

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

Safety and Operations Committee Board Level Brief to CPUC and OEIS

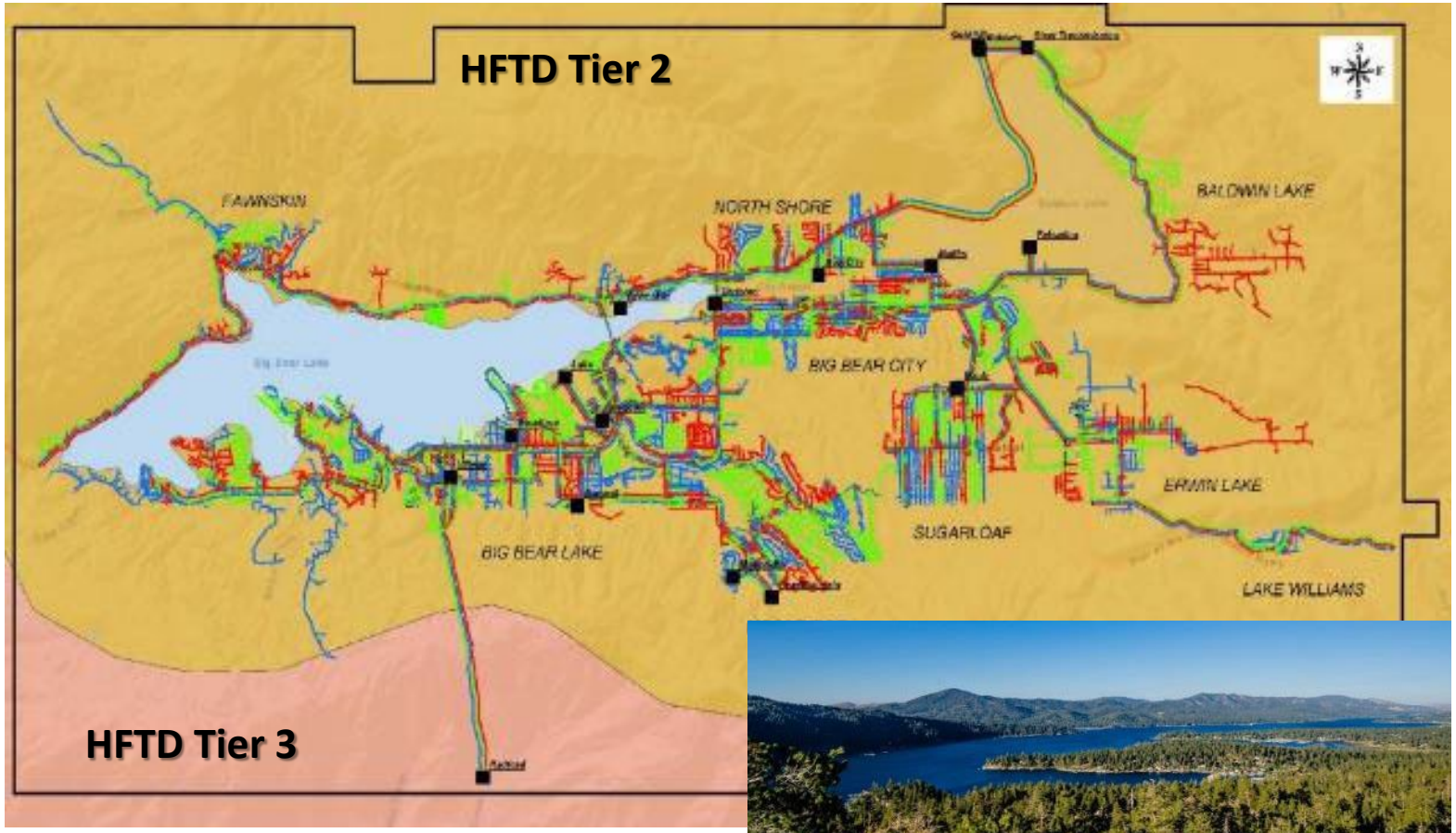
September 14, 2022

Paul Marconi, President & Safety Committee Chairman, BVES, Inc.

Outline

- Safety governance update
- Monitoring safety performance
- Key priorities and efforts to improve safety and operational performance
- Recent safety outcomes achieved and goals
- Primary challenges to improving safety performance
- Key lessons learned
- Climate change modeling and safety decision-making
- Safety culture assessment recommendations

Service Territory 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).

- Heavy vegetation density and mostly dry environment (80.5%).
- Entire Service Territory in High Fire Threat District (Tiers 2 & 3).
- Entire Service Territory in Heavy Loading District (>3,000 ft.).

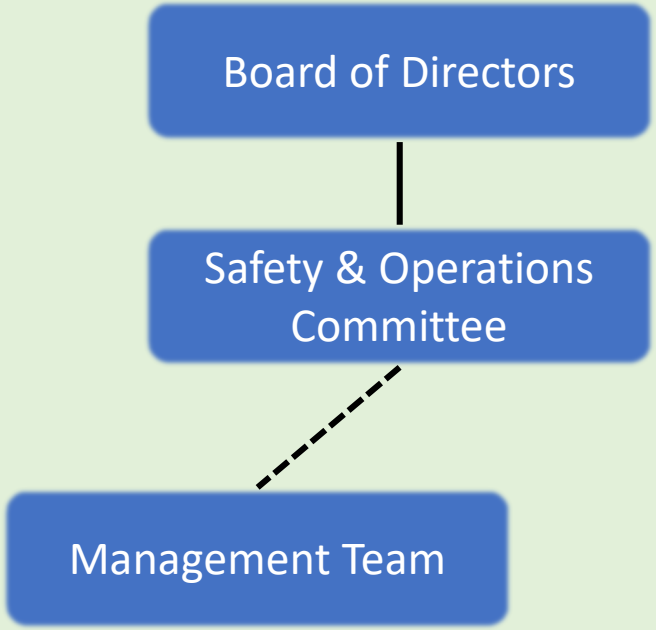
Key jurisdictions: County of San Bernardino, City of Big Bear Lake, U.S. Forest Service.

Customers: 24,651 total [23,144 residential and 1,507 commercial].

Power Supplies: BVES system is entirely within the balancing area under the control of the California Independent System Operator. Supply lines to BVES are owned and operated by Southern California Edison.

Organization

Bear Valley Electric Service, Inc.



Safety & Operations Committee is responsible for overseeing:

- Preparation of BVES's wildfire mitigation plan and the assessment of BVES's compliance with the plan,
- Other activities intended to identify wildfire risks and other safety risks related to the operation and maintenance of the BVES electric utility system,
- Steps taken to reduce such risks and to respond to safety events, and
- Such other matters as set forth in the charter or delegated to the Committee from time to time by the Board.

Board-level Accountability of Executives

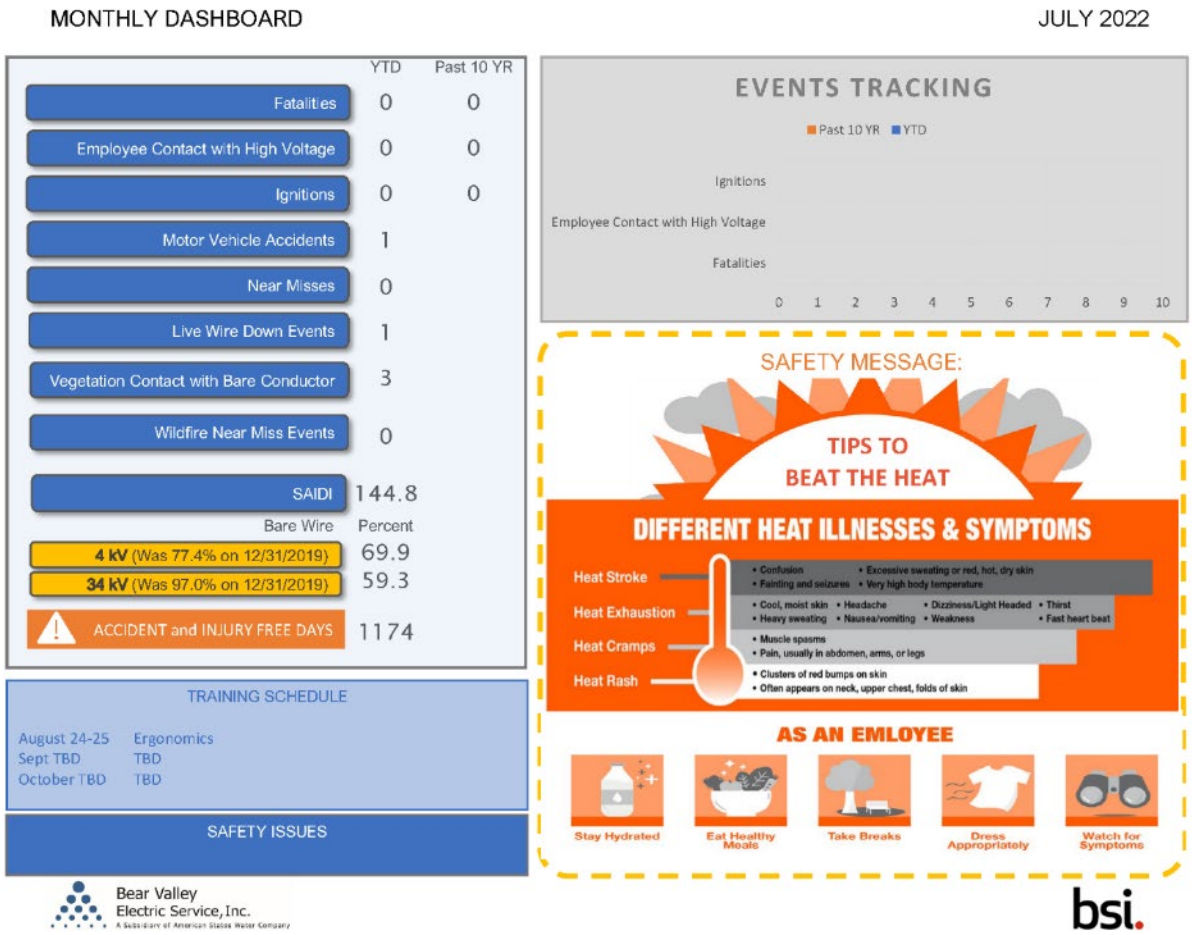
- Executive Officer performance is accountable to and subject to control of the Board of Directors.
  - Accountability is absolute.
  - Authority, responsibility, and resourcing commensurate with accountability.
- Executive Compensation Plan is designed to promote public safety and financial stability. The Plan is structured to:
  - Promote safety as a priority.
  - Ensure public safety.
  - Ensure financial stability of the utility.
  - Utilize performance metrics that are measurable and enforceable.
  - Allocate the primary portion of the compensation based on achievement of performance metrics that are measurable and enforceable.

Safety & Operations Committee
Summary of Actions & Recommendations

- Approved 2022 WMP Update initiatives and targets.
- Approved 2022 WMP capital expenditures.
- Approved Corporation's Environment, Health, and Safety Policy Statement.
  - Emphasizes public safety.
- Approved Management's recommendation to implement 2021 Safety Culture Assessment recommendations.
- Briefed in detail each quarter on WMP initiatives, targets and progress, and challenges.
- Briefed in detail on risk modeling performed at the utility.
- Conducted tour of WMP work completed and in progress.

Monitoring Safety Performance

- Monthly review and publishing of safety metrics.
  - Briefed to Safety & Operations Committee.
  - Reviewed by Management.
  - Reviewed and discussed at monthly employee-management safety committee meetings.
  - Shared with all employees.
- President briefs all employees every two months on public safety, employee & contractor safety, and WMP initiatives.
- Lessons learned and employee input.
- Celebrate & recognize safety achievements.



Safety Culture Initiatives To Drive Safety and Operations Performance

- Engaged Management – *2021 implemented*
- Active Safety Committee – *2021 implemented*
- Safety Program Properly Resourced – *2021 implemented*
- Safety Training Program – *2022 in progress*
- Leading Indicators – *2022 in progress*
- Continuous Improvement Program – *2022 in progress*
- Safety Recognition Program – *2023 in progress*
- Transparency & Open Communication – *2023 in progress*
- Apply Behavior-Based Safety – *2024 in planning*
- Shared Awareness of the Most Important Risks – *2024 in progress*

Key Priorities & Efforts

- At the tactical level
  - Situational Awareness and Forecasting
  - Grid Design and System Hardening
  - Asset Management and Inspections
  - Vegetation Management and Inspections
  - Grid Operations and Protocols
  - Stakeholder Cooperation and Community Engagement
- At the strategic level
  - Safety Culture
  - Risk Assessment and Mapping
  - Resource Allocation Methodology
  - Data Governance
  - Emergency Planning and Preparedness

Safety Outcomes

Be
Vigilant about
Emphasizing
Safety in all that we do!

As of September 6, 2022, BVES's Safety Record:

- Accident/injury free for 1,203 days.
- No fatalities in over 10 years.
- No employee contact with High Voltage in over 10 years.
- No ignitions in over 10 years.

Risk Reduction as Result of WMP Initiatives

- Executing 84 wildfire mitigation initiatives in 10 categories.
  - Metrics tracking progress are submitted quarterly to Energy Safety.

- Continue to reduce overall risk.
  - Seeking to reduce risk on all “high risk” circuits to eliminate “high risk” circuits.
  - Then intent is to further reduce “medium risk” circuits to achieve all circuits in low risk range.

Date	System Risk (Per Fire Safety Model)
12/31/2019	115,969
12/31/2020	110,745
12/31/2021	90,386
6/30/2022	88176
12/31/2022*	83,156
12/31/2024*	37,571
12/31/2032*	1,170

*Projected risk score based on planned initiatives.

Enhanced Vegetation Management (EVM)

Year	Vegetation Contact on Lines
2019-2021	5.3
2001-2018	13.5

- Program invokes higher clearance standards.
- Implemented EVM program in spring of 2018 and fully achieved enhanced clearances at end of 2020.
  - Clearances do not prevent “blow-ins” or tall trees outside the right-of-way falling into the lines.
- Vegetation density along overhead power lines has been reduced (as measured by LiDAR):
  - 2020: 25.44%
  - 2021: 20.94%

Some Completed Initiatives

- **Enhanced Vegetation Management:** Fully implemented ongoing program that established clearances tailored to BVES's service area, which are beyond GO-95 minimum standards.
- **Fuse Upgrade Program:** Eliminated all expulsion (conventional) fuses from the system. 3,114 expulsion fuses were replaced by 2,578 current limiting fuses and 536 electronic fuses.
- **34.5 kV Supply Line Re-closers:** All have been changed out to Pulse Conditioned IntelliRupters.
- **Weather Stations:** Installed 20 weather stations throughout service area.
- **ALERTWildfire HD Cameras:** Have 15 cameras in ALERTWildfire network providing complete coverage of service area.
- **System Sectionalized:** PSPS high risk areas sectionalized from rest of BVES system.
- **3rd Party Ground Patrol:** Fully implemented ongoing program that established an annual 3rd Party Ground Patrol of the overhead system. (In addition to BVES's annual GO-165 ground patrol.)
- **LiDAR:** Fully implemented ongoing program that established an annual Light Detection and Ranging (LiDAR) survey of system to identify areas where additional vegetation clearing is necessary.
- **UAV Surveys:** Fully implemented ongoing program that established an annual aerial HD imaging and thermography inspections of system facilities.
- **Risk Assessment & Mapping:** Developed area and system specific risk modeling to include risk map that shows the overall ignition probability and estimated wildfire consequence along the electric lines and equipment. Also developed climate-driven risk map and modeling based on various relevant weather scenarios. Results were used to inform 2022 WMP and 2022 work plan.
- **Forester:** Placed a full time contracted utility forester in the BVES service area as part of the BVES Team. The job duties include: inspections, auditing, customer contacts and issue resolution, work plans development, specialized projects, contractor safety observations, and vegetation management program documentation and data analysis.


Expulsion Fuse

Electronic Fuse (S&C TripSaver II)


Current Limiting Fuse (ELF)

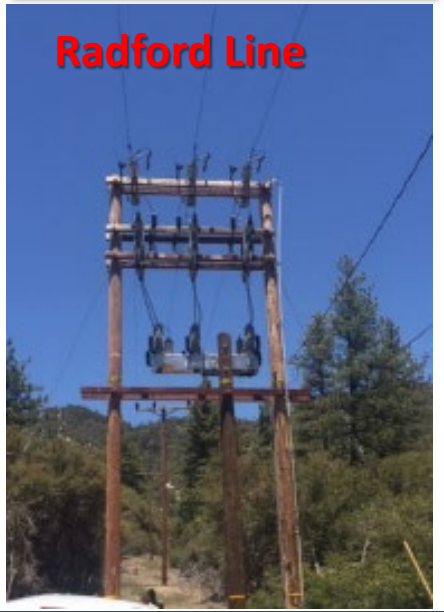

IntelliRupter

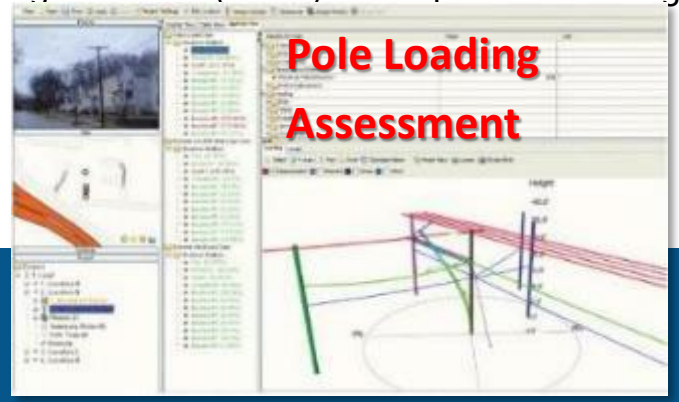

Deadman's Ridge

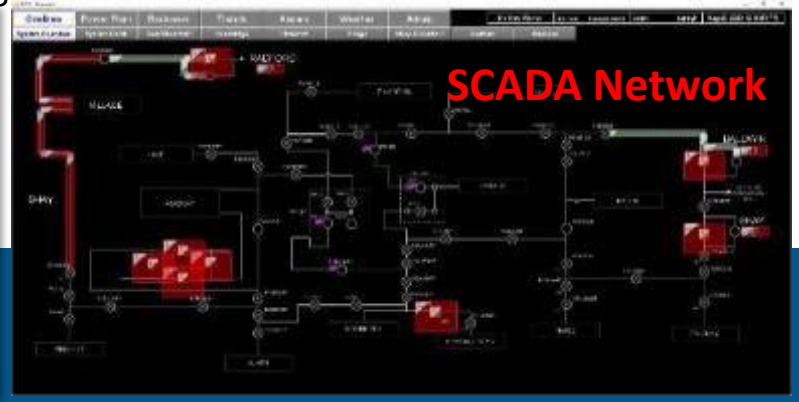

ALERTWildfire HD Camera

Some Initiatives In Progress

- **Covered Wire Project:** Replaces bare wire with covered wire (4.3 circuit miles on 34 kV & 8.6 circuit miles 4 kV systems per year). Over **30.2 circuit miles** installed to date.
- **Pole Loading Assessment & Remediation Program:** Proactively assesses poles and replaces/remediates deficient poles. To date **assessed 3,439 poles** and **replaced/remediated 1,238 poles**. Program to be merged with Covered Wire Project.
- **Evacuation Route Hardening:** Hardens T&D facilities along main evacuation routes to prevent facilities from blocking or impeding evacuation if subject to wildfire. **Hardened all primary routes (712 poles)**. Working on secondary routes that lead to primary routes.
- **Grid Automation Project:** Installs fiber network in service area, implements SCADA software and automates substations and field switches. Network completed.
  - **FLISR Project:** Installs 9 Fault Localization Isolation System Restoration devices on 34 kV system. **System is operational.**
  - **Substation Automation:** Automates and connects 3 substations per year to SCADA network.
  - **Fault Indicator Installation:** Installs and connects 129 FIs to SCADA network.
- **Radford Line Replacement Project:** Replaces 2.8 circuit miles of 34 kV line & 78 wood poles with covered wire & 71 fire resistant poles in HFTD Tier 3 area. **Project delayed to 2023.**
- **Tree Attachment Removal Program:** Removes approximately 1,207 tree attachments. **610 remaining in system.**
- **Real-time Wildfire Risk Modeling:** Working with Technosylva to implement wildfire forecasting applications to provide near real-time wildfire risk forecasts and conduct periodic asset risk analysis using historical weather climatology to support Wildfire Mitigation Plan (WMP) development and mitigation planning.







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2022 WMP Initiatives & Targets (CAPEX Projects)

Initiative	Target Units	Target Q1	Target Q1 + Q2	Actual Q1 + Q2	Target Q1 + Q2 + Q3	Target Q1 + Q2 + Q3 + Q4
Install Fault Indicators (FIs) Project	# of FIs	0	0	0	20	50
Covered Conductor Project	Circuit Miles	1.5	2.5	7.02	8.9	12.9
Radford Line Replacement Project	Circuit Miles	0	0	0	1	2.7
	# of Fire Resistant Poles Installed	0	0	0	22	70
Pole Loading Project	# of Poles Replaced	10	40	71	100	165
	# of Poles Assessed	25	75	104	150	225
Tree Attachment Removal Program	# of Tree Attachments Removed	0	0	2	30	80
Evacuation Route Hardening Project	# of Poles Hardened with Wire Mesh Wrap	350	412	412	412	412
Grid Automation Project	# of Substations Connected to SCADA Network	0	1	1	2	3

2022 WMP Initiatives & Targets (O&M Programs)

Initiative	Target Units	Target Q1	Target Q1 + Q2	Actual Q1 + Q2	Target Q1 + Q2 + Q3	Target Q1 + Q2 + Q3 + Q4
GO-165 Detailed Inspections	Circuit Miles	0	5	29.6	11	29
GO-165 Patrol Inspections	Circuit Miles	25	75	83.2	211	211
UAV Thermography Program	Circuit Miles	0	0	211	211	211
UAV HD Photographic/Video Inspection Program	Circuit Miles	0	0	211	211	211
Intrusive Pole Inspection Program	# of Poles Tested	0	0	587	850	850
LiDAR Inspection Program	Circuit Miles	0	0	211	211	211
Third Party Ground Patrol	Circuit Miles	0	0	211	211	211
GO-174 Substation Inspection Program	# of Substations Inspected	36	72	78	108	144
Vegetation Management Quality Control	# of Vegetation Management QCs	18	36	42	54	72
Achieving Line Clearances from Vegetation	Circuit Miles	18	36	61.6	54	72
Removal of Trees with Strike Potential on Lines	# of Trees Removed	22	44	67	66	88

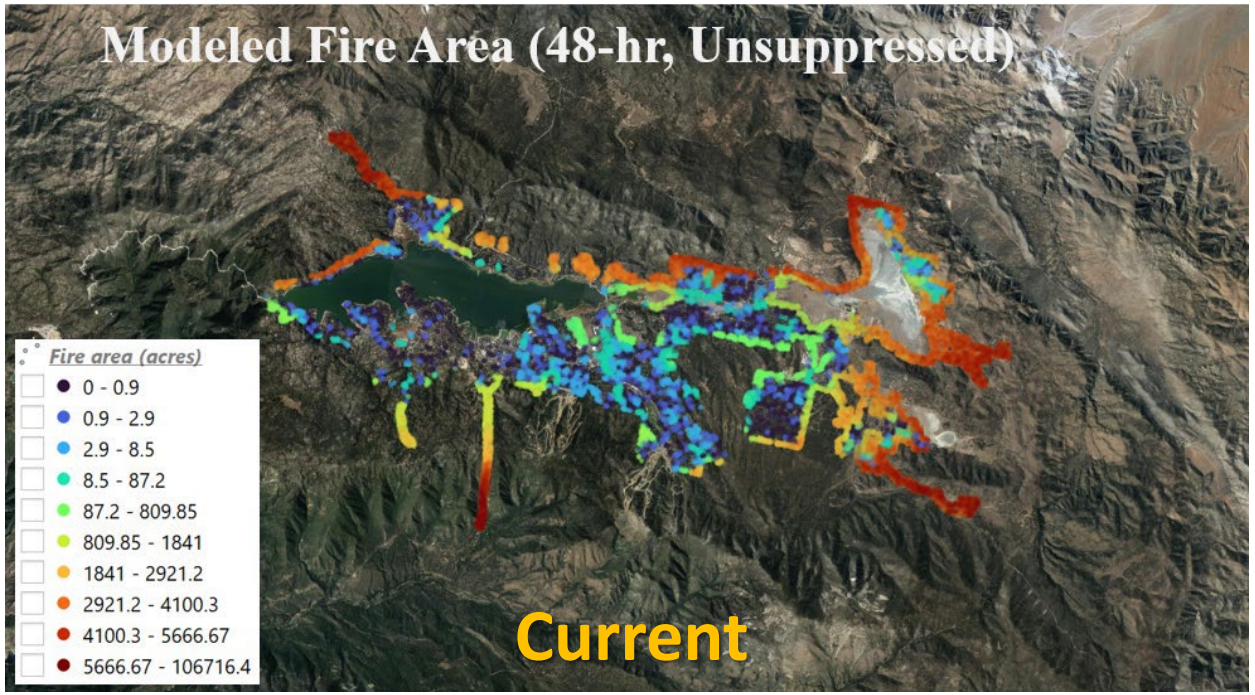
Primary Challenges to Improving Safety Performance

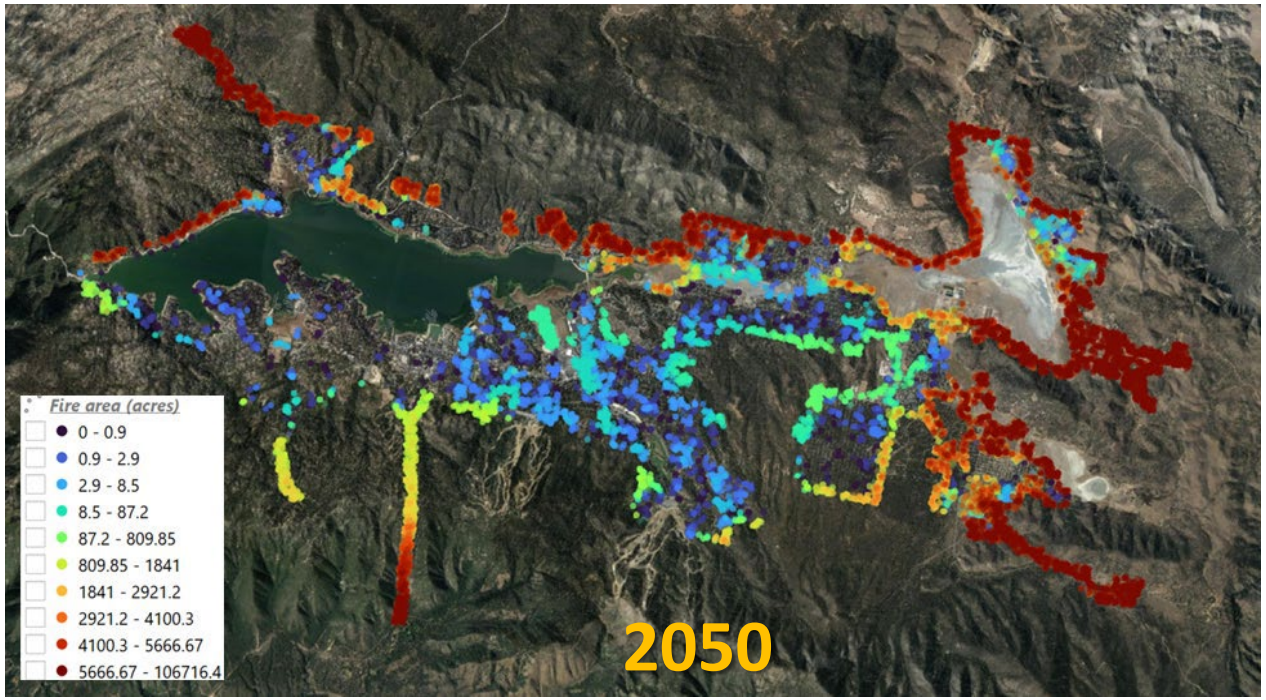
- Recruiting and retaining skilled staff.
- Contracting qualified power line construction contractors.
- Supply chain.
- Permitting.
- Staying ahead of climate change.
- Public understanding of mitigation costs.

Key Lessons Learned

- Advanced inspection techniques work.
  - LiDAR and UAV HD Photography & Thermograph.
  - GO-165 not sufficient; must go beyond.
  - Need to transition to Risk Based Inspection (RBI).
- Minimum GO-95 vegetation clearances not always adequate.
- Persistent and frequent public engagement essential.
- Steady focus on grid hardening.
- Work plan horizon is measured in years (supply chain, permitting, etc.).
- Network backbone essential to grid technology insertion.

Ignition Probability – Current & 2050





SCA Recommendation:

Embed leadership skills development into the "Engaged Management" 12-month objective to improve the Bear Valley Safety Culture

- President personally provided training and 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.
- EHS Consultant provided professional training to leadership on performing effective JHAs and monitoring employee and contractor safety performance. Other training areas covered:
  - Skills to enhance leadership's ability to effect positive safety improvements.
  - Importance of addressing safety planning and objectives at BVES's Weekly Management Meeting.
- Leadership engages in open dialog with employee representatives at monthly management-employee safety committee meetings.
- Each Supervisor conducts weekly meetings with his/her Team where they:
  - Emphasize the role each employee has in public safety.
  - Discuss the importance of listen to each other as well as other stakeholders in wildfire mitigation work.
  - Express their openness to receive suggestions on how to improve public safety.
  - Ensure employees know that reporting problems and/or their mistakes is critical to public safety.
  - Emphasize that work must only be done with the proper tools. If tools are not available or damaged, the work must stop and the situation must be resolved before starting work again. The President emphasized that if production is lost, so be it.
- Safety performance is the top line on all manager and supervisor appraisals. Performance metric goals have been set.
- EHS contractor tasked to check on the effectiveness of these effort with respect to employees perceptions of leadership toward safety – results are pending.

SCA Recommendation:

In collaboration with Bear Valley's vegetation management contractor, develop and implement an action plan to address safety culture issues, in particular regarding the flow of information about wildfire mitigation.

- The issue was discussed with the vegetation contractor's CEO, Operations Manager, and Safety Group by BVES President.
- BVES worked closely with its vegetation contractor Safety Group to address the issues identified and to ensure a specific plan was in place to improve information flow among contractor employees and between contractor employees and supervisors about wildfire hazards.
  - The plan included steps to increase compliance with procedures to control workplace and wildfire hazards. BVES and its vegetation contractor developed the plan jointly.
- 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).



Questions?

Our Values

In pursuing our mission, the board of directors, management and the company´s employees are guided by the shared Values presented below:

Integrity - Building trust through honest communications and doing what is right
Teamwork - Maximizing efficiency through collaboration and individual strengths
Respect - Valuing diversity and treating all stakeholders with fairness
Excellence in Service - Striving for excellence and quality in everything we do
Accountability - Taking ownership of one´s actions