PacifiCorp 2020 PSPS Performance

March 29, 2021
Joint Investor-Owned Utilities 2020 PSPS Workshop
PacifiCorp’s California Service Territory

PacifiCorp provides electricity to approximately 45,000 customers via 63 substations, 2,520 miles of distribution lines, and about 800 miles of transmission lines across nearly 11,000 square miles of which just under half is classified as HFTD.

HFTD Stats
- Approximately 1,200 miles or 36% of all overhead lines are located within the HFTD
- 850 miles of overhead distribution lines in the HFTD
- 350 miles of transmission lines in the HFTD
Public Safety Power Shutoff Overview

PacifiCorp’s plan for proactive de-energization is currently limited to Tier 3 areas. Breaking the two main areas into five PSPS Areas was done to minimize customer impact where appropriate, based on weather monitoring capability and circuit topology.

<table>
<thead>
<tr>
<th>PSPS Name</th>
<th>Substation</th>
<th># of Circuits</th>
<th>Customers</th>
<th>Distribution OH</th>
<th>Distribution UG</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Happy Camp</td>
<td>Seiad, Happy Camp</td>
<td>3</td>
<td>865</td>
<td>48.4</td>
<td>5.9</td>
</tr>
<tr>
<td>2 Weed</td>
<td>Weed, International Paper</td>
<td>5</td>
<td>2,589</td>
<td>90.5</td>
<td>62.1</td>
</tr>
<tr>
<td>3 Mt. Shasta</td>
<td>Mt. Shasta</td>
<td>6</td>
<td>5,074</td>
<td>86.4</td>
<td>76.7</td>
</tr>
<tr>
<td>4 Dunsmuir</td>
<td>N &amp; S Dunsmuir, Nutglade</td>
<td>5</td>
<td>1,806</td>
<td>30.0</td>
<td>8.6</td>
</tr>
<tr>
<td>5 Snowbrush</td>
<td>Snowbrush</td>
<td>1</td>
<td>17</td>
<td>4.2</td>
<td>1.2</td>
</tr>
<tr>
<td>Total</td>
<td>9 Substations</td>
<td>20</td>
<td>10,351</td>
<td>259.5</td>
<td>154.5</td>
</tr>
</tbody>
</table>

**PSPS – Watch Event**
- KBDI Mainly: KBDI >= 622
- KBDI & VPD: KBDI >= 575 & Localized VPD > 94th
- VPD Mainly: Localized VPD >= 97th & KBDI >= 480
- FFWI6 >= 30 and Wind gusts >=25 mph OR Sustained wind >=16

**PSPS – EOC Activation**
- KBDI & VPD: KBDI >= 650 & Localized VPD > 94th
- FFWI6 >= 30 and Wind gusts >= 31 mph
PSPS is Used as a Measure of Last Resort

Protocols ensure PSPS is a measure of last resort to minimize frequency and impact

- Customers notified based on forecasts
- De-energized on real time conditions
- Circuit segmentation created for Tier 3 circuits
- Pre-event review of current system conditions and vegetation work plans

Additional pre-event actions include:
- Engagement of critical customers
- Engagement with local emergency responders

### September 13 Event

- Duration 7 hours & 49 minutes (10:01 a.m. until 17:50 p.m.)
- Field inspections and patrols instituted in the affected area, recording wind observations, submitting weather observations, videos, and pictures of the current conditions
- Final inspection of the de-energized circuits performed in sections prior to re-energization
- The company did not identify any equipment that was damaged during the September 13 event
- Event affected two distribution circuits (5G83, 5G45)

### PSPS Status Table

<table>
<thead>
<tr>
<th>Date</th>
<th>Location</th>
<th>Total Customers Notified</th>
<th>Total Customers De-energized</th>
<th>Medical Customer De-energized</th>
<th>Counties De-energized</th>
<th>Total Tribes De-energized</th>
</tr>
</thead>
<tbody>
<tr>
<td>9/13/2020</td>
<td>Weed</td>
<td>2,559</td>
<td>2,559</td>
<td>6</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>9/17/2020</td>
<td>Weed</td>
<td>Original – 2,500 Revised - 600</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>10/25/2020</td>
<td>Happy Camp</td>
<td>848</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

* 9/17 & 10/25 – Watch Events no de-energization
Circuit 5G83

- Total Customers – 1,976
- Residential – 1,693
- Commercial/Industrial – 263
- Medically Sensitive – 3
- Other - 17

Circuit 5G45

- Total Customers – 581
- Residential – 444
- Commercial/Industrial – 135
- Medically Sensitive – 2
- Other - 0
2020 Lessons Learned

• PacifiCorp is continuing to improve its notification and documentation of events to increase communication between various departments involved in PSPS events

• Access to GIS data through shape files will be made available during notifications to public safety partners and provide such files upon request

• Improving company website to include weather forecast data to improve transparency on a PSPS potential event
Public Safety Power Shutoff Improvements

PacifiCorp is committed to further improve its predicative weather and PSPS forecasting capability

**2019**
- Initial capability
  - Identification and siting of initial weather stations
  - Development of initial fire indices
  - High level risk and fire modeling complete

**2020**
- Improved forecasting
  - Expansion of weather station network to 21 locations
  - Leveraged outside meteorology expertise
  - Improved risk modeling began leveraging data science to formulate conclusions

**2021**
- Material advancement in predicative weather capability
  - Chief Meteorologist hired February 2021 with extensive utility experience in establishing predicative weather capability focused on wildfire mitigation and PSPS
  - Additional in-house meteorologist before fire season
  - Initial scoping complete and estimates received for high performance computing cluster
  - In house and fully operational Weather Research & Forecast (WRF) model before fire season

**2022**
- Continuous improvement
  - Operational high performance computing cluster for implementation of Machine Learning and impacts-based forecast.
  - Continued refinement of fire potential indices
  - Improved weather forecasting at station, district and zone of protection level
  - Continued strategic growth of Mesonet program
Stakeholder Engagement and further improvements in Emergency Management

- Continued improvement in stakeholder coordination
- Emergency Management Director hired March 2021
- Responsible for overall strategy to improve training, communication and response to PSPS event coordination
- Further expansion of Emergency Management Team in 2021 to provide additional community outreach and 24/7 monitoring
- Identify communities beyond Tier 2 and Tier 3 for wildfire preparedness workshops
Customer Impact Reduction & Community Resiliency Programs

Pacific Power’s Community Resiliency Program includes a portfolio of resources for communities seeking to enhance their emergency management and disaster preparedness capabilities. These resources include:

- **Technical assessments** to evaluate the potential costs and benefits of adding energy storage and associated technologies to critical facilities
  - Applications are currently being accepted.
  - Assessments are initiated on a first come, first served basis
- **Grants** are available for the purchase of portable renewable backup generators and the installation of energy storage at critical facilities
  - Grant requests will be accepted July - November 2021
  - Approximately $400,000 of available funding in 2021
  - Funding requests are competitively evaluated
  - Working with local emergency managers throughout our service territory to identify potential projects.

### Table: Customer Impact Reduction & Community Resiliency Programs

<table>
<thead>
<tr>
<th>Zone</th>
<th>Low Income</th>
<th>Life Support</th>
<th>Medical</th>
<th>AFN*</th>
<th>Medical Baseline</th>
</tr>
</thead>
<tbody>
<tr>
<td>NON-PDZ</td>
<td>9,546</td>
<td>30</td>
<td>30</td>
<td>71</td>
<td>77</td>
</tr>
<tr>
<td>PDZ</td>
<td>2,671</td>
<td>2</td>
<td>1</td>
<td>23</td>
<td>16</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>12,217</strong></td>
<td><strong>32</strong></td>
<td><strong>31</strong></td>
<td><strong>94</strong></td>
<td><strong>93</strong></td>
</tr>
</tbody>
</table>

*AFN include customers self certified as needing additional notification. All Life Support, Medical, and Medical Baseline Customers are contacted individually prior to a PSPS.

### Statistics

- **All customers in CA PDZ**: 10,289
- **Critical Customers in CA PDZs**: 210

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# Continued WMP Focus

<table>
<thead>
<tr>
<th>Customer preparedness</th>
<th>Situational Awareness</th>
<th>Asset Inspections</th>
<th>Grid Hardening</th>
</tr>
</thead>
<tbody>
<tr>
<td>✓ Customer Communication regarding wildfire mitigation and preparedness education</td>
<td>✓ Mesonet network expansion</td>
<td>✓ Complete Tier 2/3 Inspections prior to Fire Season</td>
<td>✓ Installation of covered conductor</td>
</tr>
<tr>
<td>✓ Website customer engagement tools; such as PSPS map and weather forecast summary</td>
<td>✓ Total Program Target: 46 weather stations</td>
<td>✓ Identify fire threat conditions and accelerate correction</td>
<td>• Total Program Target: 221 line-miles</td>
</tr>
<tr>
<td>✓ Updating of customer contact preference information</td>
<td>✓ Further improve risk assessment and mapping</td>
<td>✓ Refreshed focus on QA/QC of Inspections:</td>
<td>• 2021 Program Target: 85.2 line-miles</td>
</tr>
<tr>
<td>✓ Communication on process of self-identifying as an AFN customer</td>
<td>✓ Improved in house weather modeling</td>
<td>• Incorporate fire risk identification into annual inspector training</td>
<td>✓ Replacement or reinforcement of wood poles</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Prioritization of higher risk (Tier 2/3) locations first</td>
<td>• Total Program Target: 4,326 poles</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Complete desktop review on 50% of planned detail/intrusive inspections (~6,500)</td>
<td>• 2021 Program Target: 128 poles</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Field audit at least 5% (680) of planned detailed inspections</td>
<td>✓ Installation of System Automation Equipment</td>
</tr>
<tr>
<td></td>
<td></td>
<td>✓ Infrared Inspections Planned on Approximately 700 line-miles of overhead transmission in 2021</td>
<td>• 2021 Target – 27 devices</td>
</tr>
<tr>
<td></td>
<td></td>
<td>✓ Continuation of vegetation inspection pilot program</td>
<td>• Program Target – 68 devices</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>✓ Replacement of small diameter conductor beginning in 2022</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Total Program Targets: 53 line-miles (begins in 2022)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• 2021 Program Target: 0 line-miles (begins in 2022)</td>
</tr>
</tbody>
</table>
Thank you