

ENERGY SAFETY
Data Response

BVES Data Request No.	SPD_BVES_2025_002
Request Date:	May 30, 2025
Due Date:	June 4, 2025
Requester:	Tyler Dunaway, Utilities Engineer, Safety Policy Division

SUBJECT(S):

Total Attachments:

BVES RESPONSE

1. Given BVES' geographic location with limited ingress and egress options for residents, has egress been considered in the wildfire consequence calculation? For example, has BVES considered the use of miles of roads per capita as a factor to determine egress availability?

RESPONSE: BVES's current models do not include egress in the wildfire consequence calculation. BVES will continue to work with its modeling contractors to determine the most effective way to incorporate egress in the wildfire consequence calculation. As a tourist destination, the population of Big Bear Lake and surrounding communities has very large fluctuations. For example, during the peak season, the population can increase 10-fold. Often on weekends, the population is 2 to 4 times larger. These fluctuations will need to be considered in the wildfire consequence calculation that includes egress.

BVES participates in the Risk Modelling Working Group (RMWG) and will follow closely discussions on including egress in wildfire consequence calculations.

BVES recognizes the importance of egress for evacuation (and ingress for first responders). It should be noted that BVES has hardened all its facilities on the primary evacuation routes. Additionally, 49% of BVES's overhead facilities in the service area have been hardened for evacuation. BVES is on track to harden over 80% of its facilities for evacuation by 2028.

2. SPD reviewed the use of Jeffries uninformed prior to estimate the probability that ignition events occur as the result of an environmental or equipment failure events. Given that Southern California Edison (SCE) provides a portion of BVES' power, can BVES calculate ignition probability using the HFTD Tier 2 and Teir 3 ignition data collected by SCE?
 - a. If so, explain how BVES could use this data to calculate ignition probability?
 - b. If not, explain why not. What are the limitations to this approach?

RESPONSE: 2. As stated in Section 3.4 of the BVES 2026 – 2028 Base WMP, the CPUC data was considered for calculation of the probability of ignition, but the CPUC data are incomplete. Utilities are only required to report events that meet the criteria noted in Section 3.4 of the BVES 2026 – 2028 WMP (i.e., events that are considered reportable ignition events), but there is no publicly available information on the total number of ignition events that were not considered reportable. Therefore, BVES only has access to the number of failures and not the number of trials, both of which are required to calculate a probability of ignition.

3. Provide an Excel workpaper documenting outages logged by BVES over the 2015-2025 time frame. Include the columns / data shown in the attached excel template (SPD_BVES_2025_002- Excel Template)
 - a. Does BVES collect data on faults? Explain.

RESPONSE: a) BVES does collect data on equipment faults in its outage log, see document “SPD_BVES_2025_002” for BVES outage log.

4. Table 6-1 - List of prioritized areas in an electrical Corporations Service Territory Based on Overall Utility Risk
 - a. This chart shows close to a 1:2 ratio between the wildfire risk score (total of 6.15) and the outage program risk score (total of 10.74). For other large utilities, these numbers are much more heavily weighted towards the wildfire risk portion. For example, PG&E's most risky circuits have around a 10:1 ratio. Explain why BVES's ratio is close to 1:2 given the fact that BVES has not implemented PEDS as a component of outage risk at this time. Will this ratio increase with regards to overall risk score after the PEDS component is included by the DIREXYON model?
 - b. The circuits in this chart are not prioritized by the Overall Utility Risk score. They are also not prioritized by average Overall Utility Risk per circuit mile. Provide additional information regarding the reasoning behind prioritizing the chart in this manner with an associated calculation or chart callout to provide background / justification.

RESPONSE:

- a. For the BVES 2026 – 2028 Base WMP, a weighting factor of 50% was applied to both wildfire risk and PSPS risk based on BVES subject matter expert (SME) input. As the risk models mature, the weighting factors may change.

As BVES is not a large utility, but instead an SMJU, it is not straightforward to compare model results between larger IOUs and BVES. While BVES cannot speak to how large IOUs calculate wildfire and outage program risk scores, BVES is a winter-peaking utility operating in a unique mountainous climate where high wind events are often accompanied by precipitation and cooler weather, which helps reduce risk scores compared to a summer-peaking utility where Santa Ana events often result in warm, dry conditions during high wind events. BVES is also aware that it has a high proportion of elderly and AFN customers which serves to drive outage program risk scores up.

- b. As stated on page 73 of the 2026-2028 Base WMP and in Data Request OEIS-P-WMP_2025-BVES-001 RESPONSE, feasibility constraints affect the priority of risk mitigation initiatives. For example, some circuits with significant consequence-driven risk have already undergone significant mitigation efforts, and it is infeasible to focus significant amounts of money for marginal reductions in risk. For example, although Shay circuit has a significant amount of risk due to a significant number of buildings in the area, its conductor has already been fully covered, and it is not feasible to prioritize it at this time.
5. Provide a complete chart of all ignitions in the BVES territory. As previously mentioned in the WMP, BVES has not experienced any CPUC reportable ignition in the last 20 years (Page 13 of the WMP). Has BVES recorded any smaller non-reportable ignitions?
 - a. If so, provide a dataset of these ignitions that includes the columns in the Question



5 spreadsheet of the attached SPD_BVES_2025_002- Excel Template.xlsx workbook.

RESPONSE: 5. BVES has not recorded (and experienced) any smaller non-reportable ignitions. 5.a. No dataset is available since BVES has not recorded (and experienced) any smaller non-reportable ignitions.

6. 6.1.3.3 Initiative Activity Scheduling (Pg 81)

- a. Does BVES have a more detailed schedule showing how they plan to implement mitigation efforts over the next few years? Section 6.1.3.3 in the Energy Safety WMP Guidelines requires that the electrical corporation must report on its schedule for implementing its portfolio of activities. The electrical corporation must describe its preliminary schedules for each activity and its iterative processes for modifying activities. Does BVES have a basic Gantt chart showing overall mitigation project timelines? If so, provide a copy.
- b. BVES does not include how they will measure the effectiveness of activities (e.g., tracking the number of PEDS de-energizations that had the potential to ignite a wildfire due to observed damage/contact prior to re-energization). Based on the size of the utility we understand that the weekly meeting could be used to discuss the effectiveness of mitigation projects, but will there be any type of data analysis / trend analysis? Ex: performance metrics included in the Quarterly Data Report.

RESPONSE:

6.a. Section 8.2.1.1 provides the following covered conduction replacement schedule:

- Holcomb 4kV (North Shore Big Bear City Area): 4.5 circuit miles planned for 2026.
- Boulder 4kV (Boulder Bay Area): 3.5 circuit miles planned for 2026.
- North Shore 4kV (Fawnskin Area): 2 circuit miles planned for 2027.
- Pioneer 4kV (Baldwin Lake Area): 8 circuit miles planned for 2027.
- North Shore 4kV (Fawnskin Area): 4 circuit miles planned for 2028.
- Boulder 4kV (Boulder Bay Area): 3 circuit miles planned for 2028.
- Clubview 4kV (Moonridge Area): 3 circuit miles planned for 2028.

This 2026-2028 plan and sequence was based on prioritizing the higher risk areas as determined by the Technosylva Fire Sight asset model. BVES does not have Gantt charts available for this project. Approximately 5-6 months prior to each upcoming calendar year, BVES assigns a contractor to begin the design phase for the next year's Covered Conductor projects. This process includes identifying specific circuit locations and determining the corresponding circuit miles planned for installation.

6.b. Yes, BVES utilizes outage data for Tables 2, 5, and 6 of the Quarterly Data Report (QDR) to evaluate system performance. The data is reviewed to identify any unusual trends, which are then analyzed to assess the effectiveness of mitigation measures and guide continuous improvement efforts.

7. Table 6-3 (Pg 89)



- a. Section 6.2.1.2 of the Energy Safety WMP Guidelines requires the utility to calculate expected % risk reduction. Are the expected % risk reduction values recorded in Table 6-3 of the BVES 2026-2028 Base WMP intending to comply with the requirements in Section 6.2.1.2? If so, explain how?
 - i. Why are the "Expected % Risk Reduction" column values equal to the values provided in column "Activity Effectiveness - Overall Risk". Is BVES stating that these mitigations lower the overall risk to zero?
- b. Answer the following questions related to Table 6-3:
 - i. Explain why energy storage and solar energy would have an 18 percent Activity Effectiveness - Overall Risk.
 - ii. Explain why GD_1 (Covered Conductor) has only 5.8 percent mitigation effectiveness. SPD understands other utilities often estimated covered conductor to be ~60 percent effective.
 - iii. Explain why the mitigation effectiveness for undergrounding is only 4.9%? If this number is low because of limited scope of undergrounding, please explain.
 - iv. Provide datasets that support BVES's calculation of the percent mitigation effectiveness for energy storage, solar energy, covered conductor and undergrounding.
- c. Section 6.2.1.2 of the Energy Safety WMP Guidelines states that "(t)he electrical corporation must also provide a step-by-step calculation showing how it derived the values provided [in Table 6-3]". Provide additional clarification to back up the overall low numbers / possible over estimations for Activity Effectiveness - Overall Risk and Expected % Risk Reduction.

RESPONSE:

7.a. As explained in the Activity Effectiveness subsection of Section 6.2.1.2 of BVES's 2026 – 2028 Base WMP, Activity Effectiveness values are calculated in accordance with the expected risk reductions for wildfire and PSPS risks. Those values are then averaged to generate total risk reduction values to comply with the WMP Guidelines.

7.a.i. Since, according to the Activity Effectiveness subsection of Section 6.2.1.2 of BVES's 2026 – 2028 Base WMP, Activity Effectiveness is calculated in the same way that the WMP Guidelines instruct expected percent risk reduction to be calculated, it is entirely expected that Activity Effectiveness – Overall Risk will be identical to Expected Risk % Reduction. It is not clear to BVES why SPD would expect that to mean that these mitigations would lower risk to zero.

7.b.i. The risk reduction reported in Table 6-3 energy storage (GD_7) and solar energy (GD_6) is for PSPS risk using the Risk Register model. See response to 6.b.iv. for the calculations.

7.b.ii. The risk reduction of 5.8 percent is the annual overall risk reduction due to executing the initiative GD_1 (Covered Conductor).

7.b.iii. The risk reduction 4.9 percent is the annual overall risk reduction due to executing the initiative GD_2 (Undergrounding).

7.b.iv. The risk reductions noted in Table 6-3 were developed using Risk-Based Decision-Making Framework that aligns with the safety model approach for Small and Multi-Jurisdictional Utilities (SMJU) provided in CPUC D.19-04-020 issued May 6, 2019. This approach to risk management includes the basic

tenets of the International Standardization Organization's "Risk Management – Principles and Guidelines" ("ISO 31000"). In the WMP, BVES refers to this as the "Risk Register" model.

This Risk Register evaluates the enterprise risk reduction relative to the cost of the mitigation using the Risk Spend Efficiency (RSE) analysis. This analysis focuses on a review of ongoing and potential new projects to mitigate the primary risk event, which in this case is "Wildfire – Threats to Public Safety." The enterprise risk evaluation considers a reasonable worst-case scenario for the primary risk event. For each primary risk event, BVES determined the frequency of occurrence and impact scores using a qualitative risk assessment tool that utilizes a 7x7 logarithmic score matrix to assess risk based on the following factors:

- Personal and public safety
- System reliability impacts
- Regulatory compliance and legal implications
- Quality of service to customers
- Environmental impacts

Once likelihood and consequence are assigned values, risk (Wildfire and PSPS) is calculated using the following formula:

$$\text{Risk score} = \sum_{i=1}^n \text{weight}_i * \text{frequency}_i * 10^{\text{impact}_i}$$

For the Energy Storage Project (Tracking ID: GD_7), the risk calculation is as follows:

				Risk Addressed:		PSPS (Loss of Energy)		Risk ID		F			
WMP Initiative Category		Grid Design, Operations, and Maintenance			Risk Reduction:		167,774						
Utility Initiative Name		Bear Valley Energy Storage Project											
Utility Initiative Tracking ID		GD_7											
Period:		2027	Duration (years)		1		Un-Mitigated Scores						
Description:		Development and deployment of microgrids that may reduce the risk of ignition, risk from PSPS, and wildfire consequence. "Microgrid" is defined by Public Utilities Code section 8370(d). BVES proposes to construct an energy storage project of approximately 5 MW/20 MWh (four-hour) Lithium-Ion NMC utility-grade battery located in the BVES			Frequency	Reliability	Compliance	Quality of Service	Safety	Environmental	Impact Score	Risk Score	
Cost			Funding Type		5	6	6	7	6	4	6.2	929,603	
(Low):		\$10,837,621	CAPEX		Score Weighting								
(High):			Other		12.1%	17.1%	7.2%	60.5%	3.1%				
			Source <td>Other</td> <td colspan="7"></td>		Other								
Percent Completed or Implemented:		0%	Comments			Mitigated Scores							
						Frequency	Reliability	Compliance	Quality of Service	Safety	Environmental	Impact Score	Mitigated Risk Score
Mitigation converted to control:						5	2	2	7	6	1	6.1	761,829
No						7.0	9.8	414093.2	347718.4	0.2			

Once overall risk reduction is known, it is divided by the unmitigated risk score to get the annual risk reduction percentage.

For the Solar Energy Storage Project (Tracking ID: GD_6), the risk calculation is as follows:

				Risk Addressed:		PSPS (Loss of Energy)		Risk ID		F	
WMP Initiative Category		Grid Design, Operations, and Maintenance		Risk Reduction:		167,774					
Utility Initiative Name		Bear Valley Solar Energy Project									
Utility Initiative Tracking ID		GD_6									
Period:		2027	Duration (years)		1						
Description:		Development and deployment of microgrids that may reduce the risk of ignition, risk from PSPS, and wildfire consequence. “Microgrid” is defined by Public Utilities Code section 8370(d). BVES proposes to construct the Bear Valley Solar Energy Project (BVSEP), 5 MW alternating current single-axis tracker solar generation facility to be		Un-Mitigated Scores							
				Frequency	Reliability	Compliance	Quality of Service	Safety	Environmental	Impact Score	Risk Score
				5	6	6	7	6	4	6.2	929,603
				Score Weighting							
Cost (Low): (High):		Funding Type		CAPEX		Other					
				Other							
				Source		Other					
Percent Completed or Implemented:		0%	Comments								
Mitigation converted to control:											
No											

				Risk Addressed:		Wildfire - Public Safety		Risk ID		A	
WMP Initiative Category		Grid Design, Operations, and Maintenance				Risk Reduction:		50,670			
Utility Initiative Name		Minor Undergrounding Upgrades Projects									
Utility Initiative Tracking ID		GD_2									
Period:		Ongoing	Duration (years)		Ongoing						
Description:		Actions taken to convert overhead electric lines and/or equipment to underground electric lines and/or equipment (i.e., located underground and in accordance with GO 128).									

$$\text{Expected Percent Risk Reduction} = 100\% * (\text{2025 Overall Utility Risk} - \text{2026 Overall Utility Risk}) / \text{2025 Overall Utility Risk}$$

The Fire Safety Circuit Matrix risk scores are calculated using the methodology described in Section 5.2.2.3 of BVES's 2026 – 2028 Base WMP, on pages 47 – 50.

9. Section 7 - PSPS

- a. Since BVES is in an HFTD Tier 2 area where there are many potential hazards for wildfires, how has BVES never experienced conditions that would equate to a PSPS triggering event? Does BVES track a close call database that would show times where PSPS events were almost implemented? If so, provide SPD with a copy of this database.
- b. Does BVES have a database of the SCE initiated PSPS events that impacted BVES customers?
 - i. If so, provide a list of SCE initiated PSPS events that have impacted BVES customers over the past five years (2020-2025). In the WMP workshop it was mentioned that PSPS events initiated by SCE have impacted BVES final customers.
 - ii. In cases where PSPS events initiated by SCE impacted BVES customers (for example on January 25, 2025), provide an explanation of alternating power generation facility sources that are activated in order to counteract the loss of power. Provide a list of required activations of the Peaker plant / etc. that was mentioned in the WMP workshop.

RESPONSE:

9.a Simply put, BVES has not experienced the environmental and weather thresholds that would trigger a PSPS event.

BVES is a winter-peaking utility serving a region located approximately 6,700 feet in elevation in the San Bernardino Mountains. To initiate a Public Safety Power Shutoff (PSPS) de-energization, multiple critical indicators must be present, including fuel moisture levels, humidity, and wind speed. Although the Big Bear Valley occasionally experiences high-wind events, these are generally accompanied by weather systems that bring snow or rain, reducing wildfire risk. Additionally, high Santa Ana winds in the San Bernardino and Victorville valleys do not consistently translate into high winds in the higher elevations where BVES operates.

BVES continuously monitors all variables that influence PSPS decision-making. To date, BVES has not initiated a PSPS de-energization within its service area. The utility's infrastructure is specifically rated for performance in high-elevation environments and includes design considerations for snow loading and other relevant factors. BVES also collects and tracks weather-related data to support PSPS planning and readiness.

BVES runs its FPI and WFA-E (fire behavior index) risk model along its circuits daily to evaluate

the need to PSPS. BVES has never experienced the thresholds that would trigger a PSPS.

BVES does not maintain a close call database that would show times where PSPS events were almost implemented.

9.b BVES does not maintain a dedicated database for PSPS events initiated by Southern California Edison (SCE). In the event of a complete power loss in Big Bear Valley resulting from an SCE-initiated PSPS affecting both the Bear Valley and Goldhill SCE feeders, BVES has access to only 8.4 MW of local generation capacity from the natural gas-powered Bear Valley Power Plant. To enhance local resiliency during such events, BVES has submitted an application to the California Public Utilities Commission (CPUC) requesting approval to construct a 5 MW solar facility and a 5 MW utility-owned battery energy storage system. These projects aim to provide improved reliability to the community during PSPS activations.

10. Section 8 - Grid Design, Operations, and Maintenance

- a. Provide a detailed calculation showing how BVES calculated the risk reduction in Table 8-1 for the three included years for the following projects:
 - i. Covered Conductor Installation (Tracking ID: GD_1)
 - ii. Undergrounding (Track ID: GD_2)

RESPONSE:

10. The risk reductions noted in Table 8-1 were developed using Risk-Based Decision-Making Framework that aligns with the safety model approach for Small and Multi-Jurisdictional Utilities (SMJU) provided in CPUC D.19-04-020 issued May 6, 2019. This approach to risk management includes the basic tenets of the International Standardization Organization's "Risk Management – Principles and Guidelines" ("ISO 31000"). In the WMP, BVES refers to this as the "Risk Register" model.

This Risk Register evaluates the enterprise risk reduction relative to the cost of the mitigation using the Risk Spend Efficiency (RSE) analysis. This analysis focuses on a review of ongoing and potential new projects to mitigate the primary risk event, which in this case is "Wildfire – Threats to Public Safety." The enterprise risk evaluation considers a reasonable worst-case scenario for the primary risk event. For each primary risk event, BVES determined the frequency of occurrence and impact scores using a qualitative risk assessment tool that utilizes a 7x7 logarithmic score matrix to assess risk based on the following factors:

- Personal and public safety
- System reliability impacts
- Regulatory compliance and legal implications
- Quality of service to customers
- Environmental impacts

Once likelihood and consequence are assigned values, risk (Wildfire and PSPS) is calculated using the following formula:

$$\text{Risk score} = \sum_{i=1}^n \text{weight}_i * \text{frequency}_i * 10^{\text{impact}_i}$$

For Covered Conductor Installation (Tracking ID: GD_1), the risk calculation is as follows:

				Risk Addressed:		Wildfire - Public Safety		Risk ID		A																	
WMP Initiative Category				Grid Design, Operations, and Maintenance		Risk Reduction:		1,260,541																			
Utility Initiative Name				Covered Conductor Replacement Project (Reconductor)																							
Utility Initiative Tracking ID				GD_1																							
Period:				2021-2035		Duration (years)		14																			
Description:				Installation of covered or insulated conductors to replace standard bare or unprotected conductors (defined in accordance with GO 95 as supply conductors, including but not limited to lead wires, not enclosed in a grounded metal pole or not covered by: a “suitable protective covering” (in accordance with Rule 22.8), grounded metal conduit, or grounded metal sheath or shield). In accordance with GO 95, conductor is defined as		Un-Mitigated Scores																					
						Frequency		Reliability		Compliance		Quality of Service		Safety		Environmental		Impact Score		Risk Score							
						4		6		7		7		7		7		6.9		1,626,498							
Cost (Low):				\$4,665,705		Funding Type		CAPEX				Score Weighting		12.1%		17.1%		7.2%		60.5%		3.1%					
Cost (High):								Other																			
						Source		In Rates																			
Percent Completed or Implemented:				35.0%		Comments						Mitigated Scores															
												Frequency		Reliability		Compliance		Quality of Service		Safety		Environmental		Impact Score		Mitigated Risk Score	
Mitigation converted to control:												3		5		6		6		7		6		6.8		365,958	
No												700.1		9845.2		4161.8		349470.2		1780.4							