PacifiCorp 2020 Wildfire Mitigation and Public Safety Power Shutoff (PSPS) Preparation

May 2020
Overview

- PacifiCorp’s California Service Territory
- 2020 Fire Season Outlook and Preparation
- Public Safety Power Shutoff Overview
- PacifiCorp’s Proactive De-energization Approach
- PSPS Walkthrough
- Proactive De-Energization: PDZ Event Criteria
- Public Safety Power Shutoff Vision
- PSPS Communications and Outreach and Coordination
- PSPS During a Pandemic
PacifiCorp provides electricity to approximately **45,000 customers** via **63 substations** and **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.
2020 Fire Season Outlook

• Generally fire season spans for PacifiCorp from Memorial Day through late September, while PSPS risk periods tend to occur starting in August, depending on how severe long term drying has been.

• Fire season across the Western United States increased by nearly six weeks over a 20 year span (1992 – 2012).

• Mega Fires (more than 100,000 acres) increased threefold in the last 10 years.

• Areas within our service territory are some of the most wildfire prone states in the United States and has experienced an upward trend of wildfire size over the past 50 years.

• Areas of greatest potential loss from wildfire are located in the Wildland Urban Interface (WUI) that continues to expand with California’s growing population.

• Trends in acres burned by wildfire are projected to increase in California as temperatures warm and incidence of drought increases.

• 2020-long term fire forecast predicts an above normal significant fire potential this fire season for Northern California
Preparation for Fire Season

• Situational Awareness
  o Calibrated weather station
  o Daily forecasting resumed on May 15, 2020
• Operational Practices
  o Wildfire refresher training conducted with field employees
  o “No test-energize” policy in place on red flag warning days
• System Hardening
  o Inspections
  o Vegetation management, including pre-season inspections of off cycle circuits
  o First round of relay/recloser upgrades are nearing completion
  o Beginning first reconductoring project in mid-summer (expected to be commissioned just prior to PSPS-risk period)
• PSPS Threshold Refinements
  o Incorporates more granular local information to advise actions
• Customer-facing tool development
  o The company’s customer-facing PSPS website,¹ customer and public safety partner communications²

² https://www.pacificpower.net/outages-safety/wildfire-safety.html
PacifiCorp’s plan for proactive de-energization is currently limited to Tier 3 areas, which are the extreme risk areas.

<table>
<thead>
<tr>
<th>PDZ Name</th>
<th>Circuits</th>
<th>Customers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Happy Camp</td>
<td>3</td>
<td>865</td>
</tr>
<tr>
<td>Weed</td>
<td>5</td>
<td>2,589</td>
</tr>
<tr>
<td>Mt. Shasta</td>
<td>6</td>
<td>5,074</td>
</tr>
<tr>
<td>Dunsmuir</td>
<td>5</td>
<td>1,806</td>
</tr>
<tr>
<td>Snowbrush</td>
<td>1</td>
<td>17</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>20</strong></td>
<td><strong>10,351</strong></td>
</tr>
</tbody>
</table>
PacifiCorp’s Proactive De-energization Approach

• PacifiCorp developed an operating procedure that documents the process for a proactive de-energization event.

1. PacifiCorp utilizes automated weather systems monitoring to generate an internal notification based on the watch criteria, and a potential PSPS activation is triggered.

2. When a potential activation is triggered a Public Safety Power Shutoff Event Proposal is prepared and provided to the Vice President of System Operations and the Vice President of T&D Operations which contains the timing details, area, and forecasted duration of the event.

3. The Vice President of System Operations and the Vice President of T&D Operations evaluate all relevant information as described in the company’s 2020 WMP, including input from public safety partners to properly characterize and consider impacts to local communities.

4. The Vice President of System Operations and the Vice President of T&D Operations decide whether to implement a PSPS event.

5. If activated, the company’s notification and activation protocols are followed, including activation of the company’s emergency management system and customer/public notifications.
   • Customer Service for customer notification (48 hours notice is desired)
   • Emergency Management for local emergency services notification
   • Regulation for notification to the director of the CPUC safety and enforcement division (SED).
   • Local Operations for required switching / line patrolling
   • Regional Business Manager for preparation of customer care centers and large customer contact

6. Conditions are continuously monitored during the PSPS event and when elevated risk conditions no longer exist, lines are patrolled for damage, and re-energized, ending the PSPS event.

As experience with proactive de-energization is gained, the company expects to evolve the plan incorporating lessons learned to improve the process.
Public Safety Power Shutoff Walkthrough

Public Safety Power Shutoff (PSPS) during Extreme Risk Days where thresholds for wind and low precipitation have been exceeded.

During Extreme Risk Days, in identified areas, deploy additional resources to area for assessment/monitoring at a local level.

Utilization of protection and control settings during Red Flag Warning Days, which require additional field patrols before re-energizing lines after a fault event.

Implementation of weather monitoring and weather forecasting in localized areas, including installation of weather monitoring stations.

Additional Criteria

- **Environmental**
  - Recent precipitation
  - Wind directionality
  - Recent fire activity throughout service territory

- **Locational**
  - Alternative ways to re-route power to affected areas
  - Impacts on mandatory or voluntary evacuation orders in place ( ingress / egress routes)

- **Situational**
  - Real-time situational awareness information from personnel positioned in the impacted areas identified as potentially at risk
  - Current fire activity throughout service territory
  - Input from local emergency services and response authorities

While mainly elevated through environmental conditions (Precipitation and wind); the decision to implement PSPS considers additional criteria.
Proactive De-Energization: PDZ Event Criteria

- PacifiCorp uses the following measurements as inputs to the PSPS watch criteria:
  - Hourly Fosberg Fire Weather Index (FFWI) which uses temperature, relative humidity, 10-minute wind-speed factored into a single weather index which is correlated to influence on fire spread, accumulated over a 6 hour period (FFWI6).
  - The Keetch-Byram Drought Index (KBDI) which assesses the risk of fire by representing the net effect of evapotranspiration and precipitation in producing cumulative moisture deficiency.
  - Forecasted wind speeds and potential sustained gusts.

- An automatic notification is triggered internally for specific PSPS areas based on a forecast of the above measurements meeting the following levels:

<table>
<thead>
<tr>
<th>PSPS Watch Level 1</th>
<th>PSPS Watch Level 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>• KBDI &gt;=622 and</td>
<td>• KBDI &gt;=622 and</td>
</tr>
<tr>
<td>• FFWI6 &gt;=30 and</td>
<td>• FFWI6 &gt;=30 and</td>
</tr>
<tr>
<td>• Sustained wind &gt;=16 mph or Wind gust &gt;=25 mph</td>
<td>• Wind gust &gt;31 mph</td>
</tr>
</tbody>
</table>

- Localized criteria such as up to date or real time weather and community information are incorporated when a determination is made to implement an actual PSPS event as described in the company’s 2020 WMP.

- Coordination and dynamic planning with public sector entities, other private companies and the company informs the decision-making process.

- PacifiCorp is also evaluating how to layer more localized weather and vegetation data into its PSPS assessment process.
Public Safety Power Shutoff Long-Term Vision

PacifiCorp has substantial work it plans to deliver to limit the impacts, both short- and long-term, for mitigating the impacts of PSPS

- PacifiCorp has a significant amount of system hardening underway which will limit the need for customers to experience PSPS events in the future.
- Long term, the company is working to remove as many customers as is reasonable from PSPS operations.
- Slide 10 shows an example area in which the hardened system would benefit about 1,800 customers served.
- These plans have been developed for all areas that are currently part of the company’s PSPS plans.
- As work is delivered and systems are hardened, these plans, equipment and customer lists are updated.
Impacts of Asset Hardening on PSPS-affected Customers

Example of Asset Hardening and Impact on PSPS Minimization

<table>
<thead>
<tr>
<th>PDZ</th>
<th>Ref #</th>
<th>Construction Activity</th>
<th>Priority/Planned Completion Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dunsmuir</td>
<td>1</td>
<td>Install Weather Station will provide greater detail of weather conditions in and around the greater Dunsmuir area.</td>
<td>2019</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>Rebuild 1.4 miles to covered conductor, re-conductoring the single phase portion of circuit 5G69 up the hill to a radio tower. There are no taps on this line.</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>Rebuild 7.6 miles to covered conductor, re-conductoring and converting the two phase portion of 5G69 between 5G79 and Dunsmuir Substation to three phase. This is a transmission underbuild project and overhead taps are also to be re-conductored.</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>Rebuild 3.9 miles to covered conductor, re-conductoring the remainder of 5G69 overhead portions serving the Shasta Retreat area out of North Dunsmuir Substation.</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>Rebuild 6.0 miles to covered conductor, re-conductoring the overhead portions of circuits 7G71 and 7G73 out of North Dunsmuir Substation. The two circuits will be constructed at 15kV but remain energized at 4.16kV.</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>6</td>
<td>Rebuild 3.5 miles to covered conductor, re-conductoring the entirety of the overhead portions of circuits 7G75 out of South Dunsmuir Substation. This circuit will be constructed at 15kV but remain energized at 4.16kV.</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>7</td>
<td>Rebuild 8.4 miles to covered conductor, re-conductoring the overhead portions of 8G95 out of Nutglade Substation, however timing and necessity are expected to be informed by continuing analysis of fire and weather risks.</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>8</td>
<td>Replace recloser using SEL 651 capable of remote reconfiguration (communications required). Configured with fire settings (which allow for four setting profiles, in addition to high impedance fault detection capabilities) and will be remotely communicable.</td>
<td>2020</td>
</tr>
<tr>
<td></td>
<td>9</td>
<td>Substation Relay Replacement at North Dunsmuir Substation (5G69, 7G71, 7G73). Replace Relays with SEL 751s &amp; DFA (distribution fault anticipation technology).</td>
<td>2020</td>
</tr>
<tr>
<td></td>
<td>10</td>
<td>Substation Breaker and Relay Replacement at South Dunsmuir Substation (7G75). Replace Relays with SEL 751s &amp; DFA (distribution fault anticipation technology).</td>
<td>2020</td>
</tr>
<tr>
<td></td>
<td>11</td>
<td>Substation Breaker and Relay Replacement at Nutglade Substation (8G95). Replace Relays with SEL 751s &amp; DFA (distribution fault anticipation technology).</td>
<td>2020</td>
</tr>
</tbody>
</table>

Dunsmuir area PDZ
After completion of all steps, reduces impact to approximately 1,800 customers.

As work is completed, a large number of customers will not be likely to be involved in PSPS.
Situational Awareness to Inform PSPS Actions

A potent Canadian trough will dive south into the Great Basin tonight as high pressure strengthens off the Pacific NW Coast. This will tighten the NE-SW pressure gradient again and potentially produce winds that should be similar to Sunday's winds, if not slightly stronger. Nailing down the exact timing for Weed is proving difficult as computer models vary slightly, regarding when winds should back off. If winds back and turn more easterly, winds could die down quickly Tuesday evening.

Daily Forecast

**Location:** Weed
**Today's Date:** 10/28/2019
**Valid For:** 10/29/2019

**1-hour Avg Max Max**
Max Winds Wind Speed Gust Time Day...
Customer Communication Efforts

- Advertising
  - Print
  - Radio
  - Digital
  - Social
- Media outreach
- Bill insert
- Bill message
- Webinar
- Informational sheets
- Resource center on website

Customer Communication
Wildfire Mitigation and Safety
Customer Communication Tools

Interactive PSPS map

7-day PSPS forecasting table

Wildfire safety resource center and PSPS tools available at:
www.pacificpower.net/wildfiresafety
# PSPS Coordination

## Plan Development Coordination
- **Public Sector**
  - Emergency Management agencies were consulted and coordinated on final plans
- **Critical Facilities**
  - Master critical facility list was created
  - Facilities will be considered regarding criticality and need on a dynamic basis for any event

## Exercise and Evaluation
- **Table top exercise**
  - Scheduled for June 3 in Weed, CA
  - Venue TBD
  - Zoom option will be available

## Plan Development Coordination
- **Public Sector**
  - Emergency Management agencies were consulted and coordinated on final plans
- **Critical Facilities**
  - Master critical facility list was created
  - Facilities will be considered regarding criticality and need on a dynamic basis for any event
- **Evacuation and Egress Routes**
  - No PSPS affected communities within the company’s service territory have been identified as having only one route in or out
PSPS Outreach

Databases & Access and Functional Needs (AFN) Customers, Critical Infrastructure and Master Metered Customers

- PacifiCorp utilizes a customer service system (CSS) to identify medical baseline customers (rate schedule), self-identified vulnerable customers and customers with Standard Industrial Classification (SIC) codes that identify them as critical infrastructure.

- PacifiCorp created a code in the CSS to flag customers who would benefit from receiving extra notifications (access and functional needs).

- CSS is the system of record. Data from the enterprise data warehouse (EDW) can have up to a two-day delay. The data is kept current and lists are refreshed every time they are extracted.

- PacifiCorp partners with community based organizations (CBOs) to encourage customers to contact the company to self-identify and maintain accurate and current contact information. Customers can self-identify as vulnerable, including medical baseline customers, customers with life support equipment, and so forth.

- Letters will be sent to master metered customers requesting their assistance in identifying tenants that may also have special needs and would require additional notification before, during, and after a wildfire event.
PSPS Outreach

*Database Interaction*

- Operational tools that support PSPS and emergency planning functions consume data from CSS, where impacts are then able to be quantified and evaluated.
- The CSS data can be fed into the call software allowing the company to perform necessary outbound calls.
## PSPS Outreach

### Customer Count by Coding

<table>
<thead>
<tr>
<th>CLASS</th>
<th>LOW INCOME (On CARE Rate)</th>
<th>LIF (Life Support)</th>
<th>MED (Medical Condition)</th>
<th>PS (Customers who identify as needing more notification (i.e. pregnancy))</th>
<th>CRITICAL (Critical Infrastructure)</th>
<th>PDZ (Customers located in a PDZ)</th>
<th>BASELINE (Rate Schedule)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-PDZ</td>
<td>8,923</td>
<td>41</td>
<td>42</td>
<td>105</td>
<td></td>
<td></td>
<td>88</td>
</tr>
<tr>
<td>PDZ</td>
<td>2,480</td>
<td>4</td>
<td>5</td>
<td>35</td>
<td>202</td>
<td>11,029</td>
<td>31</td>
</tr>
<tr>
<td>TOTAL</td>
<td>11,403</td>
<td>45</td>
<td>47</td>
<td>140</td>
<td>202</td>
<td>11,029</td>
<td>119</td>
</tr>
</tbody>
</table>
PSPS During a Pandemic

Response Coordination – Public Sector, Mutual Assistance and Community Resource Centers

- Public Sector
  - Coordination with public sector agencies such as county emergency management will occur as early as feasible as forecasting confidence becomes higher
  - 72 hour advance notice to Emergency Management Agencies is the goal
  - Current pandemic practices will be coordinated immediately upon identification of potential event

- Mutual Assistance
  - The company belongs to multiple Mutual Assistance Groups which it can leverage to mitigate any unforeseen shortfalls of either parts, equipment or manpower
  - Mutual Assistance Groups have created procedures for support during pandemic response

- Community Resource Centers
  - CRCs have developed plans to continue to support the community as needed while maintaining appropriate actions in accordance with state and county guidelines during a pandemic