Wildfire Mitigation Plan Update
R18-10-007 Workshop Phase 2

Bear Valley Electric Service
September 17, 2019
Key Discussion Points

• Where are we focused?

• What has been done so far?

• Working/not working?

• What Concerns/Problems/Delays have Arisen?
Where We Are Focused?

BVES WMP aims to eliminate system sparks.
## What Has Been Done So Far?

### Design and Construction

<table>
<thead>
<tr>
<th>Mitigation Measure</th>
<th>Description</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Pineknot Substation Upgrades</td>
<td>Technical and safety upgrades to prevent equipment exposure to the elements and human contact</td>
<td>In progress. 23% complete. ECD November 2019.</td>
</tr>
<tr>
<td>Ute Undergrounding</td>
<td>Asset transfer from SCE; line undergrounding to mitigate proximity to forested areas</td>
<td>Conducting preliminary planning &amp; discussions.</td>
</tr>
<tr>
<td>Fuse Upgrades</td>
<td>Conventional fuse replacements with current limiting fuses and electronic programmable (vacuum switch) TripSaver technology to limit potential sparking when faults occur WMP 2019-2020 Goal: Replace: 1,393 fuses</td>
<td>In progress. 9.9% complete.</td>
</tr>
<tr>
<td>Tree Attachment Removal Project</td>
<td>Removal of tree attachments to avoid proximity of fuel and ignition sources (5-year project to remove 1,207 tree attachments) WMP 2019-2020 Goal: Remove 242 tree attachments.</td>
<td>In progress. 22.2% complete.</td>
</tr>
<tr>
<td>Pole Loading Assessment &amp; Remediation Program</td>
<td>Increase rate of pole assessments to identify pole issues sooner, which can result in wildfires (5-year project to assess 8,737 poles) WMP 2019-2020 Goal: Assess 1,747 poles.</td>
<td>In progress. 26.6% complete.</td>
</tr>
<tr>
<td>Covered Conductor Replacement Pilot Program</td>
<td>Pilot to determine the effectiveness of using covered tree wire conductor to test feasibility of a larger rollout</td>
<td>Received material. Planning project. ECD November 2019.</td>
</tr>
<tr>
<td>Covered Conductor Wrap Pilot Program</td>
<td>Pilot of a wire wrap for high-risk wires to test feasibility of a larger rollout</td>
<td>As of this point, not considered.</td>
</tr>
</tbody>
</table>
34.5kV Radford line is in the HFTD Tier 3

BVES WMP 2019-2020
  - Convert Radford to covered conductors and hardened poles
    - Estimated cost $2,500,000
  - Bids averaged 2x estimate
  - Re-bid with design phase in 2019 and construction phase in 2020
  - Implemented operational measures to mitigate wildfire risk
# What Has Been Done So Far?

## Inspection and Maintenance

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<tr>
<td><strong>First Annual On-Ground Inspection (GO-165)</strong></td>
<td>One annual system patrol to inspect the condition of assets to avoid faults, which can result in fires</td>
<td>Completed.</td>
</tr>
<tr>
<td><strong>Second Annual On-Ground Inspection</strong></td>
<td>One more system patrol in addition to the annual GO-165 patrol to ensure all assets are in good condition to avoid faults, which can result in fires</td>
<td>Starting September 2019. ECD October 2019.</td>
</tr>
<tr>
<td><strong>Predictive-Based Maintenance</strong></td>
<td>System examination using infrared sensors and electromagnetic inference systems</td>
<td>Completed.</td>
</tr>
<tr>
<td><strong>Electrical Preventative Maintenance Program</strong></td>
<td>System examination using additional diagnostics on assets to further inspect the condition of assets</td>
<td>Starting September 2019. ECD November 2019.</td>
</tr>
<tr>
<td><strong>LIDAR Inspection</strong></td>
<td>Light Detection and Ranging (LIDAR) inspections of the overhead facilities in difficult-to-patrol areas to visualize vegetation growth proximity to the system for targeted maintenance</td>
<td>Starting September 2019. ECD November 2019.</td>
</tr>
<tr>
<td><strong>GIS Data Collection &amp; Sharing</strong></td>
<td>Geographic Information System (GIS) database on system infrastructure for asset management and planning with key stakeholders</td>
<td>In progress.</td>
</tr>
<tr>
<td><strong>Vegetation Management Plan</strong></td>
<td>Vegetation maintenance program to avoid system proximity, which may cause wildfires</td>
<td>In progress.</td>
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## What Has Been Done So Far?

### Operational Practices

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<tr>
<td>Operational Considerations / Special Work Procedures</td>
<td>Protocols and procedures for staff during high-risk fire conditions</td>
<td>Completed.</td>
</tr>
<tr>
<td>Automatic Recloser Upgrades</td>
<td>Recloser replacement to reduce electrical sparking, while also helping mitigate power outages and equipment damage</td>
<td>In progress. ECD November 2019.</td>
</tr>
<tr>
<td>Emergency Reporting</td>
<td>Protocols and procedures for staff when third-parties (e.g. customers) report potential fires, including &quot;arching, sparks, smoldering, smoke, or fire&quot;</td>
<td>Completed.</td>
</tr>
<tr>
<td>Wildfire Infrastructure Protection Teams</td>
<td>Roles and responsibilities for staff to respond to protect system infrastructure in case of emergencies</td>
<td>Completed.</td>
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# What Has Been Done So Far?

## Situational & Conditional Awareness

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<tr>
<td>Grid Automation</td>
<td>Grid automation (e.g. FLISR and SCADA) to improve system responses to prevent wildfires and enhance safety (4-year 4-phase project). WMP 2019-2020 Goal: Complete phase 1.</td>
<td>In progress. 22% complete.</td>
</tr>
<tr>
<td>GIS-Based Applications (e.g. Outage Management System)</td>
<td>Implementation of GIS-based systems, such as outage management systems and interactive voice response systems, which allow BVES to locate outages and respond to customers more promptly in the case of a wildfire or related emergency.</td>
<td>Completed.</td>
</tr>
<tr>
<td>Web-Based Weather Resources</td>
<td>Monitoring of publicly available weather resources to evaluate forecasted weather and monitor for potential extreme fire conditions to prepare the system during high-risk events</td>
<td>Completed.</td>
</tr>
<tr>
<td>BVES-Owned Weather Stations</td>
<td>Monitoring of BVES-specific weather stations in strategic locations to evaluate forecasted weather and monitor potential extreme fire conditions</td>
<td>50% complete. ECD November 2019.</td>
</tr>
<tr>
<td>Weather Forecasting</td>
<td>Analysis of weather feeds to predict and respond to extreme weather events, which may result in wildfires. BVES currently analyzes this in-house but proposes to contract out the services on a weekly basis for additional analysis</td>
<td>Completed.</td>
</tr>
<tr>
<td>Remote Monitoring</td>
<td>Monitoring of system and assets in remote areas using HD cameras to improve situational awareness and maintenance of key assets</td>
<td>Not started.</td>
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*Response & Recovery*

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<td>Public Safety Power Shut-Off (PSPS) Protocols</td>
<td>Protocols and procedures to respond to and recover from de-energization events, which proactively prevent wildfires</td>
<td>Completed.</td>
</tr>
<tr>
<td>Post Incident Recovery, Restoration &amp; Remediation</td>
<td>Protocols and procedures to respond to and recover from any wildfire or related emergency events</td>
<td>Completed.</td>
</tr>
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</table>
Exacter surveys useful
- Found problems that a regular GO-165 ground inspection would have missed

Vegetation management clearances above the minimum required
- 72” Clearance likely contributed to unprecedented zero tree-contact events
- General public & local government very supportive of trimming efforts

Wrap covered wire pilot project
- Sourcing and engineering evaluations failed
What Concerns/Problems/ Delays have Arisen?

• Lead time on current limiting fuses and FuseTripSavers is long due to high demand.

• Lead time on covered conductor is similarly long due to high demand.

• T&D constructions costs are higher than originally projected due to high construction demand in California.

• Difficult to find available contractors to conduct construction work.

• Many vendors pushing technologies not ready for prime time.
Questions?