

Bear Valley
Electric Service, Inc.
A Subsidiary of American States Water Company

Safety and Operations Committee Board Level Brief to CPUC and OEIS

Paul Marconi, President, Treasurer, Secretary, & Safety Committee Chairman

July 6, 2023

Outline

- System Overview
- Safety Governance Model
- Safety Committee Topics & Recommendations
- Safety Performance
- WMP Implementation Progress
- 2021 & 2022 SCA Recommendations Progress
- New, Lower-cost Technologies

Service Area Overview

Location: 32 square miles of rural and mountainous terrain at approximately 7,000 ft. in San Bernardino Mountains (80 miles East of Los Angeles).

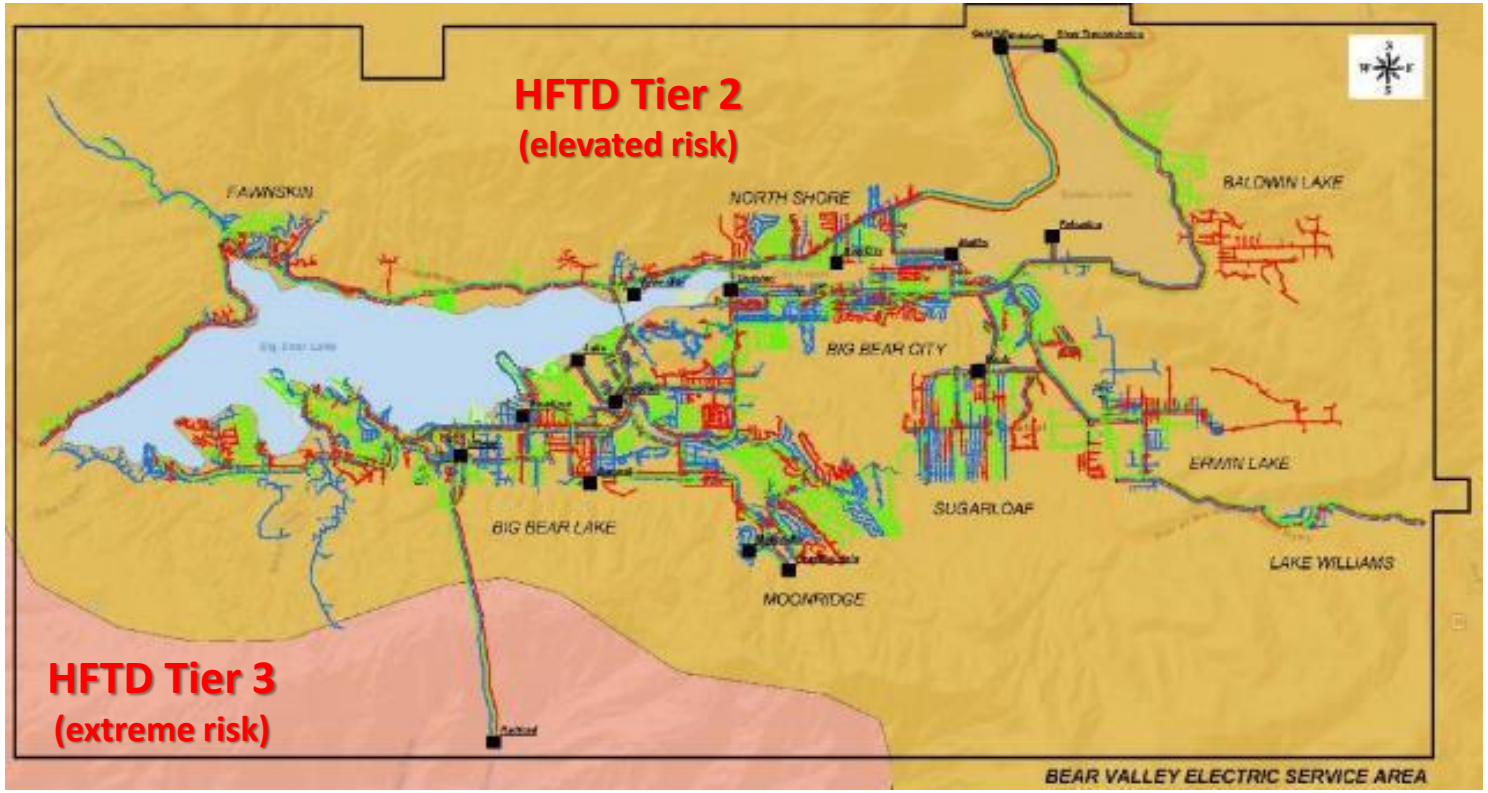
- Entire Service Area is > 3,000 ft. elevation requiring more resilient construction standards.

Key jurisdictions: County of San Bernardino, City of Big Bear Lake, U.S. Forest Service, CALTRANS

Customers: 24,739 total [23,238 residential and 1,501 commercial].

Electrical System:

- Transmission – BVES does not own or operate any transmission systems (66 kV or greater).
- Sub-transmission (34.5 kV)
  - 13.2 circuit miles bare overhead conductor
  - 15.8 circuit miles covered overhead conductor
  - 0.9 circuit miles underground
- Distribution (4 kV)
  - 153.1 circuit miles bare overhead conductor
  - 28.4 circuit miles covered overhead conductor
  - 53.2 circuit miles underground
- Substations: 13
- Supply Lines: 39 MW total
- Bear Valley Power Plant: 8.4 MW
- 551 NEM + DGS customers
- Load is winter & evening peaking
  - Historical peak: 46 MW (2021)
  - Load delivered: 142,421 MWh (2022)
  - 39% qualified to Renewable Portfolio Standards



Safety Governance Model

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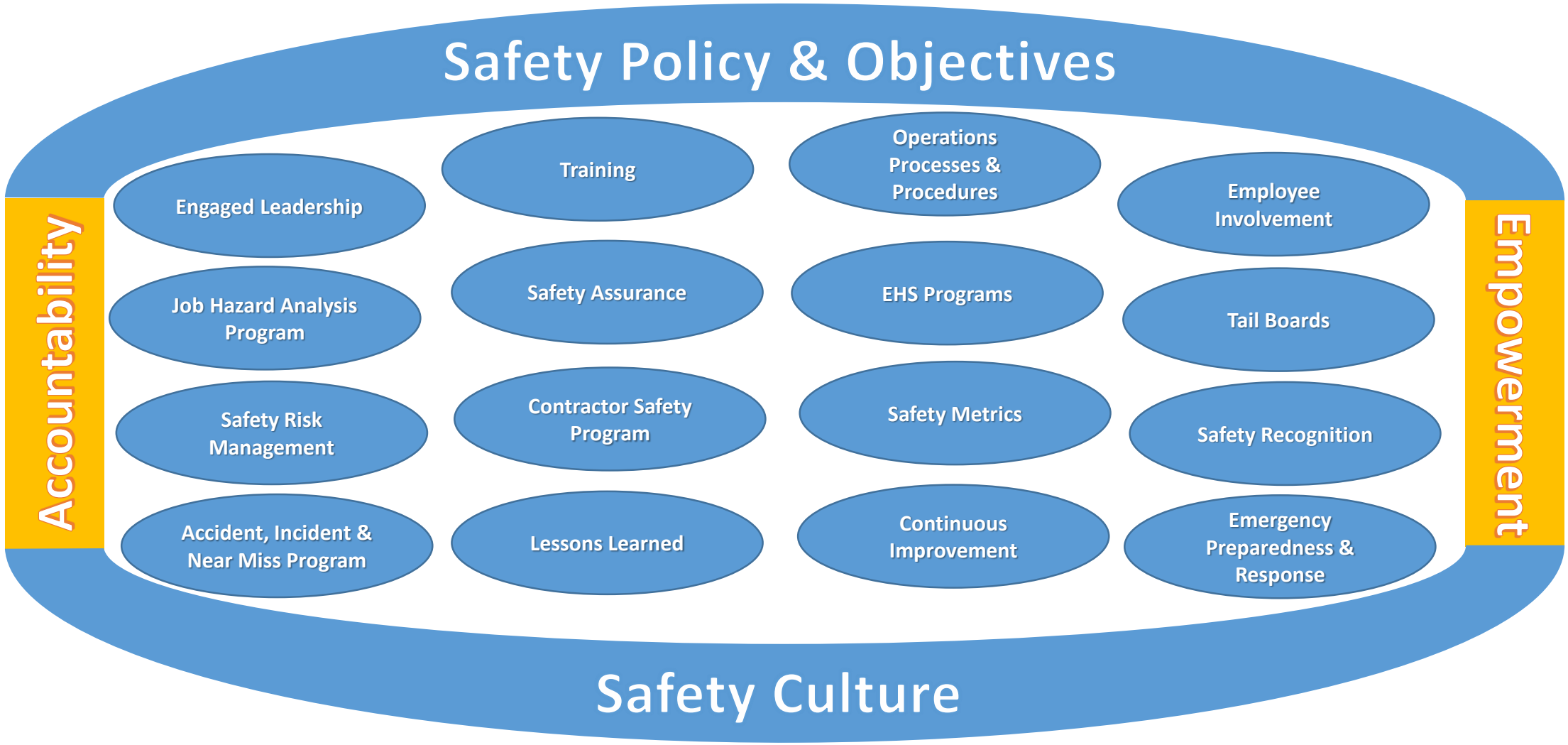

Safety Committee Topics & Recommendations

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Last 12 Months Topics & Recommendations Include:

- Approved adjustments to 2022 WMP capital expenditures.
- Approved 2023-2025 WMP initiatives and targets.
- Approved 2023 WMP capital expenditures and WMP O&M initiatives expenses.
- Approved Management's recommendation to implement 2022 Safety Culture Assessment recommendations.
- Briefed in detail each quarter on WMP initiatives, targets and progress, and challenges.
- Briefed in detail each quarter on safety performance.
- Briefed in detail each quarter on risk modeling improvements performed at the utility.

12 Months Prior Outcomes Include:

- BVES achieved 2021 and 2022 WMP Update initiative targets.
- Significantly improved risk modeling capabilities.
- Strong public safety record in 2022.
- Significant progress in grid hardening, situational awareness, inspection, vegetation management and emergency response preparedness (includes PSPS).

Safety Performance

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As of June 26, 2023, BVES's Safety Record:

- Zero ignitions in over 20 years.
- Zero public injuries or fatalities due to BVES facilities or operations in over 20 years.
- 286 days accident/injury free (1 reportable injury in last 4 years).
- Zero employee fatalities in over 20 years.
- Zero employee contact with High Voltage in over 10 years.

Be
Vigilant about
Emphasizing
Safety in all that we do!

MONTHLY DASHBOARD — MAY 2023

	YTD	Past 10 YR
Fatalities	0	0
Employee Contact with High Voltage	0	0
Ignitions	0	0
Motor Vehicle Accidents	0	
Near Misses	0	
Live Wire Down Events	0	
Vegetation Contact with Bare Conductor	5	

*Note: No vegetation contacts were during high fire risk conditions

Wildfire Near Miss Events	0
SAIDI	27.1

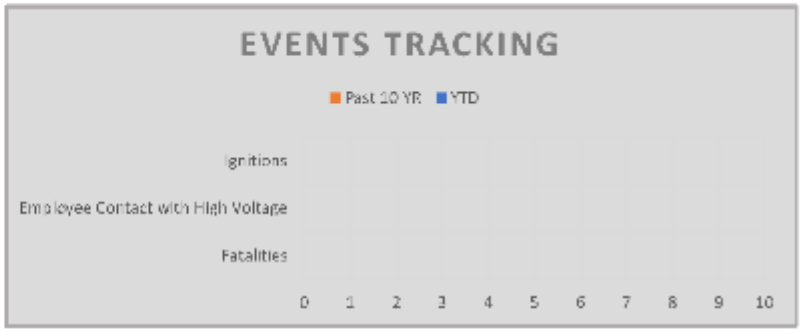
Bare Wire	Percent
4 kV (Was 77.4% on 12/31/2019)	65.9
34 kV (Was 97.0% on 12/31/2019)	46.9

ACCIDENT and INJURY FREE DAYS: 260

TRAINING SCHEDULE

June	Electrical Safety
July	Emergency Action Plan

SAFETY ISSUES



SAFETY MESSAGE:

Near Miss Reporting

All near miss incidents (and minor incidents) are to be reported, recorded, and investigated. Sharing this information allows opportunities to answer what happened and determine how to prevent reoccurrences.

Importance of Tracking Near Misses:

Near Misses are a valuable source of information

Near Misses are symptoms of undiscovered safety concerns

Reporting can help identify negative trends and safeguard employees

Identifying Near Misses:

- Unsafe behaviors and/or conditions
- Minor incidents that could have been more serious
- Events where injury, property and/or environmental damage could have occurred

Reporting a Near Miss:

- If a near miss is witnessed, notify your supervisor or Human Resources
- Reporting will NOT result in disciplinary action
- Root cause(s) will be analyzed wil lbe used to improve safety systems, hazard controls, risk reduction, and employee education

WMP Implementation Progress

What have we accomplished:

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Covered Conductors	• Sub-transmission (34 kV): Installed 14.6 circuit miles (55.9% is either covered or underground) and distribution (4 kV): Installed 27.1 circuit miles (34.8% is either covered or underground).
Expulsion Fuses	• Replaced all expulsion fuses (a total of 3,114) with 2,578 current limiting fuses and 536 electronic fuses. There are not expulsion fuses in system.
Pole Loading & Assessment	• Assessed 3,698 poles and replaced or remediated 1,448 poles.
Evacuation route Hardening	• All primary evacuation routes have been hardened. To date installed 1,763 wire mesh wrap on wood poles, replaced 172 wood poles with LWS poles and replaced 66 wood poles with fire resistant composite poles.
Tree Attachment Removal	• Removed 720 tree attachments. 487 tree attachments remain in system and programs for removal.
Advanced Inspection	• Established routing of conducting annual LiDAR, UAV Photography & Videography, UAV Thermography, and 3rd Party Independent Patrols of entire system. These are in addition to GO-165 Detailed & Patrol Inspections. Conducting 850 intrusive wood pole inspections per year.
FLISR	• Installed 10 IntelliRupter Switches on sub-transmission system loop to establish a Fault Localization Isolation and Service Restoration (FLISR) self-healing system.
Grid Automation	• Installed fiber optic network throughout service area (mimics sub-transmission system) and fully automated three substations.
Substation Upgrades	• Completed technical and safety updates to the Pineknot Substation and the Palomino Substation.
Risk Modeling Capability	• Developed full field effect wildfire probability and consequence maps for 2021 & 20250 (REAX Engineering) and implemented Technosylva's Wildfire Analyst Enterprise (WFA-E) and Wildfire Risk Reduction Model (WRRM).
Enhanced Vegetation Management	• Implemented increased radial clearances on all power lines and "blue-sky" requirement on sub-transmission lines. Removed 667 hazard trees.
Weather Stations	• Installed 20 weather stations providing continuous complete and overlapping weather monitoring and weather data recording in a historian with outputs available to BVES staff, BVES's weather consultant, Technosylva's WFA-E models, and to open-source forecasting (NOAA).
ALERTWildfire Cameras	• Installed 15 Cameras in 7 locations in the ALERTWildfire High Definition Camera system providing complete and overlapping coverage of the entire BVES service area and surrounding boundary areas.

WMP Implementation Progress

WMP Initiatives are making a measurable difference:

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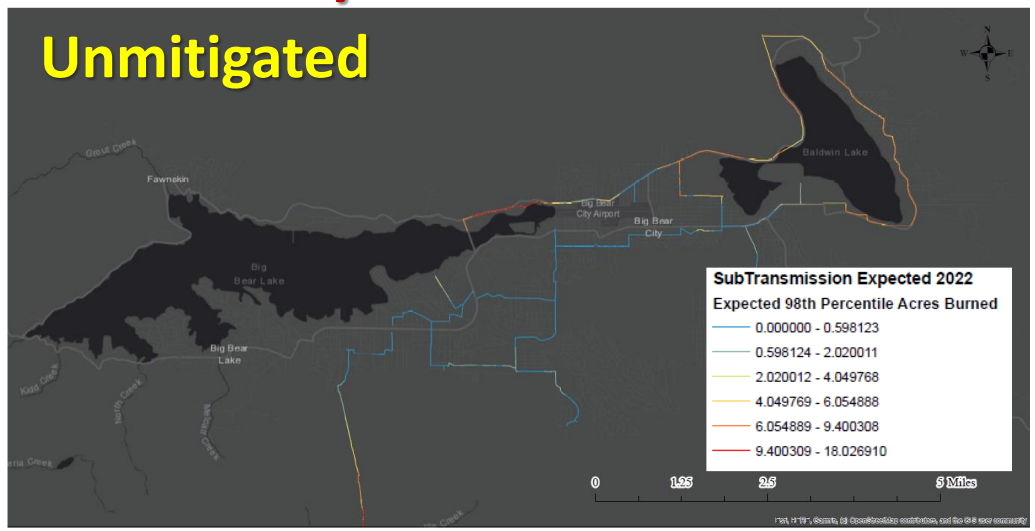
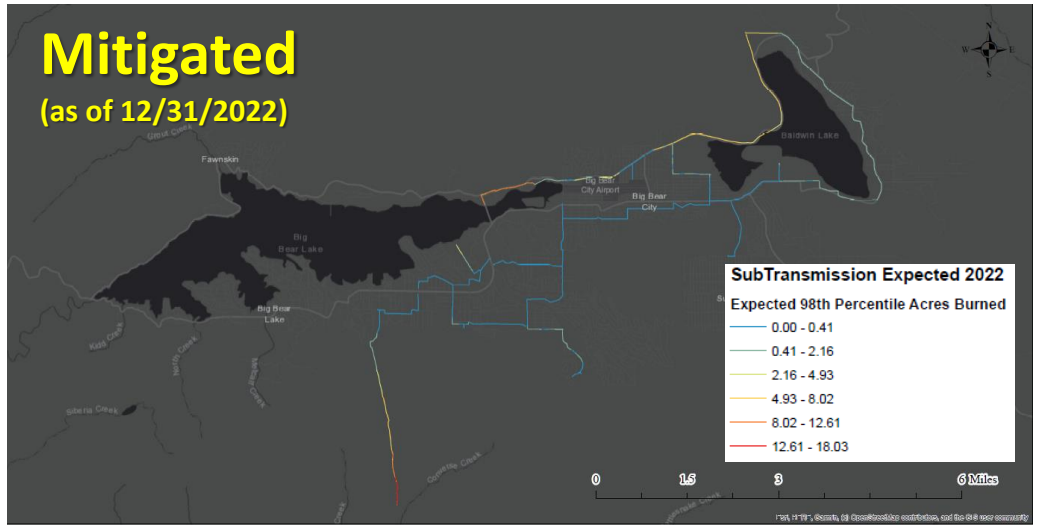
WRRM Analysis





Fire Safety Model Analysis

Date	System Risk Units
12/31/2019	115,969
12/31/2020	110,745
12/31/2021	90,386
12/31/2022	81,829
12/31/2023	44,891*
12/31/2025	31,535*
12/31/2032	9892*

*Projected risk score base on planned initiatives.

Vegetation density in right of ways has been significantly reduced (as measured by LiDAR):

2020: 25.44%

2022: 20.17%

WMP Implementation Progress

WMP Initiatives are increasing capability:

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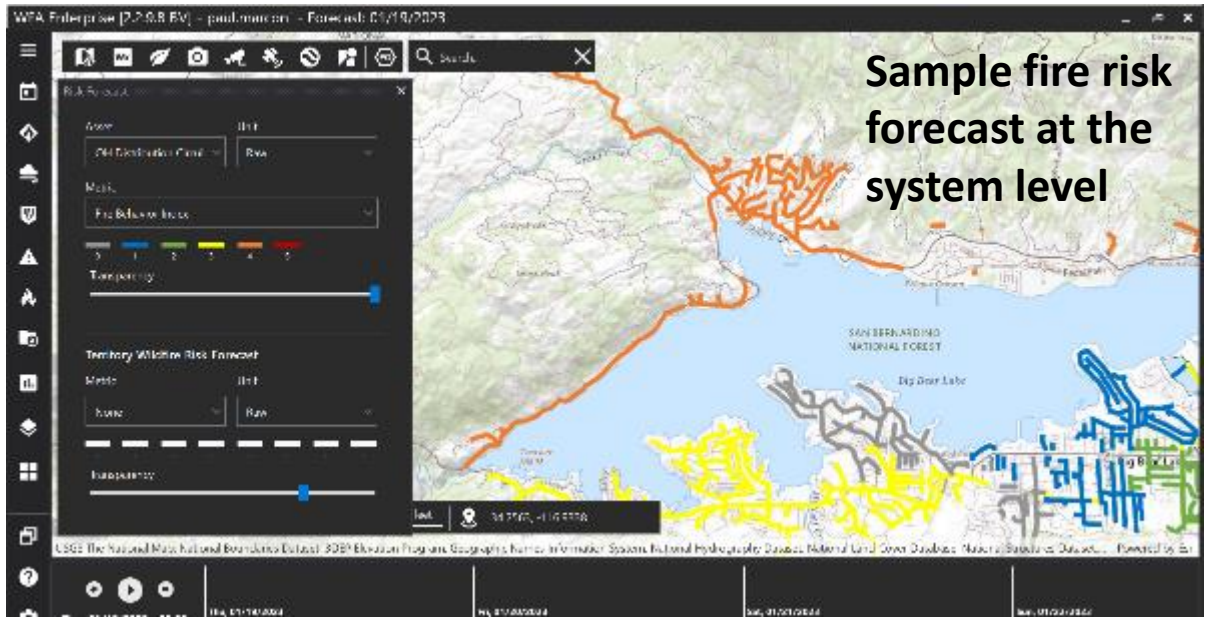
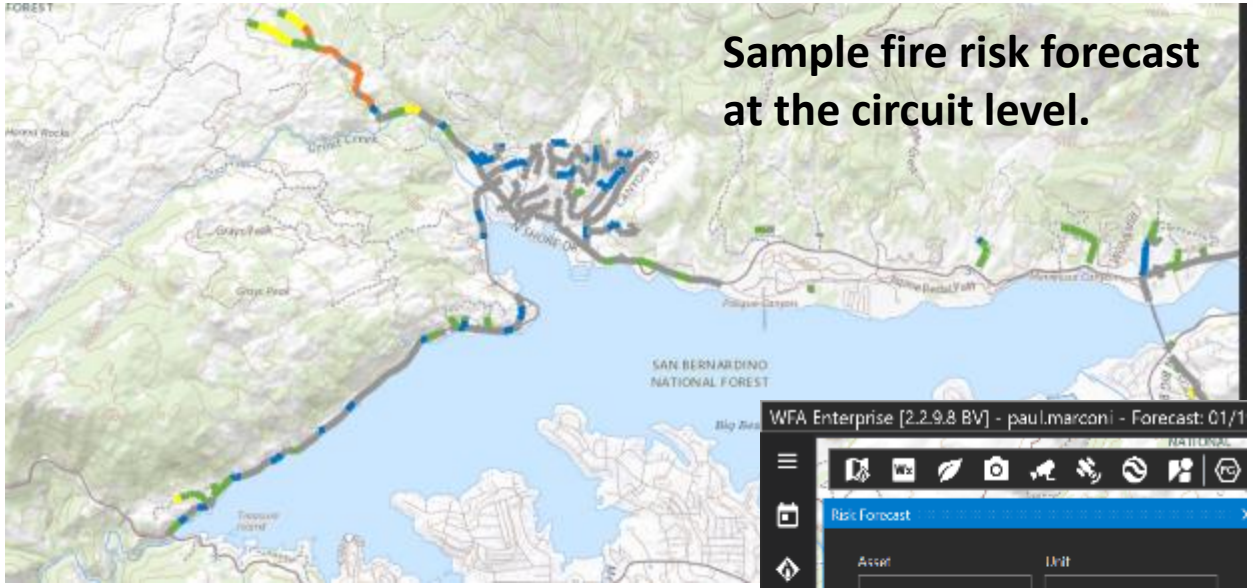
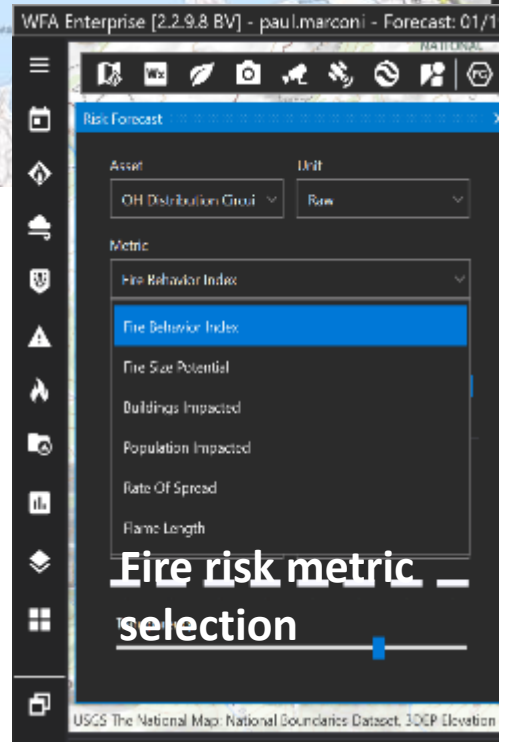




- BVES began utilizing Technosylva's WFA-E application in 2022 greatly enhancing its near real time forecasting and modeling capabilities with respect to wildfire risk.
  - Real time weather and wildfire risk data is processed to provide a risk forecast.
  - BVES staff can now perform fire spread predictions based on the fire risk forecast.
- The fire model is expected to reach a confidence level of 60%.
  - Validation is usually done using satellite products and/or known fire perimeters where the uncertainty is known to be within a range.
- Technosylva is developing a BVES specific Fire Potential Index (FPI.



WMP Implementation Progress

What grid hardening is planned 2023-2025 WMP:

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Covered Conductors
Replaces 4.3 circuit miles of 34 kV bare wire & 8.6 circuit miles of 4 kV bare wire with covered conductors each year.

Radford Line Replacement Project
Replaces 2.8 circuit miles of bare wire sub-transmission line & 95 wood poles, with high-performance covered conductor and ductile iron poles in HFTD Tier3 area.

Tree Attachment Removal Project
Removes 100 tree attachments each year.

Evacuation Route Hardening Project
Hardens 500 poles each year along road ways leading to evacuation routes.

Substation Automation
Automates 3 substations per year (3-year project).

Capacitor Bank Upgrade Project
Replaces 6 capacitor banks with automated capacitor banks connected to SCADA each year (4-year project).

Switch and Field Device Automation
Connects and automates 28 34 kV and 20 4 kV switches to SCADA network over 4 years.

Partial Safety & Technical Upgrades Maltby Substation
Replaces overhead type regulators with pad mounted regulators, installs IntilliRupter Switches, & converts substation to all pad mounted dead front equipment.

Safety & Technical Upgrades to Lake Substation
Converts substation to all pad mounted dead front equipment – complete equipment upgrade.

Online Diagnostic System
Installs system on at least one circuit each year.

Partial Safety & Technical Upgrades Village Substation
Replaces overhead type regulators with pad mounted regulators, installs IntilliRupter Switches, & converts substation to all pad mounted dead front equipment.

Energy Storage Project
Installs a 5 MW/20 MWh (four-hour) Lithium-Ion NMC utility-grade battery at BVES.

Bear Valley Solar Energy Project
Constructs 5 MW AC/6.1 MW DC single-axis tracker solar generation facility connected to BVES's sub-transmission system.

Fuse TripSaver Automation
Connects and automates 160 fuse TripSavers to SCADA network over 4 years.
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Install Fault Indicators
Connects 134 fault indicators into SCADA.

WMP Implementation Progress

What inspections/quality controls are planned 2023-2025 WMP:

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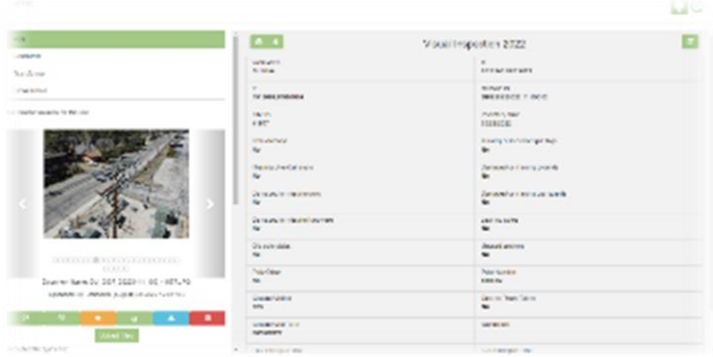

- Patrol Inspections
- Detailed Inspections
- Intrusive Pole Inspections
- UAV Thermography
- UAV HD Photography/Videography
- LiDAR Inspection
- 3rd Party Ground Patrol
- Substation inspections
- Asset management, vegetation management, and inspection enterprise system(s)
- Asset quality assurance/quality control
- Vegetation management quality assurance/quality control

2021 SCA Recommendations

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Recommendation	Actions
Embed leadership skills development into the "Engaged Management" 12-month objective to improve the safety culture.	Provided training & coaching to managers and frontline supervisors on how to achieve safety culture improvements through open communications, listening, taking action on employee's concerns, setting the "high standards" example, and constantly emphasizing the important role their employees have in public safety. Leadership engages in open dialog with employee representatives at monthly management-employee safety committee meetings. Safety performance is the top line on all manager and supervisor appraisals. Performance metric goals have been set.
In collaboration with **vegetation management contractor**, develop and implement an **action plan to address safety culture issues**.	Discussed issue with the vegetation contractor's CEO, Operations Manager, and Safety Group. Worked closely with vegetation contractor to implement a specific plan was in place to improve information flow among contractor employees and between contractor employees and supervisors about wildfire hazards. Vegetation Contractor conducted training with crews and then examined the effectiveness of the training through an internal safety culture survey, which showed significantly improved results. BVES meets with the vegetation contractor's field crews on a weekly basis to discuss safety issues, pass on safety and wildfire mitigation lessons learn, and improve situational awareness of operations and the environment (e.g., discuss high fire threat weather).

2022 SCA Recommendations

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Recommendation	Actions
Refine strategic improvement plan to address gaps in contractor safety culture. Improve contractor relationships & empower contractors to address problems. Builds upon a 2021 SCA recommendation.	Refining strategic improvement plan to address gaps in overall safety culture for contractors. Working with contractors to understand why they have lowered their opinion about safety culture and implement specific measures to address their concerns. Implementing formal contractor safety program that includes improvements to onboard, train, and otherwise engage contractors in its strategic plan. BVES will engage BVES supervisors to listen to, support, and empower contractors.
Implement plan to address survey result indicating Design & Construction employees have a less positive experience of safety culture in wildfire mitigation work context than other employees.	Senior management conducting interviews with Design & Construction employees to further gage their safety culture views and refine plan to improve their safety culture. Senior management & supervisors will work with Design & Construction employees to address their concerns; especially in the areas of the lower performing survey statements. Supervisors will reinforce the elements that promote improved safety culture and safety related communications.

2022 SCA Recommendations

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Recommendation	Actions
Strengthen safety-enabling systems by improving protocols for responding to near misses & hazards. Build upon the "Continuous Improvement Program" to improve employee understanding of the importance of submitting near-miss reports.	Senior management led companywide training on "near miss" and "hazard" reporting. Senior management to encourage "near miss" and "hazard" reporting by directly engaging supervisors & rewarding employees that make meaningful "near miss". Document & track number of safety event reports submitted by employees on a monthly basis. Management will include an assessment of the quality of these reports, any trends identified, and actions taken to improve safety based on the reports.
Implement use of specific leading indicators to improve safety & health outcomes in connection with its 12-month goal to establish, collect, and publish a set of safety metrics, including leading indicators, to evaluate safety.	BVES will track the following leading indicators: safety training completion rate, # of pre-job briefs, # of JHAs performed, # of VM QCs performed, # of WMP work QCs performed, # of near misses, and # of contractor/BVES meetings on safety items. Leading indicators are discussed at monthly employee-management safety committee meetings. Leading indicators will be included in monthly safety dashboard email to employees. Supervisors discuss leading indicators with employees. Supervisors discuss leading indicators with contractors.

New, Lower-cost Technologies

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Online Diagnostic System

- Project installs continuous monitor sensors to provide usable grid insight information that is measured, reported, and documented.
  - Analytics enable the ability to identify and correct current and future irregularities before a problem arises.
  - Designed to pinpoint irregularities, which may be due to degrading/imminent hardware failures, as well as identify objects such as vegetation contacting the lines.
  - Enables BVES to rapidly inspect potential problems before they develop into an ignition source.
- This initiative intends to help mitigate the potential for fire exposure of high-risk circuits not poised to be replaced with covered conductors in the immediate future, due to the current program schedule or other constraints.

Status:

- Contractor installed 15 sensors on 4 kV and 34 kV lines and 4 communication gateways in select locations optimized for data backhaul.
- Contractor is grooming monitoring equipment.
- Next step is staff training and system implementation.

Fire Season Ahead

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Goldmine Fire

- Vegetation fire reported at about 1:30 p.m. on June 29, 2023.
- Response was rapid and crews were mopping up the fire scene just before 4 p.m.
- Cause under investigation.
- Perhaps the beginning of an active fire season.

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Questions