PG&E Transmission PSPS Informational Webinar
Following the wildfires in 2017 and 2018, some of the changes included in this presentation are contemplated as additional precautionary measures intended to further reduce future wildfire risk.

Agenda

- Safety
- Overview of PG&E’s Community Wildfire Safety Program
- PSPS event criteria - transmission
- PSPS pre-event notifications for impacted transmission customers
- PG&E’s GCC role during PSPS events
- Power restoration process
- Q&A
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**Community Wildfire Safety Program**

**REAL-TIME MONITORING AND INTELLIGENCE**
- Coordinating prevention and response efforts by monitoring wildfire risks in real time from our Wildfire Safety Operations Center
- Expanding our network of PG&E weather stations to enhance weather forecasting and modeling
- Supporting the installation of new high-definition cameras in high fire-threat areas

**NEW AND ENHANCED SAFETY MEASURES**
- Further enhancing vegetation management efforts to increase focus on vegetation that poses a higher potential for wildfire risk
- Conducting accelerated safety inspections of electric infrastructure in high fire-threat areas
- Disabling automatic reclosing of circuit breakers and reclosers in high fire-risk areas during wildfire season
- Proactively turning off electric power for safety (Public Safety Power Shutoff) when gusty winds and dry conditions combine with a heightened fire risk

**SYSTEM HARDENING AND RESILIENCY**
- Installing stronger and more resilient poles and covered power lines, along with targeted undergrounding
- Upgrading and replacing electric equipment and infrastructure to further reduce wildfire risks
- Working with communities to develop new resilience zones to provide electricity to central community resources during a Public Safety Power Shutoff event
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**Real-Time Monitoring and Intelligence**

**MONITORING** wildfire risks in real time from our **24/7** Wildfire Safety Operations Center and coordinating prevention and response efforts.

**INSTALLING**

~1,300 new weather stations by 2022

Data available at mesowest.utah.edu

**SUPPORTING** the installation of

~600 high-definition cameras by 2022

Images available at alertwildfire.org
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Wildfire Safety Inspections

As part of our enhanced wildfire safety efforts, implemented following the 2017 and 2018 wildfires as additional precautionary measures intended to further reduce wildfire risks, we conducted accelerated safety inspections of electric infrastructure in areas of higher wildfire risk (Tier 2 and Tier 3).

- We conducted comprehensive inspections of electric towers and poles through visual and aerial inspections.
- This work was done as part of our Community Wildfire Safety Program, and is in addition to our routine inspections and maintenance programs.
- We inspected substations and transmission and distribution lines in high fire-threat areas.
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**Inspections Overview**

- **Accelerated inspections of transmission and distribution** poles and towers as well as **substations** in high fire-threat areas
- **Visual inspections** (ground and/or climbing) performed by crews of up to four people
- **Aerial inspections by drones** to complement and further enhance inspections
- **Helicopters** for inspections and to deliver crews to remote locations

*We are taking action right away to address any immediate risk to public safety found during the accelerated inspections*
Electric System Maintenance and Repairs

We will evaluate inspection results to determine repair needs and associated timing. If any issues are found during the accelerated inspections that pose an immediate risk to public safety, we are taking action right away to address the issue.

- When inspections determine that repairs are needed, but there is not an immediate safety risk, we will follow our preventative maintenance procedures, consistent with state guidelines for high fire-threat areas.

- Repairs will depend on what we observe in the field but could range from installing new signs or electrical components to replacing poles or towers.

- Where possible, we will bundle work to minimize customer impact, particularly if we need to de-energize the line to safely complete the repairs.

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As the threat of wildfires continues to grow, it is overwhelmingly clear that more must be done to further reduce wildfire risks and help keep our customers and the communities we serve safe.

• Beginning with the 2019 wildfire season, we are expanding our Public Safety Power Shutoff program to include all electric lines that pass through high fire-threat areas – both distribution and transmission.

• This is not a decision PG&E takes lightly. Our customers rely on energy, especially those with energy needs for medical conditions.

• That is why we continue to analyze and revise our decision-making criteria.
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How PG&E’s Models Guide Operational Decisions

- The Utility Fire Potential Index and Outage Producing Winds Model are evaluated multiple times a day by PG&E’s meteorology and fire science team.

- Utility Fire Potential Index designations are rated from R1 (lowest) to R5 (highest), and drive a wide range of operational decisions (e.g., the type of work PG&E conducts, what equipment crews carry).

- When the Utility Fire Potential Index reaches R5, the Outage Producing Winds model is considered when determining if the rating should be escalated to R5-Plus.

- R5-Plus is the level where a PSPS could be called.

- Note that in some cases a PSPS could be initiated at a R4 designation if severe winds are present.

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The **Utility Fire Potential Index** and **Outage Producing Winds** models led to the creation of the following PSPS criteria, that are typically observed when the rating reaches R5-Plus. **Note that no single factor drives a Public Safety Power Shutoff.**

<table>
<thead>
<tr>
<th>A RED FLAG WARNING</th>
<th>LOW HUMIDITY LEVELS</th>
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<tr>
<td>declared by the National Weather Service</td>
<td>generally 20% and below</td>
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| FORECASTED SUSTAINED WINDS GENERALLY ABOVE 25 MPH AND WIND GUSTS IN EXCESS OF APPROXIMATELY 45 MPH, depending on location and site-specific conditions such as temperature, terrain and local climate |

<table>
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<tr>
<th>CONDITION OF DRY FUEL</th>
<th>ON-THE-GROUND, REAL-TIME OBSERVATIONS</th>
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<tr>
<td>on the ground and live vegetation (moisture content)</td>
<td>from PG&amp;E’s Wildfire Safety Operations Center and field observations from PG&amp;E crews</td>
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PG&E is launching a dedicated webpage with weather forecasting information and a daily 7-day lookahead. The site will show when and where PG&E is forecasting the type of conditions that may lead to a PSPS event.

### Not Expected
Conditions that generally warrant a PSPS event are not expected at this time.

### Elevated
An upcoming event is being monitored for an increased potential of a PSPS event.

### PSPS Watch
PG&E’s Emergency Operations Center (EOC) is activated for a reasonable chance of executing PSPS due to a combination of adverse weather and dry fuel conditions. This level is typically issued within 72 hours before the anticipated start of an event.

### PSPS Warning
PG&E’s EOC is activated and customers in areas being considered for PSPS have been or are being notified. PSPS is probable given the latest forecast of weather and fuels and/or observed conditions. PSPS is typically executed in smaller and more targeted areas than the PG&E Geographic Zones. This level does not guarantee a PSPS execution as conditions and forecasts may change.
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PSPS Criteria – Transmission

- As part of our wildfire risk monitoring, we will review any transmission lines in the potentially impacted area (i.e. R5-Plus rating).

- While no single factor will drive a Public Safety Power Shutoff, some factors for a transmission-level impact include:
  - Severity and duration of weather
  - Site-specific environmental conditions that increase wear
  - Age and condition of the asset
  - Status of recent repairs
  - Real-time field observations

- If it is determined that a transmission line might be de-energized for safety, **PG&E works closely with the California Independent System Operator (CAISO) to assess the system impacts.**
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**NOTIFICATIONS OVERVIEW:**

1. **INITIAL OUTREACH** | PG&E’s Emergency Operations Center (EOC) notifies transmission customers/entities included in the initial scope

2. **FINAL SCOPE** | PG&E’s EOC notifies transmission customers/entities after PG&E Grid Control Center (GCC) completes the operational studies in conjunction with CAISO

3. **JUST BEFORE POWER IS TURNED OFF** | GCC operators notify functional equivalents at impacted transmission customers/entities

4. **PUBLIC SAFETY POWER SHUTOFF**

   - **ONCE POWER IS RESTORED** | GCC operators notify impacted transmission customers/entities

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**Note:** The cadence and frequency of notifications will depend on the forecasted weather conditions and how quickly those threats change, among other factors.

PG&E encourages transmission customers to connect with local city leadership (City Manager, Public Works director, etc.) regarding outreach related to Public Safety Power Shutoff and additional communications during an event.
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**PSPS Notifications**

- PG&E will **notify transmission customers and entities via phone calls**
- To ensure PG&E has the most up to date contact information, please send the following to TransmissionPSPSQuestions@pge.com:

  **Name, phone number and email of:**
  - **Primary contact** that is available 24/7
  - **Secondary contact**
We will only restore power when we are certain it is safe to do so. We expect to be able to visually inspect the lines triggering the PSPS decision for damage and restore power to most of our customers **within 24 to 48 hours after weather has passed**.

<table>
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<tr>
<th>WEATHER ALL CLEAR</th>
<th>PATROL &amp; INSPECT</th>
<th>ISOLATE &amp; REPAIR DAMAGE</th>
<th>RESTORE POWER</th>
<th>NOTIFY CUSTOMERS</th>
</tr>
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<td>After the weather has passed and it’s safe to do so, our crews begin patrols and inspections.</td>
<td>Crews visually inspect our electric system to look for potential weather-related damage to the lines, poles and towers. This is done by vehicle, foot and air during daylight hours.</td>
<td>Where damage is found, crews work to isolate the area so other parts of the system can be restored. Crews work safely and as quickly as possible to make repairs.</td>
<td>Once it is safe to energize, a call is made to the PG&amp;E Control Center to complete the energization process. Power is then restored.</td>
<td>Cities, counties, agencies, municipal utilities and customers are notified that power has been restored.</td>
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Because weather events can last several hours or days, for planning purposes, we suggest customers prepare for outages that could last longer than 48 hours.

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