, cities, towns, schools, and chambers

DIRECTOR, GOVERNMENT AFFAIRS

☐ Distribute email to elected officials

EMERGENCY SERVICES COORDINATOR

☐ Identify CRC location(s)

☐ Contact representative(s) of identified CRC location(s)

☐ Activate delivery of CRC supplies

☐ Identify and contact two Liberty representative to staff each CRC location

Stage 2.a - Imminent PSPS

48 HOURS UNTIL DE-ENERGIZATION

Overview

The directions and actions included herein should only be activated when a de-energization event is projected to begin within 48 hours. The label of **"stage 2"** would be applicable when weather forecasts will undoubtedly meet de-energization thresholds.

Stage 2 PSPS Assumptions

The following assumptions describe a typical environment in which communications for an **imminent PSPS** would be activated in whole or in part:

- Weather/fire conditions will exceed thresholds within 48 hours
- Forecasts indicate no, or a very unlikely, alternate path for the weather system that removes Liberty from direct danger/contact

Before Activating *Imminent PSPS* Communications

Coordinate with Operations to:
1. Identify geographic area/ portion of the grid at risk for de-energization
2. Identify circuits at risk for de-energization
3. Identify number of customers at risk for de-energization (segment customers by commercial, residential, medical baseline, and AFN)
4. Identify critical facilities at risk of de-energization
5. Identify approximate time of de-energization event
6. Develop map highlighting the de-energization zone
7. Confirm locations of Community Resource Centers (CRC) with Operations team

Communications Timeline and Tactics

In the event of an **imminent PSPS,** Liberty may activate the following methods of communication over an approximate 48-hour period:

AM ACTIVITIES – Members of the Liberty PSPS Team should be prepared to complete these actions between the hours of 6 a.m. and 12 p.m.

PSPS Steering Committee and Reax Engineering/Operations/Control and Dispatch meet (between 6:30-7:30 a.m.) to discuss the imminent PSPS event, including the factors that may warrant de-energization, coordination with public safety partners and first responders, anticipated number of impacted customers and next steps. Provide regular updates to this audience, as warranted and no less frequently than every eight hours. PSPS Steering Committee members – West Region President; California President; VP of Operations; Director, Customer Experience;

Director, Operations; Senior Manager, Wildfire Prevention; GIS, PIO, Admin Officer, Legal; and Rates and Regulatory Affairs.

- **Responsibility**: VP of Operations

Customize and distribute **an alert to the PSPS Team** notifying the group of current conditions, including the factors that may warrant de-energization, the anticipated length of the de-energization event, anticipated number of impacted customers and next steps.

- **Responsibility**: VP of Operations

Develop and distribute **an impacted customers list** to the PSPS Team.

- **Responsibility:** Director, Electric Control and Dispatch

Customize and distribute **an email to Human Resources, Customer Service, Control and Dispatch and Operations** to confirm staffing for the PSPS event. Detail the potential PSPS event, including anticipated length of the de-energization event, anticipated number of impacted customers and next steps.

- **Responsibility**: VP of Operations

Customize and distribute **talking points and a call-hold message** to the CSRs in the local offices and New Hampshire.

- **Responsibility**: Senior Manager, Marketing and Communications

Customize and distribute **an employee email** updating weather conditions warranting a potential PSPS event, the anticipated length of the de-energization event, anticipated number of impacted customers and next steps.

- **Responsibility**: Senior Manager, Marketing and Communications

Finalize the location(s) and staffing plans for anticipated CRC facilities. Confirm necessary materials/supplies and staff member for opening of CRCs 24-hours from start of de-energization event.

- **Responsibility**: Emergency Services Coordinator and Manager II WMP Business and Community Development

Update the **password-protected GIS portal** highlighting the potential de-energization zone.

- **Responsibility**: GIS Manager

[7 a.m.] **Complete and submit PSPS Notification Form** detailing the potential PSPS event, including the factors that may warrant de-energization, the anticipated time of de-energization and restoration, link to GIS data, anticipated number of impacted customers (total and medical baseline), impacted counties, planned outreach and next steps. Call California State Warning Center at 916-845-8911 to confirm receipt.

- **Responsibility**: Regulatory Affairs

Customize and distribute an **email to the CPUC** detailing the imminent PSPS event, including the factors that warrant de-energization, coordination with public safety partners and first responders, anticipated number of impacted customers and next steps.

- **Responsibility**: Regulatory Affairs
    - **Supporting Player**: VP of Operations

Customize and distribute **an Everbridge alert to public safety partners and critical facilities** within and immediately adjacent to the de-energization zone detailing the factors that warrant de-energization, anticipated number of impacted customers (with emphasis on medical baseline and AFN customers), anticipated list of impacted critical facilities, CRC plans and next steps.

- **Responsibility**: Program Manager, External Communications
    - **Supporting Player**: Senior Manager, Wildfire Prevention

Customize and distribute **an email to elected officials** within and immediately adjacent to the de-energization zone detailing the factors that warrant de-energization, anticipated number of impacted customers (with emphasis on medical baseline and AFN customers), anticipated list of impacted critical facilities, CRC plans and next steps.

- **Responsibility**: Director, Government Affairs
    - **Supporting Player**: Program Manager, External Communications
    - **Supporting Player:** Senior Manager, Customer Solutions to make sure there are no duplications in contacts

Customize and distribute **an email to CBOs** within and immediately adjacent to the de-energization zone detailing the factors that may warrant de-energization, anticipated number of impacted customers, CRC plans and resources to help support sensitive customers.

- **Responsibility**: Manager II - WMP, Business and Community Development, Senior Manager, Customer Solutions

Customize and distribute **an alert to potentially impacted customers** via the Everbridge alert system (text, email and voice message) announcing the imminent de-energization event and encouraging customers to take safety precautions. Include details regarding plans to activate

CRCs throughout the service area. **Contact Control and Dispatch for updated customer list and segment alert (general public vs. medical baseline customers).**

- **Responsibility**: Program Manager, External Communications and Manager II - WMP, Business and Community Development
    - **Supporting Player**: Director, Electric Control and Dispatch

Customize and distribute an alert to key customers including commercial accounts, cities, towns, schools, and chambers via personal call and/or email the potential need to de-energize the grid.

- **Responsibility:** Senior Manager, Customer Solutions and Manager III – Electric, Business and Community Development
    - **Supporting Player:** Program Manager, External Communications
    - **Supporting Player:** Director, Government Affairs to make sure there are no duplications in contacts

Customize and distribute **a press release** to local media outlets announcing the imminent de-energization event and encouraging customers to take safety precautions. Include information regarding plans to activate CRCs throughout the service area.

- **Responsibility**: Program Manager, External Communications

Customize and distribute **a PSA** to local radio outlets announcing the imminent de-energization event and encouraging customers to take safety precautions.

- **Responsibility**: Program Manager, External Communications

Customize and distribute **a Changeable Message Sign (CMS) template** to Caltrans announcing the imminent de-energization event. Contact rafiq.al-khalili@dot.ca.gov with requested message.

- **Responsibility**: Program Manager, External Communications

Customize and distribute **a web alert** to the appropriate community pages on the website announcing the imminent de-energization event and encouraging customers to take safety precautions. Include information regarding plans to activate CRCs in the service area.

- **Responsibility**: Digital Communications Lead
    - **Supporting Player**: Senior Manager, Marketing and Communications

Update the microsite announcing the imminent de-energization event, sharing relevant maps, CRC locations/hours and encouraging customers to take safety precautions. Contact Brian Mottershead, Lisa Craig, Mila Pavluk, Ed Mohacsy, and Glen West to initiate the process.

- **Responsibility**: Digital Communications Lead
    - **Supporting Player**: Senior Manager, Marketing and Communications

Customize and distribute **an alert to Facebook and Twitter** announcing the imminent de-energization event and encouraging customers to take safety precautions. Include information regarding plans to activate CRCs in the service area.

- **Responsibility**: Digital Communications Lead
    - **Supporting Player**: Senior Manager, Marketing and Communications

PM ACTIVITIES – Members of the Liberty PSPS Team should be prepared to complete these actions between the hours of 1 p.m. and 8 p.m.

[3 PM] **Complete and submit PSPS Notification Form** detailing the potential PSPS event, including the factors that may warrant de-energization, the anticipated time of de-energization and restoration, link to GIS data, anticipated number of impacted customers (total and medical baseline), impacted counties, planned outreach and next steps. Call California State Warning Center at 916-845-8911 to confirm receipt.

- **Responsibility**: Regulatory Affairs

Host a **PSPS State Executive Briefing** at 1600 (4 p.m.) every day until the conclusion of the de-energization event.

- **Responsibility**: Regulatory Affairs
    - **Supporting Players**: VP of Operations and Senior Manager, Wildfire Prevention

Host an informational call with public safety partners and critical facilities to share greater detail regarding the scope and impact of the PSPS event, coordinate on response to sensitive populations (medical baseline and AFN customers) and discuss preparations for an Emergency Operations Center (EOC). REQUIRED: log the date, time and length of call to include in post-PSPS report to CPUC. If call is done via WebEx, please record and log the audio/video file.

- **Responsibility**: Senior Manager, Wildfire Prevention
    - **Supporting Player**: Emergency Services Coordinator

Collaborate with CSRs to **directly call known medical baseline and AFN customers** who did not acknowledge receipt of the Everbridge alert.

- **Responsibility**: Manager, Customer Care and Manager II - WMP, Business and Community Development

For those who remain unreachable, customize and distribute **door hangers** to known medical baseline and AFN customers who did not acknowledge receipt of the Everbridge alert.

- **Responsibility**: Manager, Customer Care and Manager II - WMP, Business and Community Development

Customize and distribute **messaging material to CBOs** to disseminate on feasible platforms of their choosing.

- **Responsibility**: Manager II - WMP, Business and Community Development, Senior Manager, Energy Efficiency and Customer Solutions

Confirm record of all actions during Stage 2 (48 hours from de-energization event) of the de-energization event.

- **Responsibility**: Administrative Officer
    - **Supporting Players**: VP of Operations; Senior Manager, Wildfire Prevention; Senior Manager, Marketing and Communications; Regulatory Affairs; Program Manager, External Communications; Emergency Services Coordinator; and Digital Communications Lead

REQUIRED: log the date, time and copy of advocacy outreach to include in post-PSPS report to CPUC.

Before engaging the "Updated Imminent PSPS Notification" tactics, check in with the ops team to identify potential changes in the range of the PSPS event, including grids and list of impacted customers.

Stage 2.a (48 HOURS – Imminent) PSPS Checklist

Upon completion of each tactic listed in the imminent PSPS 48 hours section, please check off the respective box below.

VP OF OPERATIONS

☐ Participate in PSPS Steering Committee and Reax Engineering/Operations/Control and Dispatch meeting
☐ Alert PSPS Team
☐ Email to HR, Customer Service, Dispatch and Operations

REGULATORY AFFAIRS

☐ Email to CPUC
☐ Host a PSPS State Executive Briefing (1600/4 PM)
☐ Submit PSPS Notification form [0700 and 1500 hours]

DIRECTOR, CONTROL AND DISPATCH

☐ Email customer list

PROGRAM MANAGER, EXTERNAL COMMUNICATIONS

☐ Everbridge alert to public safety partners and critical facilities
☐ Alert to all potentially impacted customers
☐ Press release
☐ Distribute radio PSA
☐ Distribute Changeable Message Sign (CMS)

SENIOR MANAGER, WILDFIRE PREVENTION

☐ Host informational call with public safety partners and critical facilities

SENIOR MANAGER, MARKETING AND COMMUNICATIONS

☐ Distribute employee email
☐ Distribute talking points to the CSRs

DIGITAL COMMUNICATIONS LEAD

☐ Web alert
☐ Update microsite
☐ Facebook alert
☐ Twitter alert

ADMINISTRATIVE OFFICER

☐ Distribute the sequence of events tracker ☐ Complete the IC Action plan for the 6:30 am meeting
☐ Email the IC Action Plan to the 8:00 am EOC group

☐ Back up sequence of events tracker

SENIOR MANAGER, CUSTOMER SOLUTIONS AND MANAGER III - ELECTRIC, BUSINESS AND COMMUNITY DEVELOPMENT

☐ Distribute alert to key customers

MANAGER III - ELECTRIC, BUSINESS AND COMMUNITY DEVELOPMENT

☐ Distribute messaging material to CBOs

DIRECTOR, GOVERNMENT AFFAIRS

☐ Distribute email to elected officials

EMERGENCY SERVICES COORDINATOR

☐ Finalize CRC location(s) and staffing plan

GIS MANAGER

☐ Update password-protected GIS portal

Stage 2.b - Imminent PSPS

24 HOURS UNTIL DE-ENERGIZATION

Overview

The directions and actions included herein should only be activated when a de-energization event is projected to begin within 24 hours. The label of **"stage 2"** would be applicable when weather forecasts will undoubtedly meet de-energization thresholds.

Stage 2 PSPS Assumptions

The following assumptions describe a typical environment in which communications for an **imminent PSPS** would be activated in whole or in part:

- Weather/fire conditions will exceed thresholds within 24 hours
- Forecasts indicate no, or a very unlikely, alternate path for the weather system that removes Liberty from direct danger/contact

Before Activating *Imminent PSPS* Communications

Coordinate with Operations to:

1. Identify geographic area/ portion of the grid at risk for de-energization
2. Identify circuits at risk for de-energization
3. Identify number of customers at risk for de-energization (segment customers by commercial, residential, medical baseline and AFN)
4. Identify critical facilities at risk of de-energization
5. Identify approximate time of de-energization event
6. Develop map highlighting the de-energization zone
7. Confirm locations of Community Resource Centers (CRC) with Operations team

Communications Timeline and Tactics

In the event of an **imminent PSPS,** Liberty may activate the following methods of communication over an approximate 24-hour period:

AM ACTIVITIES – Members of the Liberty PSPS Team should be prepared to complete these actions between the hours of 6 a.m. and 12 p.m.

PSPS Steering Committee and Reax Engineering/Operations/Control and Dispatch meet (between 6:30-7:30 a.m.) to discuss the imminent PSPS event, including the factors that may warrant de-energization, coordination with public safety partners and first responders, anticipated number of impacted customers and next steps. Provide regular updates to this audience, as warranted and no less frequently than every eight hours. PSPS Steering Committee members –

West Region President; California President; VP of Operations; Director, Customer Experience; Director, Operations; Senior Manager, Wildfire Prevention; GIS, PIO, Admin Officer, Legal; and Rates and Regulatory

- **Responsibility**: VP of Operations

Customize and distribute **an alert to the PSPS Team** notifying the group of current conditions, including the factors that may warrant de-energization, the anticipated length of the de-energization event, anticipated number of impacted customers and next steps.

- Responsibility: VP of Operations

Develop and distribute **an impacted customers list** to the PSPS Team.

- **Responsibility:** Director, Electric Control and Dispatch

Customize and distribute **an email to Human Resources, Customer Service, Control and Dispatch and Operations** to confirm staffing for the PSPS event. Detail the potential PSPS event, including anticipated length of the de-energization event, anticipated number of impacted customers and next steps.

- **Responsibility**: VP of Operations

Customize and distribute updated **talking points and a call-hold message** to the CSRs in the local offices and New Hampshire.

- **Responsibility**: Senior Manager, Marketing and Communications

Customize and distribute **an employee email** updating weather conditions warranting a potential PSPS event, the anticipated length of the de-energization event, anticipated number of impacted customers and next steps.

- **Responsibility**: Senior Manager, Marketing and Communications

[7 AM] **Complete and submit PSPS Notification Form** detailing the potential PSPS event, including the factors that may warrant de-energization, the anticipated time of de-energization and restoration, link to GIS data, anticipated number of impacted customers (total and medical baseline), impacted counties, planned outreach and next steps. Call California State Warning Center at 916-845-8911 to confirm receipt.

- **Responsibility**: Regulatory Affairs

Customize and distribute **an email to the CPUC** detailing the time of de-energization, anticipated length of the PSPS, coordination with public safety partners and first responders and next steps.

- **Responsibility**: Regulatory Affairs
    - **Supporting Player**: VP of Operations

Customize and distribute **an Everbridge alert to public safety partners and critical facilities** within and immediately adjacent to the de-energization zone detailing the time of de-energization, anticipated length of the PSPS, confirmed number of impacted customers (with emphasis on medical baseline and AFN customers), CRC plans and confirmed list of impacted critical facilities and next steps.

- **Responsibility**: Senior Manager, Wildfire Prevention
    - **Supporting Player**: Program Manager, External Communications

Customize and distribute **an email to elected officials** within and immediately adjacent to the de-energization zone detailing the time of de-energization, anticipated length of the PSPS, coordination with public safety partners and first responders, confirmed number of impacted customers, CRC plans and next steps.

- **Responsibility**: Director, Government Affairs
    - **Supporting Player**: Program Manager, External Communications

Customize and distribute **an email to CBOs** detailing the time of de-energization, anticipated length of the PSPS, confirmed number of impacted customers, CRC plans and available resources to support sensitive customers.

- **Responsibility**: Manager II - WMP, Business and Community Development, Senior Manager, Customer Solutions

Customize and distribute **an alert to impacted customers** via the Everbridge alert system (text, email and voice message) detailing the time of de-energization, anticipated length of the PSPS and CRC plans.

- **Responsibility**: Program Manager, External Communications

Customize and distribute an alert to key customers including commercial accounts, cities, towns, schools, and chambers via personal call and/or email the potential need to de-energize the grid.

- **Responsibility:** Senior Manager, Customer Solutions and Manager III – Electric, Business and Community Development
    - **Supporting Player:** Program Manager, External Communications

- **Supporting Player:** Director, Government Affairs to make sure there are no duplications in contacts

Customize and distribute **a press release** to local media outlets announcing time of de-energization event, anticipated length, CRC plans and safety precautions to take while without energy.

- **Responsibility**: Program Manager, External Communications

Customize and **distribute a PSA** to local radio outlets announcing time of de-energization event, anticipated length and safety precautions to take while without energy.

- **Responsibility**: Program Manager, External Communications

Update the microsite announcing time of de-energization event, anticipated length, CRC locations/hours and safety precautions to take while without energy. Contact Brian Mottershead, Lisa Craig, Mila Pavluk, Ed Mohacsy, and Glen West to initiate the process.

- **Responsibility**: Digital Communications Lead
  - **Supporting Player**: Senior Manager, Marketing and Communications

Customize and **distribute an alert to Facebook and an alert to Twitter** announcing time of de-energization event, anticipated length, CRC locations/hours and safety precautions to take while without energy.

- **Responsibility**: Digital Communications Lead
  - **Supporting Player**: Senior Manager, Marketing and Communications

Schedule a reoccurring meeting [1 p.m.] with public safety partners and critical facilities via Teams.

- **Responsibility**: Administrative Officer

Schedule a reoccurring meeting [2 p.m.] with customers and CBOs via Go-To Meeting.

- **Responsibility**: Administrative Officer

PM ACTIVITIES – Members of the Liberty PSPS Team should be prepared to complete these actions between the hours of 1 p.m. and 8 p.m.

[1 p.m.] Host an informational call with public safety partners and critical facilities to share greater detail regarding the scope and impact of the PSPS event, coordinate on response to sensitive populations (medical baseline and AFN customers) and discuss preparations for an Emergency Operations Center (EOC). REQUIRED: log the date, time and length of call to include

in post-PSPS report to CPUC. If call is done via Teams, please record and log the audio/video file.

- **Responsibility**: Senior Manager, Wildfire Prevention
    - **Supporting Player**: Emergency Services Coordinator

[2 p.m.] Host an informational call with CBOs and Customers to provide additional information and an opportunity for participants to ask questions.

- **Responsibility**: Senior Manager, Wildfire Prevention
    - **Supporting Player**: Emergency Services Coordinator

[3 p.m.] **Complete and submit PSPS Notification Form** detailing the potential PSPS event, including the factors that may warrant de-energization, the anticipated time of de-energization and restoration, link to GIS data, anticipated number of impacted customers (total and medical baseline), impacted counties, planned outreach and next steps. Call California State Warning Center at 916-845-8911 to confirm receipt.

- **Responsibility**: Regulatory Affairs

Customize and distribute an **email to the CPUC** detailing the time of de-energization, anticipated length of the PSPS, coordination with public safety partners and first responders and next steps.

- **Responsibility**: Regulatory Affairs

Host a **PSPS State Executive Briefing** at 1600 (4 p.m.) every day until the conclusion of the de-energization event.

- **Responsibility**: Regulatory Affairs
    - **Supporting Players**: VP of Operations and Senior Manager, Wildfire Prevention

Collaborate with the CSRs to **directly call known medical baseline and AFN customers** who did not acknowledge receipt of the Everbridge alert.

- **Responsibility**: Manager, Customer Care and Manager II - WMP, Business and Community Development

For those who remain unreachable, customize and distribute **door hangers** to all known medical baseline and AFN customers who did not acknowledge receipt of the Everbridge alert.

- **Responsibility**: Manager, Customer Care and Manager II - WMP, Business and Community Development

<u>Confirm record of all actions during Stage 2</u> (24 hours from de-energization event) of the de-energization event.

- **Responsibility**: Administrative Officer
    - **Supporting Players**: VP of Operations; Senior Manager, Wildfire Prevention; Senior Manager, Marketing and Communications; Regulatory Affairs; Program Manager, External Communications; Emergency Services Coordinator; and Digital Communications Lead

At this stage, Liberty shall be prepared to elevate the PSPS risk from "imminent" to "implemented" and activate CRCs that are planned for service.

Stage 2.b (24 HOURS – Imminent) PSPS Checklist

Upon completion of each tactic listed in the imminent PSPS 24 hours section, please check off the respective box below.

VP OF OPERATIONS

☐ Participate in PSPS Steering Committee and Reax Engineering/Operations/Control and Dispatch meeting
☐ Alert PSPS Team

REGULATORY AFFAIRS

☐ AM - Email to CPUC
☐ Host a PSPS State Executive Briefing (1600/4 PM)
☐ PM - Email to CPUC
☐ Submit PSPS Notification form [0700 and 1500 hours]

DIRECTOR, CONTROL AND DISPATCH

☐ Email customer list

PROGRAM MANAGER, EXTERNAL COMMUNICATIONS

☐ Everbridge alert to public safety partners and critical facilities
☐ Everbridge alert to all potentially impacted customers
☐ Press release
☐ Distribute radio PSA
☐ Distribute Changeable Message Sign (CMS)

SENIOR MANAGER, WILDFIRE PREVENTION

☐ Host informational call with public safety partners and critical facilities

SENIOR MANAGER, MARKETING AND COMMUNICATIONS

☐ Distribute employee email
☐ Distribute talking points to the CSRs

DIGITAL COMMUNICATIONS LEAD

☐ Update microsite
☐ Facebook alert
☐ Twitter alert

ADMINISTRATIVE OFFICER

☐ Distribute the sequence of events tracker
☐ Schedule a reoccurring meeting at 1:00 pm for Public Safety Partners and Critical Facilities (TEAMS)
☐ Schedule a reoccurring meeting at 2:00 pm for CBOs and Customers (Go To Meeting)

☐ Complete the IC Action plan for the 6:30 am meeting
☐ Email the IC Action Plan to the 8:00 am EOC group
☐ Back up sequence of events tracker

SENIOR MANAGER, CUSTOMER SOLUTIONS AND MANAGER III - ELECTRIC, BUSINESS AND COMMUNITY DEVELOPMENT

☐ Distribute email to CBOs
☐ Distribute alert to key commercial customers

DIRECTOR, GOVERNMENT AFFAIRS

☐ Distribute email to elected officials

EMERGENCY SERVICES COORDINATOR

☐ Open all CRC locations

Stage 3 - IMPLEMENTED PSPS

DE-ENERGIZATION INITIATED UNTIL CONDITIONS IMPROVE

Overview

The directions and actions included herein should only be activated when a de-energization event is activated. The label of **"stage 3"** would be applicable when Liberty turns off power.

Stage 3 PSPS Assumptions

The following assumptions describe a typical environment in which communications for an **implemented PSPS** would be activated in whole or in part:

- Weather/fire conditions will exceed thresholds within **1-4 hours**
- Forecasts indicate no, or a very unlikely, alternate path for the weather system that removes Liberty from direct danger/contact

Before Activating ***Implemented PSPS*** Communications

Coordinate with Operations to:
1. Confirm geographic area/ portion of the grid experiencing the de-energization event
2. Confirm number of customers experiencing de-energization (segment customers by commercial, residential, medical baseline and AFN)
3. Confirm critical facilities experiencing de-energization
4. Confirm map of the de-energization zone
5. Confirm location and opening time of CRC

Communications Timeline and Tactics

In the event of an **implemented PSPS,** Liberty may activate the following methods of communication over the duration of the de-energization event:

AM ACTIVITIES – Members of the Liberty PSPS Team should be prepared to complete these actions between the hours of 6 a.m. and 12 p.m.

PSPS Steering Committee and Reax Engineering/Operations/Control and Dispatch meet (between 6:30 – 7:30 a.m.) to discuss the implementation of the PSPS event, including the factors that warrant de-energization, coordination with public safety partners and first responders, confirmed number of impacted customers and next steps. Provide regular updates to this audience, as warranted and no less frequently than every eight hours. PSPS Steering Committee members – West Region President; California President; VP of Operations; Director, Customer

Experience; Director, Operations; Senior Manager, Wildfire Prevention; GIS, PIO, Admin Officer, Legal; and Rates and Regulatory Affairs.

- **Responsibility**: VP of Operations

Customize and distribute **an alert to the PSPS Team** notifying the group of current conditions, including the factors that warrant de-energization, the anticipated length of the de-energization event, anticipated number of impacted customers and next steps.

- **Responsibility**: VP of Operations

Develop and distribute **an impacted customers list** to the PSPS Team.

- **Responsibility:** Director, Electric Control and Dispatch

Customize and distribute **an email to Human Resources, Customer Service, Control and Dispatch and Operations** to confirm staffing for the PSPS event. Detail the current conditions of the PSPS event, including anticipated length of the de-energization event, number of impacted customers and next steps. Email Blaine Ladd.

- **Responsibility**: VP of Operations

Customize and distribute **talking points to the CSRs** in the local offices and New Hampshire, the Emergency Services Coordinator and field staff who may be approached by customers or members of the general public.

- **Responsibility**: Senior Manager, Marketing and Communications

[7 AM] **Complete and submit PSPS Notification Form** detailing the potential PSPS event, including the factors that may warrant de-energization, the anticipated time of de-energization and restoration, link to GIS data, anticipated number of impacted customers (total and medical baseline), impacted counties, planned outreach and next steps. Call California State Warning Center at 916-845-8911 to confirm receipt.

- **Responsibility**: Regulatory Affairs

Customize and distribute **an employee email** announcing the de-energization of the grid, the anticipated length of the de-energization event, anticipated number of impacted customers and next steps.

- **Responsibility:** Senior Manager, Marketing and Communications

TIME OF DE-ENERGIZATION ACTIVITIES – Members of the Liberty PSPS Team should be prepared to complete these actions at the exact time of de-energization, regardless of the time of day.

Complete and submit PSPS Notification Form detailing the active PSPS event, including the factors that may warrant de-energization, the anticipated time of de-energization and restoration, link to GIS data, anticipated number of impacted customers (total and medical baseline), impacted counties, planned outreach and next steps. Call California State Warning Center at 916-845-8911 to confirm receipt.

- **Responsibility**: Regulatory Affairs

Customize and distribute **an alert to impacted customers** via the Everbridge alert system (text and email. DO NOT USE voice message if power will be turned off in the middle of the night) announcing the de-energization of the grid, anticipated length of the PSPS and CRC locations/hours.

- **Responsibility**: Program Manager, External Communications

Customize and distribute **Everbridge alert to public safety partners and critical facilities** within and immediately adjacent to the de-energization zone announcing the de-energization of the grid, anticipated re-energization timeframe, CRC locations/hours and next steps.

- **Responsibility**: Senior Manager, Wildfire Prevention
    - **Supporting Player**: Program Manager, External Communications

Customize and distribute **an email to elected officials** within and immediately adjacent to the de-energization zone announcing the de-energization of the grid, anticipated re-energization timeframe, CRC locations/hours and next steps.

- **Responsibility**: Director, Government Affairs
    - **Supporting Player**: Program Manager, External Communications

Customize and distribute an alert to key customers including commercial accounts, cities, towns, schools, and chambers via personal call and/or email the potential need to de-energize the grid.

- **Responsibility:** Senior Manager, Customer Solutions and Manager III – Electric, Business and Community Development
    - **Supporting Player:** Program Manager, External Communications
    - **Supporting Player:** Director, Government Affairs to make sure there are no duplications in contacts

Customize and distribute **a press release** to local media outlets announcing the de-energization of the grid, anticipated re-energization timeframe, CRC locations/hours and safety precautions to take while without energy.

- **Responsibility**: Program Manager, External Communications

Customize and distribute **a PSA** to local radio outlets announcing the de-energization of the grid, anticipated re-energization timeframe and safety precautions to take while without energy.

- **Responsibility**: Program Manager, External Communications

Customize and distribute **a CMS template** to Caltrans announcing de-energization of the grid. Contact rafiq.al-khalili@dot.ca.gov with requested message.

- **Responsibility**: Program Manager, External Communications

Update the microsite announcing time of de-energization event, anticipated re-energization timeframe, CRC locations/hours and safety precautions to take while without energy. Contact Brian Mottershead, Lisa Craig, Mila Pavluk, Ed Mohacsy, and Glen West to initiate the process.

- **Responsibility**: Digital Communications Lead
    - **Supporting Player**: Senior Manager, Marketing and Communications

Customize and distribute **an alert to Facebook and alert to Twitter** announcing the de-energization of the grid, anticipated re-energization timeframe, CRC locations/hours and safety precautions to take while without energy.

- **Responsibility**: Digital Communications Lead
    - **Supporting Player**: Senior Manager, Marketing and Communications

CRC Communications – the Emergency Services Coordinator should coordinate with the Program Manager, External Communications and CSRs to provide at least two customer communications liaisons are at each CRC to provide information and address customer concerns.

The Emergency Services Coordinator will be responsible for tracking customer and community interactions at the CRCs and ensuring information is shared with the Program Manager, External Communications so external messages can be adjusted in real-time to address common concerns.

- **Responsibility**: Emergency Services Coordinator

At this stage, Liberty should continue the tactics outlined in the *Ongoing De-Energization Outreach* section every 24 hours until nearing power restoration. Visit the "Event Concluded" section of the playbook to know when to activate new communications.

Ongoing De-Energization Outreach – keep audiences informed about the de-energization event, including changes in weather forecasts and responses by public safety partners, first responders, critical facilities, stakeholders, etc. **Tactics included in this category must be done on a daily basis for the duration of the PSPS event**

PSPS Steering Committee and Reax Engineering/Operations/Control and Dispatch meet (between 6:30-7:30 a.m.) to discuss the implementation of the PSPS event, including the factors that warrant continued de-energization, coordination with public safety partners and first responders, confirmed number of impacted customers and next steps. Provide regular updates to this audience, as warranted and no less frequently than every eight hours. PSPS Steering Committee members – West Region President; California President; VP of Operations; Director, Customer Experience; Director, Operations; Senior Manager, Wildfire Prevention; Legal; and Rates and Regulatory Affairs.

- **Responsibility**: VP of Operations

Customize and distribute **an alert to the PSPS Team** notifying the group of current conditions, including the factors that continue to warrant de-energization, the anticipated restoration time, number of impacted customers and next steps.

- Responsibility: VP of Operations

[7 AM] **Complete and submit PSPS Notification Form** detailing the active PSPS event, including the factors that may warrant de-energization, the anticipated time of de-energization and restoration, link to GIS data, anticipated number of impacted customers (total and medical baseline), impacted counties, planned outreach and next steps. Call California State Warning Center at 916-845-8911 to confirm receipt.

- **Responsibility**: Senior Manager, Wildfire Prevention

Customize and distribute **an email to Human Resources, Customer Service, Control and Dispatch and Operations** to confirm staffing for the PSPS event. Detail the current conditions of the PSPS event, including anticipated length of the de-energization event, number of impacted customers and next steps. Email Blaine Ladd.

- **Responsibility**: VP of Operations

Customize and distribute updated **talking points to the CSRs** in the local offices and New Hampshire, the Emergency Services Coordinator and field staff who may be approached by customers or members of the general public.

- **Responsibility**: Senior Manager, Marketing and Communications

Customize and distribute **an employee email** updating weather conditions warranting continued de-energization, the anticipated restoration time, number of impacted customers and next steps. Include CSR talking points if applicable.

- **Responsibility**: Senior Manager, Marketing and Communications

Customize and **distribute a media advisory** to local media outlets. Provide a minimum of two hours' notice to scheduled event to allow travel time from Sacramento and Reno markets.

- **Responsibility**: Program Manager, External Communications

[1 p.m.] Host a public safety partner and critical facilities webinar detailing the active PSPS event, including the factors that warrant de-energization, coordination with public safety partners and first responders, available resources and next steps.

- **Responsibility**: Senior Manager, Wildfire Prevention
    - **Supporting Player**: VP of Operations, Emergency Services Coordinator

[2 p.m.] Host a customer webinar detailing the active PSPS event, including the factors that warrant de-energization, coordination with public safety partners and first responders, available resources and next steps.

- **Responsibility**: Senior Manager, Wildfire Prevention
    - **Supporting Player**: VP of Operations, Emergency Services Coordinator

Update the microsite announcing changes/updates to the de-energization event or CRC locations/hours.

- **Responsibility**: Digital Communications Lead
    - **Supporting Player**: Senior Manager, Marketing and Communications

Customize and **distribute an alert to Facebook and alert to Twitter** announcing changes/updates to the de-energization event, CRC locations/hours and continued safety precautions to take while without power.

- **Responsibility**: Digital Communications Lead
    - **Supporting Player**: Senior Manager, Marketing and Communications

Customize and distribute an **email to the CPUC** detailing the time of de-energization, anticipated length of the PSPS, coordination with public safety partners and first responders and next steps.

- **Responsibility**: Regulatory Affairs

[3 p.m.] **Complete and submit PSPS Notification Form** detailing the active PSPS event, including the factors that may warrant de-energization, the anticipated time of de-energization and restoration, link to GIS data, anticipated number of impacted customers (total and medical baseline), impacted counties, planned outreach and next steps. Call California State Warning Center at 916-845-8911 to confirm receipt.

- **Responsibility**: Regulatory Affairs

Host a **PSPS State Executive Briefing** at 1600 (4 p.m.) every day until the conclusion of the de-energization event.

- **Responsibility**: Regulatory Affairs
    - **Supporting Players**: VP of Operations and Senior Manager, Wildfire Prevention

Confirm record of all actions during Stage 3 (time of de-energization event) of the de-energization event.

- **Responsibility**: Administrative Officer
    - **Supporting Players**: VP of Operations; Senior Manager, Wildfire Prevention; Senior Manager, Marketing and Communications; Regulatory Affairs; Program Manager, External Communications; Emergency Services Coordinator; and Digital Communications Lead

REQUIRED: log the date, time and recording of the press conference to include in post-PSPS report to CPUC.

At this stage, Liberty should continue the tactics outlined in the *Post De-Energization Outreach* phase until nearing power restoration. Visit the "Restored Power" section of the playbook to know when to activate new communications.

Stage 3 – Implemented PSPS Checklist

Upon completion of each tactic listed in the implemented PSPS section, please check off the respective box below.

VP OF OPERATIONS

☐ Participate in PSPS Steering Committee and Reax Engineering/Operations/Control and Dispatch meeting
☐ Alert PSPS Team
☐ Email HR, Customer Service, Control and Dispatch and Operations to prepare staff needs

REGULATORY AFFAIRS

☐ Email to CPUC
☐ Host a PSPS State Executive Briefing (1600/4 PM)
☐ Submit PSPS Notification form [0700 and 1500 hours, or whenever there is a major change in the event]

DIRECTOR, CONTROL AND DISPATCH

☐ Email customer list

PROGRAM MANAGER, EXTERNAL COMMUNICATIONS

☐ Email and Everbridge alert to public safety partners and critical facilities
☐ Everbridge alert to all impacted customers
☐ Press release
☐ Distribute radio PSA
☐ Distribute Changeable Message Sign (CMS)
☐ Host press conference detailing active PSPS

SENIOR MANAGER, WILDFIRE PREVENTION

☐ Host informational call with public safety partners and critical facilities
☐ Host informational call with customers

SENIOR MANAGER, MARKETING AND COMMUNICATIONS

☐ Distribute employee email
☐ Distribute talking points to the CSRs

DIGITAL COMMUNICATIONS LEAD

☐ Update microsite
☐ Facebook alert am
☐ Twitter alert am
☐ Update microsite
☐ Facebook alert pm
☐ Twitter alert pm

ADMINISTRATIVE OFFICER

☐ Distribute the sequence of events tracker
☐ Complete the IC Action plan for the 6:30 am meeting
☐ Email the IC Action Plan to the 8:00 am EOC group
☐ Back up sequence of events tracker

SENIOR MANAGER, CUSTOMER SOLUTIONS AND MANAGER III - ELECTRIC, BUSINESS AND COMMUNITY DEVELOPMENT

☐ Distribute email to CBOs
☐ Distribute alert to key customers

DIRECTOR, GOVERNMENT AFFAIRS

☐ Distribute email to elected officials

EMERGENCY SERVICES COORDINATOR

☐ Update CRC staff on conditions
☐ Track customer interactions at CRC

Stage 4 – Re-energization Initiated

POWER RESTORATION BEGINS

Overview

The directions and actions included herein should only be activated when a de-energization event is ending. The label of **"restoration initiated"** would be applicable when the factors that initiated the PSPS subside and inspection of the electric grid begins.

Restoration Initiated Assumptions

The following assumptions describe a typical environment in which communications for a **restoration** would be activated in whole or in part:

- Weather conditions that warranted a PSPS have subsided for at least **one hour,** and forecasts do not indicate the continued need for de-energization
- The grid has been inspected and cleared for re-energization

Before Activating ***Restored Power*** Communications

1. Confirm geographic area/ portion of the grid that experienced the de-energization event
2. 2. Confirm number of customers who experienced de-energization (segment customers by commercial, residential, medical baseline and AFN)
3. 3. Identify areas where infrastructure-caused wildfire risk was prevented due to PSPS

Communications Timeline and Tactics

In the event of **restored power,** Liberty may activate the following methods of communication over the period of time it takes to inspect the grid and successfully restore power:

AM ACTIVITIES – Members of the Liberty PSPS Team should be prepared to complete these actions between the hours of 6 a.m. and 12 p.m.

PSPS Steering Committee and Reax Engineering/Operations/Control and Dispatch meet (between 6:30 – 7:30 a.m.) to discuss the conclusion of the PSPS event, including grid inspection and anticipated restoration of power. PSPS Steering Committee members – West Region President; California President; VP of Operations; Director, Customer Experience; Director, Operations; Senior Manager, Wildfire Prevention; GIS, PIO, Admin Officer, Legal; and Rates and Regulatory Affairs.

- **Responsibility**: VP of Operations

Customize and distribute **an alert to the PSPS Team** notifying the group of improving conditions and next steps, detailing the grid inspection process and anticipated time of power restoration.

- **Responsibility**: VP of Operations

Develop and distribute **an impacted customers list** to the PSPS Team.

- **Responsibility:** Director, Electric Control and Dispatch

Customize and distribute **an email to Human Resources, Customer Service, Control and Dispatch and Operations** to confirm staffing for the PSPS event. Detail the current conditions of the PSPS event, including anticipated time of restoration, number of still impacted customers and next steps. Email Blaine Ladd.

- **Responsibility**: VP of Operations

Customize and distribute **updated talking points** to the CSRs in the local offices and New Hampshire, the Emergency Services Coordinator and field staff who may be approached by customers or members of the general public.

- **Responsibility**: Senior Manager, Marketing and Communications

Customize and distribute **an employee email** notifying them of improved conditions and restoration next steps.

- **Responsibility**: Senior Manager, Marketing and Communications

[7 AM] **Complete and submit PSPS Notification Form** detailing the initiation of restoration activities, link to GIS data, anticipated number of impacted customers (total and medical baseline), impacted counties, planned outreach and next steps.

- **Responsibility**: Regulatory Affairs

Customize and distribute **an email to the CPUC** detailing the grid inspection process and anticipated time of power restoration.

- **Responsibility*:*** Regulatory Affairs

Customize and distribute **an Everbridge alert to public safety partners and critical facilities** within and immediately adjacent to the de-energization zone detailing the grid inspection process and anticipated time of power restoration.

- **Responsibility**: Program Manager, External Communications

- **Supporting Player**: Senior Manager, Wildfire Prevention

Customize and distribute **an email to elected officials** within and immediately adjacent to the de-energization zone detailing the grid inspection process and anticipated time of power restoration.

- **Responsibility**: Director, Government Affairs
  - **Supporting Player**: Program Manager, External Communications

Customize and distribute **a press release** to local media outlets detailing the grid inspection process and anticipated time of power restoration.

- **Responsibility**: Program Manager, External Communications

Customize and distribute **a PSA** to local radio outlets detailing the grid inspection process and anticipated time of power restoration.

- **Responsibility**: Program Manager, External Communications

Customize and post a **web alert** to the appropriate community pages on the website detailing the grid inspection process and anticipated time of power restoration.

- **Responsibility**: Digital Communications Lead
  - **Supporting Player**: Senior Manager, Marketing and Communications

Update the microsite announcing changes/updates to the re-energization event. Contact Brian Mottershead, Lisa Craig, Mila Pavluk, Ed Mohacsy, and Glen West to initiate the process of taking down the microsite.

- **Responsibility**: Digital Communications Lead

Customize and post an **alert to Facebook and Twitter** detailing the grid inspection process and anticipated time of power restoration.

- **Responsibility**: Digital Communications Lead
  - **Supporting Player**: Senior Manager, Marketing and Communications

REPAIRS NEEDED NOTIFICATION – Members of the Liberty PSPS Team should be prepared to complete these actions **if** restoration of power is delayed due to damaged infrastructure.

Complete and submit PSPS Notification Form detailing the damage to the grid, what caused it, the needed repairs, new anticipated time of power restoration, link to GIS data, anticipated

number of impacted customers (total and medical baseline), impacted counties, planned outreach and next steps.

- **Responsibility**: Regulatory Affairs

Customize and distribute an **email to the CPUC** detailing the damage to the grid, what caused it, the needed repairs and new anticipated time of power restoration.

- **Responsibility:** Regulatory Affairs

Customize and distribute **talking points to the CSRs** in the local offices and New Hampshire, the Emergency Services Coordinator and field staff who may be approached by customers or members of the general public.

- **Responsibility**: Senior Manager, Marketing and Communications

Customize and distribute **an email and Everbridge Alert to public safety partners and critical facilities** within and immediately adjacent to the de-energization zone detailing the damage to the grid, what caused it, the needed repairs and new anticipated time of power restoration.

- **Responsibility**: Program Manager, External Communications
    - **Supporting Player**: Senior Manager, Wildfire Prevention

Customize and distribute **an email to elected officials** within and immediately adjacent to the de-energization zone detailing the damage to the grid, what caused it, the needed repairs and new anticipated time of power restoration.

- **Responsibility**: Government Affairs
    - **Supporting Player**: Program Manager, External Communications

Customize and distribute **an alert to all impacted customers** via the Everbridge alert system (text, email and voice message) announcing the damage to the grid, the repairs needed and new anticipated time of restoration.

- **Responsibility**: Program Manager, External Communications

SUBTASKS

Collaborate with the CSRs to **directly call known medical baseline and AFN customers** who did not acknowledge receipt of the Everbridge alert.

- **Responsibility**: Manager, Customer Care and Manager II – WMP, Business and Community Development

For those who remain unreachable, customize and distribute **door hangers** to all known medical baseline and AFN customers who did not acknowledge receipt of the Everbridge alert.

- **Responsibility**: Manager, Customer Care and Manager II – WMP, Business and Community Development

Customize and post a **web alert** to the appropriate community pages on the website detailing the damage to the grid, what caused it, the needed repairs and new anticipated time of power restoration.

- **Responsibility**: Digital Communications Lead
  - **Supporting Player**: Senior Manager, Marketing and Communications

Customize and post an **alert to Facebook and Twitter** detailing the damage to the grid, what caused it, the needed repairs and new anticipated time of power restoration.

- **Responsibility**: Digital Communications Lead
  - **Supporting Player**: Senior Manager, Marketing and Communications

Confirm record of all actions during Stage 4 (Re-energization initiated) of the de-energization event.

- **Responsibility**: Administrative Officer
  - **Supporting Players**: VP of Operations; Senior Manager, Wildfire Prevention; Senior Manager, Marketing and Communications; Regulatory Affairs; Program Manager, External Communications; Emergency Services Coordinator; and Digital Communications Lead

REQUIRED: log the date, time and length of call to include in post-PSPS report to CPUC. If call is done via WebEx, please record and log the audio/video file.

Stage 4 – Restoration Initiated Checklist

Upon completion of each tactic listed in the restored power section, please check off the respective box below.

VP OF OPERATIONS

☐ Participate in PSPS Steering Committee and Reax Engineering/Operations/Control and Dispatch meeting
☐ Alert PSPS Team
☐ Email HR, Customer Service, Control and Dispatch and Operations to prepare staff needs

REGULATORY AFFAIRS

☐ Email to CPUC
☐ Submit PSPS Notification form [0700 and 1500 hours, or whenever there is a major change in the event]

DIRECTOR, CONTROL AND DISPATCH

☐ Email customer list

PROGRAM MANAGER, EXTERNAL COMMUNICATIONS

☐ Email and Everbridge alert to public safety partners and critical facilities
☐ Press release
☐ Distribute radio PSA

Repairs Needed

☐ Everbridge alert to public safety partners and critical facilities

SENIOR MANAGER, MARKETING AND COMMUNICATIONS

☐ Distribute employee email
☐ Distribute talking points to the CSRs

DIGITAL COMMUNICATIONS LEAD

☐ Update microsite
☐ Facebook alert
☐ Twitter alert

ADMINISTRATIVE OFFICER

☐ Distribute the sequence of events tracker
☐ Complete the IC Action plan for the 6:30 am meeting
☐ Email the IC Action Plan to the 8:00 am EOC group
☐ Back up sequence of events tracker

SENIOR MANAGER, CUSTOMER SOLUTIONS AND MANAGER III - ELECTRIC, BUSINESS AND COMMUNITY DEVELOPMENT

☐ Distribute alert to key commercial customers
☐ Distribute email to CBOs

Stage 5 – Event Concluded
PSPS EVENT ENDS

Overview
The directions and actions included herein should only be activated when a de-energization event has ended and restoration has been complete. The label of **"event concluded"** would be applicable when the inspection of the electric grid is complete and power is restored.

Event Concluded Assumptions
The following assumptions describe a typical environment in which communications for **event concluded** would be activated in whole or in part:

- The grid has been inspected and cleared for re-energization

Before Activating ***Event Concluded*** Communications

1. Confirm geographic area/ portion of the grid that experienced the de-energization event
2. Confirm number of customers who experienced de-energization (segment customers by commercial, residential, medical baseline and AFN)
3. Identify areas where infrastructure-caused wildfire risk was prevented due to PSPS

Communications Timeline and Tactics
In the event of **event concluded,** Liberty may activate the following methods of communication over the period of time it takes to successfully restore power:

AM ACTIVITIES – Members of the Liberty PSPS Team should be prepared to complete these actions between the hours of 6 a.m. and 12 p.m., or as soon as the inspection of the grid is complete, and power is now restored.

PSPS Steering Committee and Reax Engineering/Operations/Control and Dispatch meet (between 6:30 – 7:30 AM) to discuss the restoration of power. PSPS Steering Committee members – West Region President; California President; VP of Operations; Director, Customer Experience; Director, Operations; Senior Manager, Wildfire Prevention; GIS, PIO, Admin Officer, Legal; and Rates and Regulatory Affairs.

- **Responsibility**: VP of Operations

Customize and distribute an **email to the PSPS Steering Committee** announcing the restoration of power. PSPS Steering Committee members – West Region President; California President; VP

of Operations; Director, Customer Experience; Director, Operations; Senior Manager, Wildfire Prevention; Legal; and Rates and Regulatory Affairs.

- **Responsibility*:*** VP of Operations

Customize and distribute **an employee email** announcing the restoration of power.

- **Responsibility*:*** Senior Manager, Marketing and Communications

Alert It to begin process to remove temporary landing page for enterprise and temporary PSPS landing page.

- **Responsibility*:*** Digital Communications Lead
    - **Supporting Player:** Senior Manager, Marketing and Communications

Customize and distribute **talking points to the CSRs** in the local offices and New Hampshire, the Emergency Services Coordinator and to field staff who may be approached by customers or members of the general public.

- **Responsibility**: Senior Manager, Marketing and Communications

[AT TIME OF RESTORATION] **Complete and submit PSPS Notification Form** detailing the initiation of restoration activities, link to GIS data, anticipated number of impacted customers (total and medical baseline), impacted counties, planned outreach and next steps.

- **Responsibility**: Regulatory Affairs

Customize and distribute **an email to the CPUC** announcing the restoration of power and anticipated submission of the post-PSPS report. Notification of this audience must occur one hour before re-energization.

- **Responsibility**: Regulatory Affairs

Customize and distribute **an Everbridge alert to public safety partners and critical facilities** within and immediately adjacent to the de-energization zone announcing the restoration of power. Notification of this audience must occur one hour before re-energization.

- **Responsibility**: Program Manager, External Communications
    - **Supporting Player**: Senior Manager, Wildfire Prevention

Customize and distribute **an email to elected officials** within and immediately adjacent to the de-energization zone announcing the restoration of power. Notification of this audience must occur one hour before re-energization.

- **Responsibility**: Director, Government Affairs
    - **Supporting Player**: Program Manager, External Communications

Customize and distribute **an alert to impacted customers** via the Everbridge alert system (text, email and voice message) announcing the restoration of power.

- **Responsibility**: Program Manager, External Communications

SUBTASKS

Collaborate with the CSRs to **directly call known medical baseline and AFN customers** who did not acknowledge receipt of the Everbridge alert.

- **Responsibility**: Manager, Customer Care and Manager II – WMP, Business and Community Development

For those who remain unreachable, customize and distribute **door hangers** to known medical baseline and AFN customers who did not acknowledge receipt of the Everbridge alert.

- **Responsibility**: Manager, Customer Care and Manager II – WMP, Business and Community Development

Customize and distribute an alert to key customers including commercial accounts, cities, towns, schools, and chambers via personal call and/or email the potential need to de-energize the grid.

- **Responsibility:** Senior Manager, Customer Solutions and Manager III – Electric, Business and Community Development
    - **Supporting Player:** Program Manager, External Communications
    - **Supporting Player:** Director, Government Affairs to make sure there are no duplications in contacts

Customize and distribute **a press release** to local media outlets announcing the restoration of power.

- **Responsibility**: Program Manager, External Communications

Customize and distribute **a PSA** to local radio outlets announcing the restoration of power.

- **Responsibility**: Program Manager, External Communications

Customize and distribute **a CMS template** to Caltrans announcing restoration of power. Contact rafiq.al-khalili@dot.ca.gov with requested message.

- **Responsibility**: Program Manager, External Communications

Customize and post **a web alert** to the appropriate community pages on the website announcing the restoration of power and reminding customers to use energy sparingly to prevent a circuit surge. Include information regarding closing of CRCs (day/hour or closure).

- **Responsibility**: Digital Communications Lead
    - **Supporting Player**: Senior Manager, Marketing and Communications

Customize and post **an alert to Facebook and Twitter** announcing the restoration of power and reminding customers to use energy sparingly to prevent a circuit surge. Include information regarding closing of CRCs (day/hour or closure).

- **Responsibility**: Digital Communications Lead
    - **Supporting Player**: Senior Manager, Marketing and Communications

Host a **PSPS State Executive Briefing** at 1600 (4 p.m.) every day until the conclusion of the de-energization event.

- **Responsibility**: Regulatory Affairs
    - **Supporting Players**: VP of Operations and Senior Manager, Wildfire Prevention

Post Power Restoration Recap – provide a recap of the de-energization event and highlight instances of damaged infrastructure that would have sparked a wildfire if a PSPS had not been implemented. Activities include:

Customize and distribute a **media advisory to local media outlets**. Provide a minimum of **two hours' notice** to scheduled event to allow travel time from Sacramento and Reno markets.

- **Responsibility*:*** Program Manager, External Communications

Customize and distribute **a post-PSPS event survey** to impacted customers to document public comments on communication and response.

- **Responsibility**: Program Manager, External Communications

Confirm record of all actions during Stage 5 (conclusion of event) of the de-energization event.

- **Responsibility**: Administrative Officer

- **Supporting Players**: VP of Operations; Senior Manager, Wildfire Prevention; Senior Manager, Marketing and Communications; Regulatory Affairs; Program Manager, External Communications; Emergency Services Coordinator; and Digital Communications Lead

REQUIRED: log the date, time and length of call to include in post-PSPS report to CPUC. If call is done via WebEx, please record and log the audio/video file.

Stage 5 – Event Concluded Checklist

Upon completion of each tactic listed in the restored power section, please check off the respective box below.

VP OF OPERATIONS

☐ Participate in PSPS Steering Committee and Reax Engineering/Operations/Control and Dispatch meeting

☐ Alert PSPS Team

REGULATORY AFFAIRS

☐ Email to CPUC

☐ Submit PSPS Notification form [0700 and 1500 hours, or whenever there is a major change in the event]

PROGRAM MANAGER, EXTERNAL COMMUNICATIONS

☐ Email and Everbridge alert to public safety partners and critical facilities

☐ Email to all impacted customers

☐ Press release

☐ Distribute radio PSA

☐ Distribute Changeable Message Sign (CMS) – Concluded

SENIOR MANAGER, MARKETING AND COMMUNICATIONS

☐ Distribute employee email

☐ Distribute talking points to the CSRs

DIGITAL COMMUNICATIONS LEAD

☐ Alert IT to begin removing microsite

☐ Facebook alert

☐ Twitter alert

ADMINISTRATIVE OFFICER

☐ Distribute the sequence of events tracker

☐ Back up sequence of events tracker

SENIOR MANAGER, CUSTOMER SOLUTIONS AND MANAGER III - ELECTRIC, BUSINESS AND COMMUNITY DEVELOPMENT

☐ Distribute alert to key commercial customers

☐ Distribute email to CBOs

☐ Call all medical baseline and AFN customers

CANCELED PSPS

OVERVIEW

The directions and actions included herein should only be activated when it is determined that a de-energization event is no longer warranted to mitigate fire risk. The label of "canceled PSPS" would be applicable when Liberty resends a potential PSPS warning.

RESTORED POWER ASSUMPTIONS

The following assumptions describe a typical environment in which communications for a canceled PSPS would be activated in whole or in part:

- Weather/fire conditions have fallen below thresholds
- Forecasts indicate no, or a very unlikely, resurgence in fire weather conditions

Before Activating *CANCELED PSPS* Communications

Confirm which geographic areas/portions of the grid are no longer at risk for de-energization

Identify circuits that are no longer at risk for de-energization

Identify number of customers no longer at risk for de-energization (segment by commercial, residential, medical baseline and AFN)

Identify critical facilities no longer at risk for de-energization

Communications Timeline and Tactics

In the event of **a canceled PSPS,** Liberty may activate the following methods of communication over the course of a 24-hour period:

ACTIVITIES – Members of the Liberty PSPS Team should be prepared to complete these actions as soon as confirmation of the cancellation is provided.

PSPS Steering Committee and Reax Engineering/Operations/Control and Dispatch meet (between 6:30 – 7:30 a.m.) to discuss the cancelation of the PSPS event. PSPS Steering Committee members – West Region President; California President; VP of Operations; Director, Customer Experience; Director, Operations; Senior Manager, Wildfire Prevention; GIS, PIO, Admin Officer, Legal; and Rates and Regulatory Affairs.

- **Responsibility**: VP of Operations

Customize and distribute **an alert to the PSPS Team** notifying the group of improving conditions and next steps.

- **Responsibility**: VP of Operations

Customize and distribute **an employee email** notifying the group of improving conditions and next steps.

- **Responsibility*:*** Senior Manager, Marketing and Communications

Customize and distribute **an email to Human Resources, Customer Service, Control and Dispatch and Operations** to alert support staff of the canceled PSPS event

- **Responsibility**: VP of Operations

Complete and submit PSPS Notification Form detailing the cancellation of the PSPS event.

- **Responsibility**: Regulatory Affairs

Customize and distribute **an email to the CPUC** announcing the cancellation of PSPS event. Notification of this audience must occur two hours before re-energization.

- **Responsibility**: Regulatory Affairs

Customize and distribute **an email and Everbridge alert to the public safety partners and critical facilities** announcing the cancellation of the potential PSPS event and why it is no longer necessary.

- **Responsibility**: Program Manager, External Communications
    - **Supporting Player**: Senior Manager, Wildfire Prevention

Customize and distribute **an email to elected officials** announcing the cancellation of the potential PSPS event and why it is no longer necessary.

- **Responsibility**: Government Affairs
    - **Supporting Player**: Program Manager, External Communications

Customize and distribute **an alert to all impacted customers** via the Everbridge alert system (text, email and voice message) announcing the cancellation of the potential PSPS event and why it is no longer necessary.

- **Responsibility**: Program Manager, External Communications

Customize and distribute an alert to key customers including commercial accounts, cities, towns, schools, and chambers via personal call and/or email the potential need to de-energize the grid.

- **Responsibility:** Senior Manager, Customer Solutions and Manager III – Electric, Business and Community Development
    - **Supporting Player:** Program Manager, External Communications
    - **Supporting Player:** Director, Government Affairs to make sure there are no duplications in contacts

Customize and distribute **a web alert** to the appropriate community pages on the website announcing the cancellation of the potential PSPS event and why it is no longer necessary.

- **Responsibility**: Digital Communications Lead
    - **Supporting Player**: Senior Manager, Marketing and Communications

Update the microsite announcing the cancellation of the potential PSPS event and why it is no longer necessary. Instruct them to remove the temporary landing pages and return the website to normal. Contact Brian Mottershead, Lisa Craig, Mila Pavluk, Ed Mohacsy, and Glen West to initiate the process of taking down the microsite.

- **Responsibility**: Digital Communications Lead
    - **Supporting Player**: Senior Manager, Marketing and Communications

Customize and distribute **an alert to Facebook and Twitter** announcing the cancellation of the potential PSPS event and why it is no longer necessary.

- **Responsibility**: Digital Communications Lead
    - **Supporting Player**: Senior Manager, Marketing and Communications

Customize and distribute **a press release** to local media outlets announcing the cancellation of the potential PSPS event and why it is no longer necessary.

- **Responsibility**: Program Manager, External Communications

Canceled PSPS

Upon completion of each tactic listed in the canceled section, please check off the respective box below.

VP OF OPERATIONS

☐ Participate in PSPS Steering Committee and Reax Engineering/Operations/Control and Dispatch meeting
☐ Alert PSPS Team
☐ Email HR, Customer Service, Control and Dispatch and Operations

REGULATORY AFFAIRS

☐ Email to CPUC

PROGRAM MANAGER, EXTERNAL COMMUNICATIONS

☐ Email and Everbridge alert to public safety partners and critical facilities
☐ Email to all impacted customers
☐ Press release

SENIOR MANAGER, WILDFIRE PREVENTION

☐ Submit PSPS Notification form [0700 and 1500 hours, or whenever there is a major change in the event]

SENIOR MANAGER, MARKETING AND COMMUNICATIONS

☐ Distribute employee email

DIGITAL COMMUNICATIONS LEAD

☐ Web alert
☐ Update microsite
☐ Facebook alert
☐ Twitter alert

ADMINISTRATIVE OFFICER

☐ Confirm all parties have recorded action in shared document

SENIOR MANAGER, CUSTOMER SOLUTIONS AND MANAGER III - ELECTRIC, BUSINESS AND COMMUNITY DEVELOPMENT

☐ Distribute alert to key commercial customers

PSOM Event

A Public Safety Outage Management (PSOM) event is ***not*** a PSPS event. The execution of a PSOM event is determined solely by Liberty's power provider, NV Energy, not by Liberty. During a PSOM event, NV Energy shuts off power in one or more of its extreme or elevated fire-risk zones when certain environmental conditions are met, and an evaluation of risk is done with guidance from local emergency management teams and other stakeholders.

To the extent possible, Liberty will follow PSPS protocols regarding communications if an NV Energy PSOM event impacts Liberty's power lines and customers. The directions and actions included herein should only be activated when a de-energization event is issued by NV Energy. The label of **"PSOM Event"** would be applicable when NV Energy publicly announces plans for a de-energization event that disrupts Liberty service.

PSOM Assumptions
The following assumptions describe a typical environment in which communications for a **PSOM Event** would be activated in whole or in part:

- Energy communicates to Liberty that NV Energy will execute a PSOM event

Before Activating *PSOM* Communications
Coordinate with Operations to:
1. Identify geographic area/ portion of the grid at risk for de-energization
2. Identify circuits at risk for de-energization
3. Identify number of customers at risk for de-energization (segment customers by commercial, residential, medical baseline and AFN)
4. Identify critical facilities at risk of de-energization
5. Identify approximate time of de-energization event
6. Develop map highlighting the de-energization zone
7. Confirm locations of Community Resource Centers (CRC) with Operations team

NV ENERGY PSOM CONTACT:
NV ENERGY OPERATIONS CONTACT:

Communications Timeline and Tactics
In the event of an **NV Energy PSOM, to the extent possible,** Liberty may activate the following methods of communication over the duration of the de-energization event:

<u>Tactics included in this category must be done on a daily basis for the duration of the PSOM event</u>

Customize and distribute **an alert to the PSPS Team** notifying the group of NV Energy's PSOM event.

- **Responsibility**: VP of Operations

[7 AM/OR AS SOON AS NV ENERGY CONFIRMS POTENTIAL PSOM] Complete and submit PSPS Notification Form detailing the PSOM event. Call California State Warning Center at 916-845-8911 to confirm receipt.

- **Responsibility**: Senior Manager, Wildfire Prevention

Customize and distribute **an email to Human Resources, Customer Service, Dispatch and Operations** to confirm staffing for the PSOM event. Detail the current conditions of the PSOM. Email Blaine Ladd.

- **Responsibility**: VP of Operations

Customize and distribute **updated talking points** to the CSRs in the local offices and New Hampshire, the Emergency Services Coordinator and all field staff who may be approached by customers or members of the general public.

- **Responsibility**: Senior Manager, Marketing and Communications

Customize and distribute **an email and Everbridge alert to public safety partners and critical facilities** within and immediately adjacent to the de-energization zone. **Linking to NV Energy communications on the PSOM event whenever possible and identify an NV Energy contact to provide to public safety partners.**

- **Responsibility**: Senior Manager, Wildfire Prevention
    - **Supporting Player**: Program Manager, External Communications

Customize and distribute **an to elected officials** within and immediately adjacent to the de-energization zone detailing the factors that warrant de-energization, anticipated number of impacted customers (with emphasis on medical baseline and AFN customers), anticipated list of impacted critical facilities, CRC plans and next steps. **Link to NV Energy communications on the PSOM event whenever possible and identify an NV Energy contact to provide to public safety partners.**

- **Responsibility**: Government Affairs
    - **Supporting Player**: Program Manager, External Communications

Customize and distribute **an email to CBOs** within and immediately adjacent to the de-energization zone detailing the factors that may warrant de-energization, anticipated number of impacted customers, CRC plans and resources to help support sensitive customers. **Link to NV Energy communications on the PSOM event whenever possible.**

- **Responsibility**: Senior Manager, Customer Solutions

Customize and distribute **an alert to all potentially impacted customers** via the Everbridge alert system (text, email and voice message) announcing the PSOM de-energization event and encouraging customers to take safety precautions. Include details regarding plans to activate CRCs throughout the service area. **Link to NV Energy communications on the PSOM event whenever possible.**

- **Responsibility**: Program Manager, External Communications

Customize and distribute **a press release** to local media outlets announcing the imminent de-energization event and encouraging customers to take safety precautions. Include information regarding plans to activate CRCs throughout the service area.

- **Responsibility**: Program Manager, External Communications

Customize and distribute **a web alert** to the appropriate community pages on the website announcing the PSOM de-energization event and encouraging customers to take safety precautions. Include information regarding any plans to activate CRCs in the service area. **Link to NV Energy messaging on the PSOM event whenever possible and link back to the utility's digital resources.**

- **Responsibility**: Digital Communications Lead
    - **Supporting Player**: Senior Manager, Marketing and Communications

Customize and distribute **an alert to Facebook and Twitter** announcing the imminent de-energization event and encouraging customers to take safety precautions. Include information regarding plans to activate CRCs in the service area. **Link to NV Energy messaging on the PSOM event whenever possible and link back to the utility's digital resources.**

- **Responsibility**: Digital Communications Lead
    - **Supporting Player**: Senior Manager, Marketing and Communications

[3 PM] Complete and submit PSPS Notification Form detailing the PSOM event. Call California State Warning Center at 916-845-8911 to confirm receipt.

- **Responsibility**: Senior Manager, Wildfire Prevention

PSOM Checklist

Upon completion of each tactic listed in the PSOM section, please check off the respective box below.

VP OF OPERATIONS

☐ Alert PSPS Team

☐ Email HR, Customer Service, Dispatch and Operations

REGULATORY AFFAIRS

☐ Email to CPUC

☐ Host a PSPS State Executive Briefing (1600/4 PM)

PROGRAM MANAGER, EXTERNAL COMMUNICATIONS

☐ Email and Everbridge alert to public safety partners and critical facilities

☐ Email to all impacted customers

☐ Press release

SENIOR MANAGER, WILDFIRE PREVENTION

☐ Submit PSPS Notification form [0700 and 1500 hours, or whenever there is a major change in the event]

SENIOR MANAGER, MARKETING AND COMMUNICATIONS

☐ Distribute employee email

DIGITAL COMMUNICATIONS LEAD

☐ Web alert

☐ Update microsite

☐ Facebook alert

☐ Twitter alert

ADMINISTRATIVE OFFICER

☐ Confirm all parties have recorded action in shared document

SENIOR MANAGER, CUSTOMER SOLUTIONS AND MANAGER III - ELECTRIC, BUSINESS AND COMMUNITY DEVELOPMENT

☐ Distribute alert to key commercial customers

General Education

Overview
The directions and actions included herein should be activated throughout the year to educate customers and other key audiences about Liberty's wildfire mitigation efforts, what would happen during a PSPS and how to prepare.

Communications Timeline and Tactics
In an effort to effectively communicate its wildfire mitigation and PSPS preparation efforts, Liberty should adhere to the below general education schedule, and regularly develop fresh educational content across the below platforms:

	Daily	Weekly	Monthly	Bi-monthly	Quarterly
Social media		X			
Call-hold scripts	X				
Advertisements				X	
Bill inserts					X
Email					X
HOA articles/op-eds					X
Direct mail					X
Public meetings			X		
Stakeholder outreach					X
Public Safety Partner outreach					X
First Responder outreach					X
Critical Facilities outreach					X
CBO outreach					X

Ongoing Communications – To supplement formal outreach programs, Liberty shall customize and distribute WMP and PSPS-related educational materials in required languages through the following communications channels:

- Website
- Emails

- Community events
- Social media
- Printed materials
- Videos
- Bill inserts
- Radio advertisements

Responsibility: Program Manager, External Communications

Community Workshops – Liberty shall host a series of one-hour community workshops to provide information related to the Wildfire Mitigation Plan (WMP) and Public Safety Power Shutoff (PSPS) activities.

Workshops shall be conducted in the following areas: Portola, Loyalton, Coleville/Walker, Markleeville, Truckee/Glenshire, Kings Beach/Tahoe City, South Lake Tahoe.

- Customers shall be notified about these workshops via e-mail, social media and collaboration with CBOs and other community partners.
- When in-person workshops are not possible, community workshops shall be conducted virtually.

Responsibility: Program Manager, External Communications, Senior Manager, Wildfire Prevention, Senior Manager, Marketing and Communications and Administrative Officer

CBO Outreach – Liberty shall work with its CBOs to reach AFN customers throughout the service territory.

Keep current a toolkit to provide to CBOs: educational literature and articles translated into Spanish, Mandarin, Tagalog, Vietnamese, German, and French. The toolkit must also provide contact information so CBOs and AFN customers can reach out to Liberty with questions or to schedule presentations.

Responsibility: Program Manager, External Communications and Administrative Officer

PSPS Resources

Overview
The resources section includes the template outreach material referenced throughout the stages of the PSPS and general education sections. Template material is hyperlinked in its corresponding section of the playbook.

For the purpose of this section, material is cataloged by type rather than PSPS stage.

- *Letters and emails*
- *Press releases*
- *Everbridge alerts*
- *Talking points*
- *Web posts*
- *Social media*
- *Miscellaneous print collateral*

Utility	Liberty
Table No.	7.2
Date Modified	8/1/2022

Notes:
Transmission lines refer to all lines at or above 65kV, and distribution lines refer to all lines below 65kV.
Data from 2015 - 2021 should be actual numbers. 2022 and 2023 should be projected. In future submissions update projected numbers with actuals

Table 7.2: Key recent and projected drivers of ignitions

						Number of ignitions								Projected ignitions		
	Metric type	**#**	**Ignition driver**	**Line Type**	**HFTD tier**	**Are ignitions tracked for ignition driver? (yes / no)**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**Unit(s)**	**Comments**
x	1. Contact from object	1.a.i	Veg. contact	Distribution	Non-HFTD	Yes										# ignitions	
		1.a.ii	Veg. contact	Distribution	HFTD Zone 1	Yes										# ignitions	
		1.a.iii	Veg. contact	Distribution	HFTD Tier 2	Yes		1					1		1	# ignitions	
		1.a.iv	Veg. contact	Distribution	HFTD Tier 3	Yes										# ignitions	
		1.a.v	Veg. contact	Distribution	System	Yes										# ignitions	
		1.a.vi	Veg. contact	Transmission	Non-HFTD											# ignitions	
		1.a.vii	Veg. contact	Transmission	HFTD Zone 1											# ignitions	
		1.a.viii	Veg. contact	Transmission	HFTD Tier 2											# ignitions	
		1.a.ix	Veg. contact	Transmission	HFTD Tier 3											# ignitions	
		1.a.x	Veg. contact	Transmission	System											# ignitions	
		1.b.i	Animal contact	Distribution	Non-HFTD	Yes										# ignitions	
		1.b.ii	Animal contact	Distribution	HFTD Zone 1	Yes										# ignitions	
		1.b.iii	Animal contact	Distribution	HFTD Tier 2	Yes							2		1	# ignitions	
		1.b.iv	Animal contact	Distribution	HFTD Tier 3	Yes										# ignitions	
		1.b.v	Animal contact	Distribution	System	Yes										# ignitions	
		1.b.vi	Animal contact	Transmission	Non-HFTD											# ignitions	
		1.b.vii	Animal contact	Transmission	HFTD Zone 1											# ignitions	
		1.b.viii	Animal contact	Transmission	HFTD Tier 2											# ignitions	
		1.b.ix	Animal contact	Transmission	HFTD Tier 3											# ignitions	
		1.b.x	Animal contact	Transmission	System											# ignitions	
		1.c.i	Balloon contact	Distribution	Non-HFTD	Yes										# ignitions	
		1.c.ii	Balloon contact	Distribution	HFTD Zone 1	Yes										# ignitions	
		1.c.iii	Balloon contact	Distribution	HFTD Tier 2	Yes										# ignitions	
		1.c.iv	Balloon contact	Distribution	HFTD Tier 3	Yes										# ignitions	
		1.c.v	Balloon contact	Distribution	System	Yes										# ignitions	
		1.c.vi	Balloon contact	Transmission	Non-HFTD											# ignitions	
		1.c.vii	Balloon contact	Transmission	HFTD Zone 1											# ignitions	
		1.c.viii	Balloon contact	Transmission	HFTD Tier 2											# ignitions	
		1.c.ix	Balloon contact	Transmission	HFTD Tier 3											# ignitions	
		1.c.x	Balloon contact	Transmission	System											# ignitions	
		1.d.i	Vehicle contact	Distribution	Non-HFTD	Yes										# ignitions	
		1.d.ii	Vehicle contact	Distribution	HFTD Zone 1	Yes										# ignitions	
		1.d.iii	Vehicle contact	Distribution	HFTD Tier 2	Yes										# ignitions	
		1.d.iv	Vehicle contact	Distribution	HFTD Tier 3	Yes										# ignitions	
		1.d.v	Vehicle contact	Distribution	System	Yes										# ignitions	
		1.d.vi	Vehicle contact	Transmission	Non-HFTD											# ignitions	
		1.d.vii	Vehicle contact	Transmission	HFTD Zone 1											# ignitions	
		1.d.viii	Vehicle contact	Transmission	HFTD Tier 2											# ignitions	
		1.d.ix	Vehicle contact	Transmission	HFTD Tier 3											# ignitions	
		1.d.x	Vehicle contact	Transmission	System											# ignitions	
		1.e.i	Other contact from object	Distribution	Non-HFTD	Yes										# ignitions	
		1.e.ii	Other contact from object	Distribution	HFTD Zone 1	Yes										# ignitions	
		1.e.iii	Other contact from object	Distribution	HFTD Tier 2	Yes										# ignitions	
		1.e.iv	Other contact from object	Distribution	HFTD Tier 3	Yes										# ignitions	
		1.e.v	Other contact from object	Distribution	System	Yes										# ignitions	
		1.e.vi	Other contact from object	Transmission	Non-HFTD											# ignitions	
		1.e.vii	Other contact from object	Transmission	HFTD Zone 1											# ignitions	
		1.e.viii	Other contact from object	Transmission	HFTD Tier 2		1									# ignitions	
		1.e.ix	Other contact from object	Transmission	HFTD Tier 3											# ignitions	
		1.e.x	Other contact from object	Transmission	System											# ignitions	
	2. Equipment / facility failure	2.a.i	Capacitor bank damage or failure	Distribution	Non-HFTD	Yes										# ignitions	
		2.a.ii	Capacitor bank damage or failure	Distribution	HFTD Zone 1	Yes										# ignitions	
		2.a.iii	Capacitor bank damage or failure	Distribution	HFTD Tier 2	Yes										# ignitions	
		2.a.iv	Capacitor bank damage or failure	Distribution	HFTD Tier 3	Yes										# ignitions	
		2.a.v	Capacitor bank damage or failure	Distribution	System	Yes										# ignitions	
		2.a.vi	Capacitor bank damage or failure	Transmission	Non-HFTD											# ignitions	
		2.a.vii	Capacitor bank damage or failure	Transmission	HFTD Zone 1											# ignitions	
		2.a.viii	Capacitor bank damage or failure	Transmission	HFTD Tier 2											# ignitions	
		2.a.ix	Capacitor bank damage or failure	Transmission	HFTD Tier 3											# ignitions	
		2.a.x	Capacitor bank damage or failure	Transmission	System											# ignitions	
		2.b.i	Conductor damage or failure	Distribution	Non-HFTD	Yes										# ignitions	
		2.b.ii	Conductor damage or failure	Distribution	HFTD Zone 1	Yes										# ignitions	

	2.b.iii	Conductor damage or failure	Distribution	HFTD Tier 2	Yes	# ignitions		
	2.b.iv	Conductor damage or failure	Distribution	HFTD Tier 3	Yes	# ignitions		
	2.b.v	Conductor damage or failure	Distribution	System	Yes	# ignitions		
	2.b.vi	Conductor damage or failure	Transmission	Non-HFTD		# ignitions		
	2.b.vii	Conductor damage or failure	Transmission	HFTD Zone 1		# ignitions		
	2.b.viii	Conductor damage or failure	Transmission	HFTD Tier 2		# ignitions		
	2.b.ix	Conductor damage or failure	Transmission	HFTD Tier 3		# ignitions		
	2.b.x	Conductor damage or failure	Transmission	System		# ignitions		
	2.c.i	Fuse damage or failure	Distribution	Non-HFTD	Yes	# ignitions		
	2.c.ii	Fuse damage or failure	Distribution	HFTD Zone 1	Yes	# ignitions		
	2.c.iii	Fuse damage or failure	Distribution	HFTD Tier 2	Yes	# ignitions		
	2.c.iv	Fuse damage or failure	Distribution	HFTD Tier 3	Yes	# ignitions		
	2.c.v	Fuse damage or failure	Distribution	System	Yes	# ignitions		
	2.c.vi	Fuse damage or failure	Transmission	Non-HFTD		# ignitions		
	2.c.vii	Fuse damage or failure	Transmission	HFTD Zone 1		# ignitions		
	2.c.viii	Fuse damage or failure	Transmission	HFTD Tier 2		# ignitions		
	2.c.ix	Fuse damage or failure	Transmission	HFTD Tier 3		# ignitions		
	2.c.x	Fuse damage or failure	Transmission	System		# ignitions		
	2.d.i	Lightning arrestor damage or failure	Distribution	Non-HFTD	Yes	# ignitions		
	2.d.ii	Lightning arrestor damage or failure	Distribution	HFTD Zone 1	Yes	# ignitions		
	2.d.iii	Lightning arrestor damage or failure	Distribution	HFTD Tier 2	Yes	# ignitions		
	2.d.iv	Lightning arrestor damage or failure	Distribution	HFTD Tier 3	Yes	# ignitions		
	2.d.v	Lightning arrestor damage or failure	Distribution	System	Yes	# ignitions		
	2.d.vi	Lightning arrestor damage or failure	Transmission	Non-HFTD		# ignitions		
	2.d.vii	Lightning arrestor damage or failure	Transmission	HFTD Zone 1		# ignitions		
	2.d.viii	Lightning arrestor damage or failure	Transmission	HFTD Tier 2		# ignitions		
	2.d.ix	Lightning arrestor damage or failure	Transmission	HFTD Tier 3		# ignitions		
	2.d.x	Lightning arrestor damage or failure	Transmission	System		# ignitions		
	2.e.i	Switch damage or failure	Distribution	Non-HFTD	Yes	# ignitions		
	2.e.ii	Switch damage or failure	Distribution	HFTD Zone 1	Yes	# ignitions		
	2.e.iii	Switch damage or failure	Distribution	HFTD Tier 2	Yes	# ignitions		
	2.e.iv	Switch damage or failure	Distribution	HFTD Tier 3	Yes	# ignitions		
	2.e.v	Switch damage or failure	Distribution	System	Yes	# ignitions		
	2.e.vi	Switch damage or failure	Transmission	Non-HFTD		# ignitions		
	2.e.vii	Switch damage or failure	Transmission	HFTD Zone 1		# ignitions		
	2.e.viii	Switch damage or failure	Transmission	HFTD Tier 2		# ignitions		
	2.e.ix	Switch damage or failure	Transmission	HFTD Tier 3		# ignitions		
	2.e.x	Switch damage or failure	Transmission	System		# ignitions		
	2.f.i	Pole damage or failure	Distribution	Non-HFTD	Yes	# ignitions		
	2.f.ii	Pole damage or failure	Distribution	HFTD Zone 1	Yes	# ignitions		
	2.f.iii	Pole damage or failure	Distribution	HFTD Tier 2	Yes	# ignitions		
	2.f.iv	Pole damage or failure	Distribution	HFTD Tier 3	Yes	# ignitions		
	2.f.v	Pole damage or failure	Distribution	System	Yes	# ignitions		
	2.f.vi	Pole damage or failure	Transmission	Non-HFTD		# ignitions		
	2.f.vii	Pole damage or failure	Transmission	HFTD Zone 1		# ignitions		
	2.f.viii	Pole damage or failure	Transmission	HFTD Tier 2		# ignitions		
	2.f.ix	Pole damage or failure	Transmission	HFTD Tier 3		# ignitions		
	2.f.x	Pole damage or failure	Transmission	System		# ignitions		
	2.g.i	Insulator and brushing damage or failure	Distribution	Non-HFTD	Yes	# ignitions		
	2.g.ii	Insulator and brushing damage or failure	Distribution	HFTD Zone 1	Yes	# ignitions		
	2.g.iii	Insulator and brushing damage or failure	Distribution	HFTD Tier 2	Yes	# ignitions		
	2.g.iv	Insulator and brushing damage or failure	Distribution	HFTD Tier 3	Yes	# ignitions		
	2.g.v	Insulator and brushing damage or failure	Distribution	System	Yes	# ignitions		
	2.g.vi	Insulator and brushing damage or failure	Transmission	Non-HFTD		# ignitions		
	2.g.vii	Insulator and brushing damage or failure	Transmission	HFTD Zone 1		# ignitions		
	2.g.viii	Insulator and brushing damage or failure	Transmission	HFTD Tier 2		# ignitions		
	2.g.ix	Insulator and brushing damage or failure	Transmission	HFTD Tier 3		# ignitions		
	2.g.x	Insulator and brushing damage or failure	Transmission	System		# ignitions		
	2.h.i	Crossarm damage or failure	Distribution	Non-HFTD	Yes	# ignitions		
	2.h.ii	Crossarm damage or failure	Distribution	HFTD Zone 1	Yes	# ignitions		
	2.h.iii	Crossarm damage or failure	Distribution	HFTD Tier 2	Yes	# ignitions		
	2.h.iv	Crossarm damage or failure	Distribution	HFTD Tier 3	Yes	# ignitions		
	2.h.v	Crossarm damage or failure	Distribution	System	Yes	# ignitions		
	2.h.vi	Crossarm damage or failure	Transmission	Non-HFTD		# ignitions		
	2.h.vii	Crossarm damage or failure	Transmission	HFTD Zone 1		# ignitions		
	2.h.viii	Crossarm damage or failure	Transmission	HFTD Tier 2		# ignitions		
	2.h.ix	Crossarm damage or failure	Transmission	HFTD Tier 3		# ignitions		
	2.h.x	Crossarm damage or failure	Transmission	System		# ignitions		
	2.i.i	Voltage regulator / booster damage or failure	Distribution	Non-HFTD	Yes	# ignitions		

	2.i.ii	Voltage regulator / booster damage or failure	Distribution	HFTD Zone 1	Yes			# ignitions	
	2.i.iii	Voltage regulator / booster damage or failure	Distribution	HFTD Tier 2	Yes		1	# ignitions	
	2.i.iv	Voltage regulator / booster damage or failure	Distribution	HFTD Tier 3	Yes			# ignitions	
	2.i.v	Voltage regulator / booster damage or failure	Distribution	System	Yes			# ignitions	
	2.i.vi	Voltage regulator / booster damage or failure	Transmission	Non-HFTD				# ignitions	
	2.i.vii	Voltage regulator / booster damage or failure	Transmission	HFTD Zone 1				# ignitions	
	2.i.viii	Voltage regulator / booster damage or failure	Transmission	HFTD Tier 2				# ignitions	
	2.i.ix	Voltage regulator / booster damage or failure	Transmission	HFTD Tier 3				# ignitions	
	2.i.x	Voltage regulator / booster damage or failure	Transmission	System				# ignitions	
	2.j.i	Recloser damage or failure	Distribution	Non-HFTD	Yes			# ignitions	
	2.j.ii	Recloser damage or failure	Distribution	HFTD Zone 1	Yes			# ignitions	
	2.j.iii	Recloser damage or failure	Distribution	HFTD Tier 2	Yes			# ignitions	
	2.j.iv	Recloser damage or failure	Distribution	HFTD Tier 3	Yes			# ignitions	
	2.j.v	Recloser damage or failure	Distribution	System	Yes			# ignitions	
	2.j.vi	Recloser damage or failure	Transmission	Non-HFTD				# ignitions	
	2.j.vii	Recloser damage or failure	Transmission	HFTD Zone 1				# ignitions	
	2.j.viii	Recloser damage or failure	Transmission	HFTD Tier 2				# ignitions	
	2.j.ix	Recloser damage or failure	Transmission	HFTD Tier 3				# ignitions	
	2.j.x	Recloser damage or failure	Transmission	System				# ignitions	
	2.k.i	Anchor / guy damage or failure	Distribution	Non-HFTD	Yes			# ignitions	
	2.k.ii	Anchor / guy damage or failure	Distribution	HFTD Zone 1	Yes			# ignitions	
	2.k.iii	Anchor / guy damage or failure	Distribution	HFTD Tier 2	Yes			# ignitions	
	2.k.iv	Anchor / guy damage or failure	Distribution	HFTD Tier 3	Yes			# ignitions	
	2.k.v	Anchor / guy damage or failure	Distribution	System	Yes			# ignitions	
	2.k.vi	Anchor / guy damage or failure	Transmission	Non-HFTD				# ignitions	
	2.k.vii	Anchor / guy damage or failure	Transmission	HFTD Zone 1				# ignitions	
	2.k.viii	Anchor / guy damage or failure	Transmission	HFTD Tier 2				# ignitions	
	2.k.ix	Anchor / guy damage or failure	Transmission	HFTD Tier 3				# ignitions	
	2.k.x	Anchor / guy damage or failure	Transmission	System				# ignitions	
	2.l.i	Sectionalizer damage or failure	Distribution	Non-HFTD	Yes			# ignitions	
	2.l.ii	Sectionalizer damage or failure	Distribution	HFTD Zone 1	Yes			# ignitions	
	2.l.iii	Sectionalizer damage or failure	Distribution	HFTD Tier 2	Yes			# ignitions	
	2.l.iv	Sectionalizer damage or failure	Distribution	HFTD Tier 3	Yes			# ignitions	
	2.l.v	Sectionalizer damage or failure	Distribution	System	Yes			# ignitions	
	2.l.vi	Sectionalizer damage or failure	Transmission	Non-HFTD				# ignitions	
	2.l.vii	Sectionalizer damage or failure	Transmission	HFTD Zone 1				# ignitions	
	2.l.viii	Sectionalizer damage or failure	Transmission	HFTD Tier 2				# ignitions	
	2.l.ix	Sectionalizer damage or failure	Transmission	HFTD Tier 3				# ignitions	
	2.l.x	Sectionalizer damage or failure	Transmission	System				# ignitions	
	2.m.i	Connection device damage or failure	Distribution	Non-HFTD	Yes			# ignitions	
	2.m.ii	Connection device damage or failure	Distribution	HFTD Zone 1	Yes			# ignitions	
	2.m.iii	Connection device damage or failure	Distribution	HFTD Tier 2	Yes		1	# ignitions	
	2.m.iv	Connection device damage or failure	Distribution	HFTD Tier 3	Yes			# ignitions	
	2.m.v	Connection device damage or failure	Distribution	System	Yes			# ignitions	
	2.m.vi	Connection device damage or failure	Transmission	Non-HFTD				# ignitions	
	2.m.vii	Connection device damage or failure	Transmission	HFTD Zone 1				# ignitions	
	2.m.viii	Connection device damage or failure	Transmission	HFTD Tier 2				# ignitions	
	2.m.ix	Connection device damage or failure	Transmission	HFTD Tier 3				# ignitions	
	2.m.x	Connection device damage or failure	Transmission	System				# ignitions	
	2.n.i	Transformer damage or failure	Distribution	Non-HFTD	Yes			# ignitions	
	2.n.ii	Transformer damage or failure	Distribution	HFTD Zone 1	Yes			# ignitions	
	2.n.iii	Transformer damage or failure	Distribution	HFTD Tier 2	Yes			# ignitions	
	2.n.iv	Transformer damage or failure	Distribution	HFTD Tier 3	Yes			# ignitions	
	2.n.v	Transformer damage or failure	Distribution	System	Yes			# ignitions	
	2.n.vi	Transformer damage or failure	Transmission	Non-HFTD				# ignitions	
	2.n.vii	Transformer damage or failure	Transmission	HFTD Zone 1				# ignitions	
	2.n.viii	Transformer damage or failure	Transmission	HFTD Tier 2				# ignitions	
	2.n.ix	Transformer damage or failure	Transmission	HFTD Tier 3				# ignitions	
	2.n.x	Transformer damage or failure	Transmission	System				# ignitions	
	2.o.i	Other	Distribution	Non-HFTD	Yes			# ignitions	
	2.o.ii	Other	Distribution	HFTD Zone 1	Yes			# ignitions	
	2.o.iii	Other	Distribution	HFTD Tier 2	Yes			# ignitions	
	2.o.iv	Other	Distribution	HFTD Tier 3	Yes			# ignitions	
	2.o.v	Other	Distribution	System	Yes			# ignitions	
	2.o.vi	Other	Transmission	Non-HFTD				# ignitions	
	2.o.vii	Other	Transmission	HFTD Zone 1				# ignitions	
	2.o.viii	Other	Transmission	HFTD Tier 2				# ignitions	
	2.o.ix	Other	Transmission	HFTD Tier 3				# ignitions	
	2.o.x	Other	Transmission	System				# ignitions	

3. Wire-to-wire contact	3.a.i	Wire-to-wire contact / contamination	Distribution	Non-HFTD	Yes			# ignitions	
	3.a.ii	Wire-to-wire contact / contamination	Distribution	HFTD Zone 1	Yes			# ignitions	
	3.a.iii	Wire-to-wire contact / contamination	Distribution	HFTD Tier 2	Yes	1		# ignitions	
	3.a.iv	Wire-to-wire contact / contamination	Distribution	HFTD Tier 3	Yes			# ignitions	
	3.a.v	Wire-to-wire contact / contamination	Distribution	System	Yes			# ignitions	
	3.a.vi	Wire-to-wire contact / contamination	Transmission	Non-HFTD				# ignitions	
	3.a.vii	Wire-to-wire contact / contamination	Transmission	HFTD Zone 1				# ignitions	
	3.a.viii	Wire-to-wire contact / contamination	Transmission	HFTD Tier 2				# ignitions	
	3.a.ix	Wire-to-wire contact / contamination	Transmission	HFTD Tier 3				# ignitions	
	3.a.x	Wire-to-wire contact / contamination	Transmission	System				# ignitions	
4. Contamination	4.a.i	Contamination	Distribution	Non-HFTD	Yes			# ignitions	
	4.a.ii	Contamination	Distribution	HFTD Zone 1	Yes			# ignitions	
	4.a.iii	Contamination	Distribution	HFTD Tier 2	Yes			# ignitions	
	4.a.iv	Contamination	Distribution	HFTD Tier 3	Yes			# ignitions	
	4.a.v	Contamination	Distribution	System	Yes			# ignitions	
	4.a.vi	Contamination	Transmission	Non-HFTD				# ignitions	
	4.a.vii	Contamination	Transmission	HFTD Zone 1				# ignitions	
	4.a.viii	Contamination	Transmission	HFTD Tier 2				# ignitions	
	4.a.ix	Contamination	Transmission	HFTD Tier 3				# ignitions	
	4.a.x	Contamination	Transmission	System				# ignitions	
5. Utility work / Operation	5.a.i	Utility work / Operation	Distribution	Non-HFTD	Yes			# ignitions	
	5.a.ii	Utility work / Operation	Distribution	HFTD Zone 1	Yes			# ignitions	
	5.a.iii	Utility work / Operation	Distribution	HFTD Tier 2	Yes			# ignitions	
	5.a.iv	Utility work / Operation	Distribution	HFTD Tier 3	Yes			# ignitions	
	5.a.v	Utility work / Operation	Distribution	System	Yes			# ignitions	
	5.a.vi	Utility work / Operation	Transmission	Non-HFTD				# ignitions	
	5.a.vii	Utility work / Operation	Transmission	HFTD Zone 1				# ignitions	
	5.a.viii	Utility work / Operation	Transmission	HFTD Tier 2				# ignitions	
	5.a.ix	Utility work / Operation	Transmission	HFTD Tier 3				# ignitions	
	5.a.x	Utility work / Operation	Transmission	System				# ignitions	
6. Vandalism / Theft	6.a.i	Vandalism / Theft	Distribution	Non-HFTD	Yes			# ignitions	
	6.a.ii	Vandalism / Theft	Distribution	HFTD Zone 1	Yes			# ignitions	
	6.a.iii	Vandalism / Theft	Distribution	HFTD Tier 2	Yes			# ignitions	
	6.a.iv	Vandalism / Theft	Distribution	HFTD Tier 3	Yes			# ignitions	
	6.a.v	Vandalism / Theft	Distribution	System	Yes			# ignitions	
	6.a.vi	Vandalism / Theft	Transmission	Non-HFTD				# ignitions	
	6.a.vii	Vandalism / Theft	Transmission	HFTD Zone 1				# ignitions	
	6.a.viii	Vandalism / Theft	Transmission	HFTD Tier 2				# ignitions	
	6.a.ix	Vandalism / Theft	Transmission	HFTD Tier 3				# ignitions	
	6.a.x	Vandalism / Theft	Transmission	System				# ignitions	
7. Other	7.a.i	All Other	Distribution	Non-HFTD	Yes			# ignitions	
	7.a.ii	All Other	Distribution	HFTD Zone 1	Yes			# ignitions	
	7.a.iii	All Other	Distribution	HFTD Tier 2	Yes			# ignitions	
	7.a.iv	All Other	Distribution	HFTD Tier 3	Yes			# ignitions	
	7.a.v	All Other	Distribution	System	Yes			# ignitions	
	7.a.vi	All Other	Transmission	Non-HFTD				# ignitions	
	7.a.vii	All Other	Transmission	HFTD Zone 1				# ignitions	
	7.a.viii	All Other	Transmission	HFTD Tier 2				# ignitions	
	7.a.ix	All Other	Transmission	HFTD Tier 3				# ignitions	
	7.a.x	All Other	Transmission	System				# ignitions	
8. Unknown	8.a.i	Unknown	Distribution	Non-HFTD	Yes			# ignitions	
	8.a.ii	Unknown	Distribution	HFTD Zone 1	Yes			# ignitions	
	8.a.iii	Unknown	Distribution	HFTD Tier 2	Yes			# ignitions	
	8.a.iv	Unknown	Distribution	HFTD Tier 3	Yes			# ignitions	
	8.a.v	Unknown	Distribution	System	Yes			# ignitions	
	8.a.vi	Unknown	Transmission	Non-HFTD				# ignitions	
	8.a.vii	Unknown	Transmission	HFTD Zone 1				# ignitions	
	8.a.viii	Unknown	Transmission	HFTD Tier 2				# ignitions	
	8.a.ix	Unknown	Transmission	HFTD Tier 3				# ignitions	
	8.a.x	Unknown	Transmission	System				# ignitions	

Liberty Utilities CA-Lake Tahoe Inspection Report

Liberty Utilities, CA WMP CovCo KB 4203 Resiliancy

Inspection #	**1365**	**Design #**	**5018**
Project #	**17895**	**Work Order #**	**--**
Inspection Date	**2/7/2022**	**Constructed By:**	
Inspected By	**Mark Baker**		

A quality control inspection was performed by Hendrix ACS for the Project referenced. Please review the report for any possible corrective action.

	Inspected	Comments	Recommendations	Corrective Action
ARRESTORS	Installed at Open Points	Pass		
CABLE	Cable Strip Opening	Pass		
	Full Tension Sleeves Used for Splicing	Pass		
	Proper Dead End Preforms / Shoes Properly Installed	Pass		
	Proper Sag	Pass		
	Sleaves are Re-Insulated	Pass		
	Splices	Pass		
DESIGN	Design Deviation Other	Pass		
	Pole Top Assemblies Per Design	Pass		

	Inspected	Comments	Recommendations	Corrective Action
	Walkdown Recommendations Implemented	Pass		
INSPECTION OBSERVATIONS	General Inspection Observations	Pass		
INSULATOR	Correct Conductor Clamp Position (Vice Top)	Pass		
	Correct Pin Lengthh	Pass		
	Covered Tie Wire (Tie Tops)	Pass		
	Dead End Clamps at Dead End	Pass		
	Preform Grips Not Allowed	Pass		
	Torque Bolt Eyes Broken Off (Vice Tops)	Pass		
MESSENGER	Guy Attached at Messenger Height	Pass		
	Line-Duc Properly Installed on Messenger (when spacer cable cover removed for tap attachment)	Pass		
	Messenger Bonded to System Neutral at Dead End	Pass		
	Messenger Grounded Every Pole	Pass		
	Proper Bracket Installation on Corner (PSAC or CMA)	Pass		
	Proper Messenger Pole Attachment (HDTC)	Pass		
	Proper Messenger Pole Attachment at Corner	Pass		

	Inspected	Comments	Recommendations	Corrective Action
	Proper Tension (slack noticeable)	Pass		
POLES	Backfill Pole	Pass		
	Pole Class (New Poles)	Pass		
PROJECT OBSERVATIONS COMMENTS	Project Comment(s)	Pass		
RELIABILITY	Other	Pass		
	Shield Wire Properly Grounded	Pass		
SPACERS	Spacers - Attached to Anti Sway Bar on Taps	Pass		
	Spacers - Bracket Clamps Properly Attached To Messenger & Phase Cables	Pass		
	Spacers - Correct Spacer	Pass		
	Spacers - Spaced Evenly Every 25-33 feet	Pass		
STATIC WIRE	Guy Attached at Static Wire Height	Pass		
	Line-Duc Properly Installed on Static Wire (when spacer cable cover removed for tap attachment)	Pass		
	Static Wire Bonded to System Neutral at Dead End	Pass		
	Static Wire Grounded at Every Pole	Pass		
TAPS	Connectors Covered	Pass		

	Inspected	Comments	Recommendations	Corrective Action
	Line Duc	Pass		
	Tap Offset by 24" from adjacent taps or ground points	Pass		
TREE & TRIMMING	Clearance to Trees	Pass		
	Trimming Needed	Pass		
	Undergrowth	Pass		
WILDLIFE & WILDFIRE PROTECTION	Arrester Lead Wire, Covered Wire	Pass		
	Arrester Terminal Cap	Pass		
	Avian Nesting - Line or Vicinity	Pass		
	Capacitor Bushing Cover	Pass		
	Cross Arm Jumper Leads, Covered Wire	Pass		
	Crossarm Bare Wire Phase Cover	Pass		
	Cutout Connector Cover	Pass		
	Cutout Leads, Covered Wire	Pass		
	Dead End Strain Clamp Cover on Crossarm	Pass		
	Dead End Strain Clamp Cover on Switch	Pass		
	Guy Strain Insulator in Primary Zone	Pass		
	Lineduc Installed on Messenger at Switch	Pass		

Inspected	Comments	Recommendations	Corrective Action
Lineduc Installed on Messenger at Tap	Pass		
Perch Preventor on Crossarm	Pass		
Recloser Bushing Cover	Pass		
Riser Termination Cover	Pass		
Riser Termination Lead Wire, Covered Wire	Pass		
Tap Connector Cover	Pass		
Transformer Bushing Guard	Pass		
Transformer Lead Wire, Covered Wire	Pass		

Inspection Summary

Work Group	Details	Items	Deficiencies
ARRESTORS	1	1	0
CABLE	6	6	0
DESIGN	3	3	0
INSPECTION OBSERVATIONS	1	1	0
INSULATOR	6	6	0
MESSENGER	8	8	0
POLES	2	2	0
PROJECT OBSERVATIONS COMMENTS	1	1	0
RELIABILITY	2	2	0
SPACERS	4	4	0

Inspection Summary

Work Group		Details	Items	Deficiencies
STATIC WIRE		4	4	0
TAPS		3	3	0
TREE & TRIMMING		3	3	0
WILDLIFE & WILDFIRE PROTECTION		20	20	0
	Total	**64**	**64**	**0**

Please contact your Hendrix ACS Account Representative with any questions. You can also reach us at ACSSupport@Hendrix-wc.com

Thank you,

Hendrix ACS Field Inspection

Program Target	2019		2020		2021		2022		Units	Audited by Third-Party? (Y/N)	Notes (including definitions and sources for Top-Risk%)
	Target	Perf.	Target	Perf.	Target	Perf.	Target	Target%/Top-Risk?			
Weather stations	-	10	10	19	10	0	10	-	# of weather stations installed	N	
Continuous monitoring sensors	-	-	-	-	10	0	10	-	# of continuous monitoring sensors installed	N	
Fault indicators for detecting faults on electric lines and equipment	-	-	-	-	-	-	2	-	# of circuits with fault indicators installed	N	
Covered conductor	-	2.7	5	6.82	9.1	3.75	9.55	22/22	# of circuit miles	N	The top 22% of risk areas used for this target relate to the Reax fire risk map described in Section 4.2.1 of Liberty's 2022 WMP Update.
Distribution pole replacement	-	-	-	62	400	211	231	14/22	# of poles replaced	N	The top 22% of risk areas used for this target relate to the Reax fire risk map described in Section 4.2.1 of Liberty's 2022 WMP Update.
Expulsion fuse replacement	-	250	-	853	1,500	867	1,500	41/22	# of fuses replaced	N	The top 22% of risk areas used for this target relate to the Very High category in the Reax fire risk map described in Section 4.2.1 of Liberty's 2022 WMP Update.
System automation equipment	-	6	-	4	3	2	4	100/48	# of automatic reclosers installed	N	The top 48% of risk areas used for this target relate to the High and Very High categories in the Reax fire risk map described in Section 4.2.1 of Liberty's 2022 WMP Update.
Circuit breaker replacements	1	1	1	1	1	1	1	100/22	# of substations with circuit breaker replacements	N	
Tree attachments	-	-	-	-	60	37	45	1/22	# of tree attachments removed	N	The top 22% of risk areas used for this target relate to the Very High category in the Reax fire risk map described in Section 4.2.1 of Liberty's 2022 WMP Update.
Substation animal guards	-	-	-	-	-	2	4		# of animal guards installed	N	
CAL FIRE exempt hardware	-	-	-	-	-	0	TBD		# of CAL FIRE exempt hardware installed	N	
Open wire/grey wire	-	-	-	-	-	0	TBD		# of circuit miles	N	
Undergrounding of electric lines	-	-	-	-	-	1.03	0.36	0/22	# of circuit miles	N	The top 22% of risk areas used for this target relate to the Very High category in the Reax fire risk map described in Section 4.2.1 of Liberty's 2022 WMP Update.
Detailed inspections of distribution electric lines and equipment	-	-	100% of system	100% of system	52	59.8	308	15/22	# of circuit miles inspected	N	The top 22% of risk areas used for this target relate to the Very High category in the Reax fire risk map described in Section 4.2.1 of Liberty's 2022 WMP Update.
Intrusive pole inspections	-	-	-	2,577	3,600	3,506	2,598	22/22	# of poles inspected	N	The top 22% of risk areas used for this target relate to the Very High category in the Reax fire risk map described in Section 4.2.1 of Liberty's 2022 WMP Update.
Patrol inspections of distribution electric lines and equipment	20% of system	20% of system	100% of system	100% of system	2,500	2,500	706	24/22	# of circuit miles inspected	N	The top 22% of risk areas used for this target relate to the Very High category in the Reax fire risk map described in Section 4.2.1 of Liberty's 2022 WMP Update.
Quality assurance / quality control of inspections	-	-	-	-	-	-	0.5% of detailed inspections		# of circuit miles inspected	Y	
Substation inspections	-	-	46	46	46	46	42	28/22	# of substations inspected	N	The top 22% of risk areas used for this target relate to the Very High category in the Reax fire risk map described in Section 4.2.1 of Liberty's 2022 WMP Update.
Additional efforts to manage community and environmental impacts	-	-	-	14	13	3.4	9		# of circuit miles	N	
Detailed inspections of vegetation around distribution electric lines and equipment	-				207	178	221		# of circuit miles inspected	N	
Fuel management and reduction of "slash" from vegetation management activities	-	-	-	376	2,100	2,119	280		Tons of biomass / # of acres *	N	
LiDAR inspections of vegetation around distribution electric lines and equipment	-	-	-	320	730	701	701		# of circuit miles inspected	N	
Patrol inspections of vegetation around distribution electric lines and equipment	-	-			150	179	167		# of circuit miles inspected	N	
Quality assurance / quality control of vegetation inspections	-				150	155	220		# of circuit miles	Y	
Remediation of at-risk species	-				230	238	238		# of circuit miles	N	
Removal and remediation of trees with strike potential to electric lines and equipment	-				150	128	127		# of circuit miles	N	
Vegetation management to achieve clearances around electric lines and equipment	-				328	361	701		# of circuit miles	N	

* Liberty changed the unit of measurement for this initiative from tons of biomass in 2021 to number of acres in 2022.