5 PROACTIVE DE-ENERGIZATION (PUBLIC SAFETY OUTAGE MANAGEMENT)

PSOM refers to a planned circuit outage triggered by conditions that pose a significant safety threat to the Companies' customers, infrastructure or the public. PSOM is a measure of last resort to prevent or mitigate the potential catastrophic impacts caused by wildfire. PSOM events may be initiated when the Companies' obligation to operate the system safely is jeopardized by natural conditions. PSOM procedures are enacted typically during official declared fire season, which may be extended based on prevailing weather conditions in a particular year. A series of quantitative and qualitative criteria must be met before de-energization occurs, which will then be followed by continued weather condition tracking and communication with vested stakeholders. The Companies have designated specific zones, only within the Tier 3 fire threat area, that will be subject to fire-related PSOM events. There may, however, be related impacts outside these zones if the de-energized circuits impact customers outside the established proactive de-energization zones ("PDZ"). The details are described below.

5.1 PSOM Criteria

As mentioned in Section 3, the Companies mapped several attributes that collectively present a potential for fire threat conditions. A variety of factors go in to determining whether to employ a PSOM in a given area of the Companies' service territory. These factors may include, and are not limited to:

- Weather conditions;
- Vegetation/fuel conditions;
- Field observations;
- Information from first responders;
- Flying debris;
- Meteorology;
- Expected duration of conditions;
- Information from a Fire Behavior Analyst ("FBAN"); and
- Location of any existing fires.

Based on these factors and the Companies' operational experience, the decision on how to manage risk to communities affected will be made by NV Energy. Three key quantitative inputs, largely informed by factors listed above, are used as the primary metrics for determining if, when, and where a PSOM event may be necessary to reduce risk to the public. The baseline proactive de-energization thresholds established during the 2019 fire season demonstrated a zero risk level and provided a starting point for developing area specific reasonable risk de-energization thresholds that are discussed in these comments. Historical weather station observations were analyzed to quantify how frequently various de-energization thresholds have been exceeded in the past. However, actual observations during the 2019 fire season resulted in significantly higher number (i.e., at least once weekly) of potential PSOM events. Therefore, it was concluded that the initial thresholds (i.e., Energy Release Component ("ERC") > 60th percentile, wind gusts > 30 mph, and Fosberg Fire Weather Index ("FFWI") > 50) established unreasonably low risk levels and would result in unnecessary service interruptions. Given that proactive de-energization or PSOM is a last resort measure for fire prevention, PSOM thresholds must be sufficiently high to prevent unnecessary and/or frequent service interruptions. Additionally, it was determined that slightly different wind gust and FFWI is required for northern and southern Nevada Tier 3 regions.[45] Finally, a qualitative assessment was determined to be necessary along with the criteria-based quantitative assessment prior to triggering a PSOM event.

[45] NV Energy's PSOM Comments under Docket No. 19-06009 filed on June 26, 2019, page 3.

Through an iterative process, the quantitative thresholds shown in Table 29 have been established and were tested against historical weather station observations and archived weather forecast data to assess historical threshold exceedance frequencies.

Table 29: Updated Quantitative Thresholds

Region	ERC	Wind Gust (mph)*	FFWI*
Lake Tahoe / Truckee Transmission	>92nd percentile	>40 mph	>50
Kyle Canyon / Angel Peak	>92nd percentile	>45 mph	>60

*six-hour average

The three quantitative metric definitions are:

1. FFWI: Quantifies the effect of short-term variations in meteorological conditions including temperature, humidity, and wind speed to determine the potential for wind-driven fire spread. This metric relies on factors that influence instantaneous fire weather conditions but does not consider other factors that may affect fire spread, including topography, fuel type, fuel moisture, and historic precipitation.

2. NFDRS ERC: Value proportional to energy per unit area that may be released within a fire's flaming front. ERC may vary daily due to changes in the moisture content of fuels. In turn, these factors are dependent on recent precipitation, relative humidity, and temperature. This metric typically peaks during summer months in the western U.S., reducing after the return of rainfall and reduced temperatures. As ERC depends on fuel loading, it is commonly referred to in terms of percentiles instead of an absolute value. The National Wildfire Coordinating Group issued a directive for all jurisdictional fire entities or agencies to transition to the new 2016 NFRDS by January 2021.[46] This update may affect the Companies' PSOM procedures through the ERC calculation. Per discussions with REAX Engineering, the recommendation for the 2020 fire season directs the Companies to continue using the ERC calculation on Fuel Model G for operational purposes. Moreover, the Companies will continue to perform fuel sampling to estimate the ERC in the PDZs and report that data to relevant agencies on an as needed basis. The Companies also plan to collaborate with these agencies to ensure that consistent sampling and measurement methods are used.

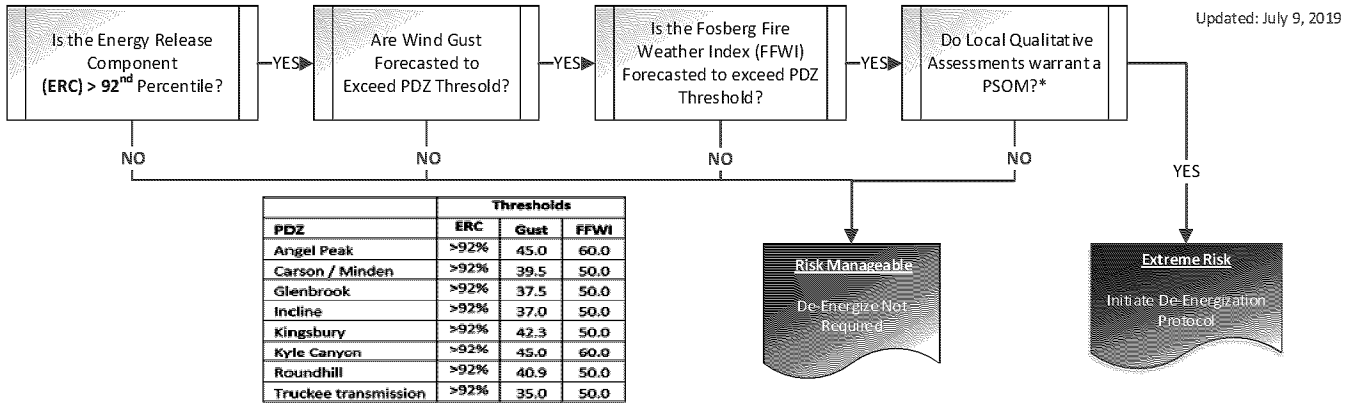
3. Wind gust speed: Wind gusts that reach an approximate 35 to 45 mph threshold lead to a statistically significant increase in outage occurrence, which may be viewed here as a proxy for ignition occurrence. While wind speed is factored into the FFWI metric above, live observations of elevated winds must be considered as a stand-alone metric due to the risk high winds pose to above-ground assets.

Conditions that satisfy the thresholds set by these three metrics (FFWI, ERC, and wind gust speeds) may be cause for a PSOM event. Qualitative factors, as listed below, will also be used when making the final determination. Figure 46 summarizes the thresholds and the decision stream. The Companies will perform robust analysis and discussion around each potential event before making a final decision on whether to implement a PSOM event.

[46] NWCG. "National Fire Danger Rating System 2016 Release Memo." https://www.nwcg.gov/sites/default/files/memos/eb-m-19-002.pdf. July 24, 2019.

Figure 46: PSOM De-Energization Threshold Criteria

Public Safety Outage Management
De-Energization Threshold Criteria



	Thresholds		
PDZ	ERC	Gust	FFWI
Angel Peak	>92%	45.0	60.0
Carson / Minden	>92%	39.5	50.0
Glenbrook	>92%	37.5	50.0
Incline	>92%	37.0	50.0
Kingsbury	>92%	42.3	50.0
Kyle Canyon	>92%	45.0	60.0
Roundhill	>92%	40.9	50.0
Truckee transmission	>92%	35.0	50.0

PSOM – Public Safety Outage Management: Circuit De-Energization as a last resort option to mitigate extreme wild fire risk areas (PDZ – Planed De-energization Zones) and conditions. Safety is our top priority and PSOM reflect the best utility safety practices.

ERC (Energy Release Component) - Are seasonal conditions associated with intermediate to long term drying (e.g., live fuel moisture content) such that rapidly spreading fires are possible? The National Fire Danger Rating System's ERC is proportional to energy per unit area that can be released within a fire's flaming front. 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.

Wind Gusts - Are forecasted 6 hour rolling average wind gust speeds high enough to increase the probability of powerline-associated fire ignition?

FFWI (Fosberg Fire Weather Index) – Are 6 hour rolling average forecasted fire weather conditions (including temperature & relative humidity) conducive to rapidly spreading fires? The FFWI 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, and recent precipitation. Generally, Fosberg indices above 50 are considered conducive to rapid wind-driven fire spread.

*Perform community, environmental and infrastructure assessment in de-energization zones considering (Day 7-8):

A. Area Specific Impacts (Major Accounts)
B. Specific vegetation management input (Delivery Support)
C. Specific input from patrols (Lines)
D. Specific view on construction type (Design Resilience)
E. Specific fire professional and first responders view of conditions (Emergency Management)
F. Specific meteorological view of conditions (Grid Operations)
H. Critical Infrastructure Readiness (Telecom, Water / Sewage, Comfort Center, etc)

In addition to the weather station observations, three years (2016 through 2018) of archived weather forecast data were analyzed using the highest resolution forecast model to determine how frequently the revised thresholds were forecast to be exceeded. Based on historical weather station observations for several years of reviewed data, one potential exceedance in the Lake Tahoe basin, three exceedances in the Truckee (northern California) territory and no exceedances in the Mt. Charleston territory were identified. Based on archived weather forecast data for last three years, the de-energization thresholds were exceeded for one hour per year for Angel Peak (Mt. Charleston) and 0.7 hours per year for Carson/Minden (Lake Tahoe basin).[47] Based on initial de-energization thresholds, at least one de-energization event per fire season was expected in each of the above areas. Based on updated thresholds, some areas may not experience any PSOM event in a non-drought year like 2019. It is worthwhile to note that actual frequency and duration of these events may vary due to variability in weather conditions from one year to another especially during drought years. In summary, NV Energy is currently managing the PSOM process based on the above thresholds in Figure 46 as they balance a reasonable risk profile of last resort mitigation measure with customer service interruptions.

Upon further evaluation and as noted in Figure 46 above, NV Energy also established a qualitative criteria that will be utilized if the quantitative criteria is met. An objective process is developed for this qualitative assessment and consists of several factors that enable the Companies to perform a community, environmental and infrastructure assessment. Once the quantitative criteria is triggered in one of the eight proactive de-energization zones, NV Energy Grid Operations will seek input from several team members on the following parameters and individual and total scores (zero to 10 with 10 being no concerns or highest confidence and zero being extremely high concerns or lowest confidence-if specific items cannot be scored for an event, they may be assigned a "go/no go" decision) will be assigned as part of this assessment:

- Vegetation Management: Based on the last vegetation management cycle completed, the NV Energy Delivery Support team will complete this assessment.

- Patrol/Detailed Inspection: Based on the last patrol or inspection completed, the NV Energy Delivery Operations or Lines team managing the affected area will complete this assessment.

- Local Fire District Input: NV Energy Fire Mitigation Specialist- Fire Chief and/or Emergency Management will seek input from the local fire district on their assessment of field conditions and necessity for a PSOM event. Also, may seek input from a FBAN on developing possible fire behavior information, predicting fire growth, and interpreting possible fire characteristics if a fire started during the weather event.

- Large Event/Visitor Status: NV Energy Major Accounts will provide input based on if a significant event is projected during the potential PSOM event duration.

- Water/Sewage Readiness: NV Energy Major Accounts, Customer Operations and/or Emergency Management will provide input on whether any critical water or sewage treatment facilities will have any issues. Three business units are listed, but the respective business unit who owns the customer relationship will provide input.

- Telecommunications Readiness: NV Energy Major Accounts will provide input on whether any critical telecommunications facilities will have any issues. Three business units are listed, but the respective business unit who owns the customer relationship will provide input.

- Infrastructure Design: NV Energy Distribution Design and Transmission Engineering will provide input based on the base design of overhead infrastructure and its expected resiliency. The

[47] Lake Tahoe basin is divided into five proactive de-energization zones: Incline, Glenbrook, Carson/Minden, Roundhill and Kingsbury. Therefore, there are a total of eight proactive de-energization zones also including Truckee, Angel Peak and Kyle Canyon.

Companies' revised designs would have higher scores while older designs and aged systems would get lower scores.

- Customer Resource Centers: NV Energy Community Relations will provide input based on the readiness levels for the customer resource centers.

- Restoration Readiness: NV Energy Grid Operations will provide input based on the restoration readiness for the affected circuits.

- Local Emergency Management Input: NV Energy Emergency Management and/or Fire Mitigation Specialist- Fire Chief will seek input from the local emergency management contacts on their assessment of field conditions and necessity for a PSOM event.

NV Energy Grid Operations will recommend a PSOM event to NV Energy's Senior Vice President of Operations and Vice President of Transmission if the total score of the above qualitative assessment is lower than 50 out of 100 (maximum) or three or more individual category scores are lower than three or one or more of the category scores is extreme or unacceptable. Specific categories with a "go or no-go" decision may also impact the final decision and it is possible that a single category score or evaluation may impact the final decision. The final decision would be made by either NV Energy's Senior Vice President of Operations or Vice President of Transmission based on the above quantitative and qualitative assessments.

NV Energy believes that the combination of above quantitative and qualitative assessments will enable a prudent decision making process that will only bring forward the absolutely necessary PSOM events.