2021 PSPS Events (8/17, 9/20, 10/11 & 10/14)

AFTER ACTION REPORT

Emergency Preparedness and Response

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Introduction

The Public Safety Power Shut Off (PSPS) program includes activities supporting information gathering, decision making, and customer outreach processes when Pacific Gas and Electric (PG&E) considers proactively de energizing portions of the PG&E electric system in the interest of public safety. A PSPS Event occurs when a combination of winds and location specific factors are forecast to present a statistically high likelihood of damage or disruption to PG&E's above ground power lines, suggesting a heightened risk of a catastrophic wildfire, therefore line de-energization may be necessary.

In 2021, PG&E had four PSPS events that occurred consecutively in the early fall months from August to October with the last two occurring in the same Emergency Operations Center (EOC) activation within a few days apart. Due to the frequency and relative closeness of the events, the after-action reports for the four events are outlined into the following singular report. The Improvement Plan and corrective actions are combined in this document to prevent duplicative initiatives and efforts.

8/17/2021 PSPS Event Incident Overview

8/17/2021 PSPS Event

Incident Overview

Meteorological reports and warnings issued from three Federal forecast agencies on the fire risk due to weather forecast models showed a strong wind event between Tuesday August 17 to Wednesday August 18. High resolution forecast models indicated potential for maximum wind gusts from 30 – 45 mph with isolated gusts to 50+ mph with low relative humidity, thus a PSPS event was initiated, and the EOC was activated on Sunday August 15, 2021 at 13:00.

On August 17, 2021, 17:00, PG&E began de-energizing its assets and customers across the Southern Cascades, Northern Sierra foothills, Sacramento Valley, and elevated terrain of Humboldt and North Bay regions. PG&E weather stations recorded wind gust speeds of up to 56 mph in areas impacted by the event and was able to prevent the de-energization of more than 100,000 customers through sectionalization and the deployment of temporary generation microgrids.

Once the wind event had passed and it was safe to patrol and restore, PG&E deployed more than 1,300 ground units and 33 helicopters to patrol roughly 3,600 miles of distribution circuits and impacted assets. This effort identified 10 incidents of damages or hazards resulting from high winds experienced in the de-energized areas, which further indicated the strength of this wind event. Within 24-hours of the wind event, more than 99% of customers had been re-energized despite the challenging situation of ongoing wildfires present including the Dixie, Monument and McFarland Fire footprints.

The EOC deactivated on August 19, 2021 at 19:30 and restored power to 48,155 customers for this event.

ACTIVATION DATES

8/15/2021 – 8/19/2021

LEVEL

4

THREAT/HAZARD

PSPS

ACTIVATED EOC TEAMS

- Hotel - Day
- Golf - Night

ACTIVATED REC & OEC'S

- Northern REC
  - Humboldt OEC
  - North Bay OEC
  - North Valley OEC
  - Sacramento OEC
  - Sonoma OEC

9/20/2021 PSPS Event Incident Overview

Incident Overview

Meteorological reports informed that a weather system moving onshore across Northern California would result in breezy winds in areas where dry fuel conditions persist in combination with decreasing relative humidity. The weather reports indicated high possibility for reaching thresholds for PG&E needing to execute a PSPS Event. The EOC initiated its readiness posture and activated on September 17, 2021 at 16:00. The preparations for assessing conditions, working with customers, and communicating with all stakeholders were underway.

On September 20, 2021, 05:30, PG&E began de-energizing its assets and customers to mitigate catastrophic wildfire risk across the west side of the Sacramento Valley, Lake County, the Napa Hills, and the far Southern extent of the Sierra. Further de-energizations began September 20, 2021, 22:00 PDT for the southern regions in Santa Barbara County and the Tehachapis. PG&E weather stations recorded wind gusts of up to 48 mph in counties impacted by the event and 2,968 customers were de-energized, 750 of which only experienced a 23-minute outage. PG&E mitigated and therefore avoided the de-energization of approximately 19,400 customers through sectionalization while approximately 15,000 customers were removed from scope due to real time changes in the Fire Probability Index (FPI) due to the precipitation that preceded the event.

Once the wind event had passed and it was safe to patrol and restore, PG&E deployed more than 550 personnel and nine helicopters to patrol roughly 260 miles of distribution circuits and impacted assets. There were zero identified incidents of damages or hazards however line slap or other issues such as branches blowing onto wires and off again may have occurred. All customers were restored within 24-hours of the wind event and the EOC deactivated on September 21, 2021 at 18:00.

9/20/2021 PSPS Event

ACTIVATION DATES

9/17/2021 – 9/21/2021

LEVEL

4

THREAT/HAZARD

PSPS

ACTIVATED EOC TEAMS

- Golf – Day
- Hotel – Night
- Bravo – Day
- Alpha - Night

ACTIVATED REC & OEC'S

- Northern REC
  - Humboldt OEC
  - North Bay OEC
  - North Valley OEC
  - Sacramento OEC
  - Sonoma OEC

10-11/10-14 PSPS Event Incident Overview

10-11-21 PSPS Incident Overview

On Thursday, October 7, 2021, weather forecast models began to show the potential for a dry, northerly wind event late Sunday night through Tuesday afternoon. Some forecast models indicated that dry and breezy north-northeast winds, coupled with dry fuels and low relative humidity, would lead to a period of increased fire danger across the Southern Cascades, Northern and Central Sierra foothills, western Sacramento Valley and some foothill locations surrounding the San Joaquin Valley. During the morning hours of October 8, federal forecast agencies began to issue warnings for the upcoming event with Fire Weather Watches being issued from the Eureka, Monterey, and Sacramento NWS offices. Pressure gradient forecasts from Medford to Redding and Redding to Sacramento indicated the potential for a strong northerly wind event as well.

The EOC was activated on October 8 at 12:00 for a PSPS event. During the overnight hours of Friday, October 8, weather models strengthened. The increase in winds were most noticeable along the western side of the San Joaquin Valley and across the North Bay Hills. The PSPS scope was adjusted to account for the increased strength of the event.

On October 11 at 06:00, PG&E began de-energizing its assets and 23,504 customers across the Northern Sierra foothills, Western Sacramento Valley and adjacent terrain, Bay Area hills, Diablo Range, Central Coast region, and Southern Kern County. Winds materialized as expected in most areas, and the weather stations recorded wind gusts of up to 102 mph.

Once the wind event had passed and it was safe to patrol and restore, PG&E deployed approximately 1,200 personnel and 35 helicopters to patrol roughly 2,500 miles of distribution and transmission circuits and impacted assets. This effort identified 8 incidents of damages or hazards resulting from high winds experienced in the de-energized areas.

10-14-21 PSPS Incident Overview

On October 10, the Meteorology Team noted a potential weather event and notified the acting EOC Incident Commander providing an overview of the potential event. The EOC, already activated for the October 11 PSPS event, remained open for another potential PSPS event.

An initial PSPS scope was developed on October 10, as models began to hint at the development of a northerly wind event that would impact portions of the Northern Sierra, Northern and Western Sacramento Valley, elevated North Bay terrain, and the Tehachapi foothills. The weather

10-11/10-14 PSPS Event

ACTIVATION DATES

10/8/2021 – 10/16/2021

LEVEL

4

THREAT/HAZARD

PSPS

ACTIVATED EOC TEAMS

- Foxtrot – Day
- Echo – Night
- Hotel – Day
- Golf – Night

ACTIVATED REC & OEC'S

- Northern REC
  - Humboldt OEC
  - North Bay OEC
  - North Valley OEC
  - Sacramento OEC
  - Sonoma OEC
- Bay/Central REC
  - Diablo OEC
  - Mission OEC
  - Stockton OEC
  - Yosemite OEC

forecast models were closely monitored, from October 11 through October 14, PG&E further refined the PSPS scope. Weather conditions in some portions of scope trended less severe than previous forecasts that were used to scope these areas for PSPS had predicted; as the weather conditions improved, these areas with approximately 28,000 customers were removed from PSPS scope.

On October 15, 2021, at 01:00, PG&E began de-energizing its assets and customers across the Tehachapi foothills presented by the Santa Ana wind event. Wind gusts near 50 mph were recorded during the event.

On October 15, 2021, at 12:00, the Weather “All-Clear” was given for all circuits in zones 445, 448A, 448B, and 651, apart from 2 devices on the Tejon 1102 circuit that serve segments in the higher elevations in the Tehachapi mountains. These devices were declared all clear on October 16, 2021, once winds subsided. During this PSPS event, PG&E ultimately de-energized 666 customers in one Time Place (TP) in Kern County. PG&E mitigated and therefore avoided the de-energization of approximately 4,700 customers in the final scope using sectionalization devices and backup power support.

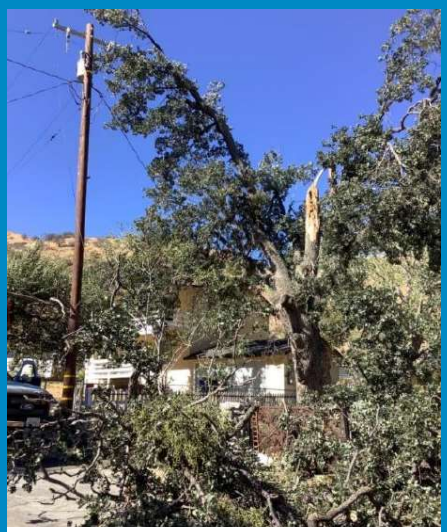
Once the wind event had passed and it was safe to patrol and restore, PG&E deployed approximately 50 personnel and one helicopter to patrol roughly 60 miles of distribution circuits and impacted assets. This effort identified one damage incident resulting from high winds experienced in the de-energized areas. PG&E re-energized all customers within 24-hours of the wind event and the EOC deactivated October 16, 2021 at 17:45.

Damage Summary

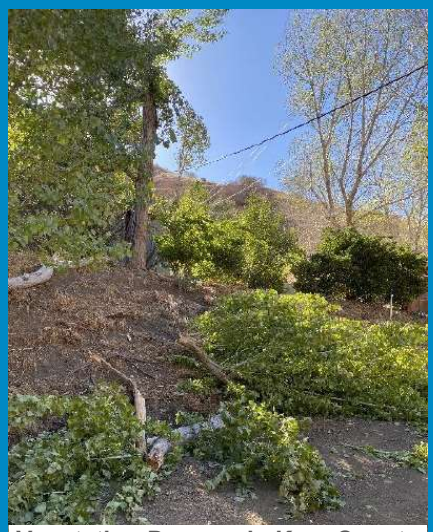
	8/17/2021 PSPS Event	9/20/2021 PSPS Event	10/11/2021 PSPS Event	10/14/2021 PSPS Event
Customers De-energized	48,155	2,968	23,504	666
# Of Counties	13	8	23	1
Recorded Wind Speed	56 mph	48 mph	102 mph	50 mph
CRC's Opened	34	9	24	11
Damages	10	0*	8	1

*While no damages and hazards were found on the 9/20/2021 PSPS Event, line slap or other issues (e.g., branch blowing onto wires and off again) may have occurred during the wind event

Vegetation-Hazard in Napa County
Tree Branch on Line
8/17/2021 PSPS Event



Vegetation-Damage in Kern County
Tree Limb fell onto primary
10/11/2021 PSPS Event



Vegetation-Damage in Kern County
Tree fell on Service Line
10/14/2021 PSPS Event

Various photos PSPS Event's damage and restoration efforts

Incident Analysis

This After-Action Report (AAR) outlines some of the response strengths and identifies areas of the response needing improvement. Areas needing improvement have corrective actions identified that will be implemented through the Corrective Action Program (CAP).

The following are high level findings around areas needing improvement with more details depicted in the Improvement Plan section of this report:

EOC AREAS FOR IMPROVEMENT

- Communications
  - Suppliers were not notified when Customer Resource Centers were requested resulting in delayed preparations.[1]
  - Information on the status and expected timing of deployment and demobilization of generation was not provided from field resources and to the EOC Temp Gen Branch.[2]

- Temp Generation
  - Full disclosure of solar energy is needed when providing Diesel Temp Gen to customers due to potential generator failures.[3]

- Roles and Responsibilities
  - Improvement and defining clear communication roles with external agencies is needed to improve agency interaction and experience.[4][5]
  - No IC script is available for OIC meetings resulting in a potential for meetings to go run long.[6]
  - Some damage is difficult to see in photos attached to damage assessment forms. Field patrollers may need to use more descriptive words on the damage assessment forms or photos need to be improved so damage extent can be clearly seen.[7]
  - EDEC is not included in the Playbook approval queue for review.[8]

- Technology and Tools
  - The EOC lacks a common operating picture which causes difficulty in communication and coordination between EOC, REC, and OECs.[9]
  - Foundry had a limitation on number of time places[10] and the Foundry report was not aligned in all clears with the counties.[11]

[1] See Appendix A: Improvement Plan – Category: Communications, Line 2a
[2] See Appendix A: Improvement Plan – Category: Communications, Line 2c
[3] See Appendix A: Improvement Plan – Category: Temp Gen, Line 1c
[4] See Appendix A: Improvement Plan – Category: Communications, Line 2b
[5] See Appendix A: Improvement Plan – Category: External Agencies, Line 3a
[6] See Appendix A: Improvement Plan – Category: Procedure, Line 2b
[7] See Appendix A: Improvement Plan – Category: Process Correction, Line 4b
[8] See Appendix A: Improvement Plan – Category: Process Correction, Line 4f
[9] See Appendix A: Improvement Plan – Category: Technology, Line 8b
[10] See Appendix A: Improvement Plan – Category: Technology, Line 8c
[11] See Appendix A: Improvement Plan – Category: Technology, Line 8d

- PSPS-Specific Areas of Improvement are described in the CPUC 10-day reports that include the following items:
  - Confusion on the nomenclature used for All Clear Zones.
  - Delays in creating Restoration Playbooks after each All-Clear Declaration meeting.
  - During the 9/20/21 PSPS Event, approximately 750 customers were de-energized for 23 minutes due to de-energization operations. These customers were not originally in scope for de-energization and thus were not notified prior to the 23-minute outage.
  - Circuit going through two TPs not de-energized due to being assigned to a TP that was delayed/cancelled.
  - The process for identifying and including high risk tags into our PSPS scope took longer than expected for both the October 11 – 12 and October 14 – 16 PSPS events.
  - Due to manual edits needed to customer notification files, select customers received Watch Notifications instead of Warning Notifications during the October 11-12 PSPS event.

The following are strengths that can be used as best practices in future events:

EOC STRENGTHS

- The Bridge Lines and dedicated Huddle Chats among sections were functional and helpful because the open Bridge Line helped facilitate communications about de-energizations and All Clears. The virtual EOC tools provided clear coordination because the notification process is centralized and improves general situational awareness.
- The teams are showing obvious improvements with each activation and demonstrated excellent teamwork and diversity of thought. The team came together, listened to one another, and aligned on the path forward. Inter-team communication was excellent with people across and within sections assisting others as needed and happily.
- The effort each night to review switching times and ETOR timeframes was a new process element and an excellent opportunity to pull in the switching timeframes to reduce outage time and pull in ETORs to establish a new objective that pushes restoration timeframes.
- Strong coordination with the EOC Safety staff and the REC Safety officers and Field Safety staff as well as the strong focus on safety and self-care for the overnight shift was powerful.

The Improvement Plan is used by PG&E to identify training gaps, improve processes, and insert areas for improvements into new or current work streams utilizing the Correction Action Program (CAP). They are designed to be specific, measurable, actionable, and implemented according to deadlines. The completed CAP's will better prepare the company for the next emergency event and reduce overall risk.

Conclusion

The PG&E service territory has been in extreme drought conditions with record low fuel moisture values for fall season of this year. The 8/17, 9/20, 10/11, and 10/14 PSPS events were strenuous and provided an opportunity to test PG&E's PSPS plans and protocols. From a PSPS technical perspective, the event enabled the company to continue to verify and test its PSPS Protocols and Guidance, and exercise and improve its continued practices of avoiding duplicate notifications, conducting meteorology check-ins, All-Clear Zone methodology, and other protocols.

Each PSPS event presented challenges that are described in the Improvement Plan and the CPUC 10-day reports with the most common area of improvement being delayed communications and/or work processes that results in further delays of notifications or report creations. Improving the minor bottle necks will provide further stream-lined work processes for future events. The EOC's successful best practices were utilizing the virtual EOC tools to keep lines of communication constantly open and the flexibility of the team to continuously address and adapt to requests and changing event conditions. The EOC demonstrated extraordinary teamwork and worked tirelessly to protect public safety in minimizing customer impact during de-energizations.

PG&E identified multiple records of damages or hazards to service lines following the 2021 PSPS events that potentially prevented catastrophic wildfire in the recorded weather conditions of low humidity and high wind speeds. PG&E will continue to verify and test its PSPS plans and protocols through future exercises and potential events to prevent catastrophic wildfire from potential damage during PSPS events.

Appendix A: Improvement Plan

Category	PSPS Event	#	Area for Improvement	Responsible FA	CAP Needed/Notes
Temp Generation	8/17/2021	1a	There were generator failures at Calistoga.		
	8/17/2021	1b	Mobilization was cancelled too frequently possibly due to the ad-hoc back-up generation mobilization decisions.		
	10/11/21 + 10/14/21	1c	When providing Diesel Temp Gen at Coyote Valley School in Middletown, the school has solar energy and did not disclose that information at the time which caused the generator to fail because the solar back fed into the generator.		
Communications	8/17/2021	2a	There is an opportunity to notify our suppliers as soon as Customer Resource Centers (CRC) are requested in order to ensure the suppliers are prepared and ready to process our requests more efficiently.		
	8/17/2021	2b	There is unclear communication structure with external agencies, for example Cal OES was contacting various people within Liaison most likely due shift changes.		
	10/11/21 + 10/14/21	2c	There is a significant delay in getting information from the field resources and contractors about the status and expected timing of deployment and demobilization of generation to the EOC Temp Gen Branch. For example, the EOC Temp Gen Branch does not learn that a customer has been switched over to gen until several hours after the fact (and sometimes we learn from the customer themselves or the customer rep).		
	10/11/21 + 10/14/21	2d	There were conflicting meetings and huddles which caused some people to miss updates from the Operations Briefings.		
External Agencies	9/20/2021	3a	Communication roles with external agencies are not clearly defined, for example, the OES AREP expressed concern and confusion surrounding information paths and the AREP utilization or consistency of it.		
	9/20/2021	3b	There is an opportunity to have and maintain a live list of meeting links for AREPS or improve sending out external links to AREPS more efficiently so that external contacts such as OEC will be aware.		

Category	PSPS Event	#	Area for Improvement	Responsible FA	CAP Needed/Notes
Process Correction	8/17/2021	4a	Logistics lacks a resource tracking system that shows where things are or have been sent.		
Process Correction	9/20/2021	4b	There is an opportunity for the field patrollers to use more descriptive words on the damage assessment forms when the damage is difficult to see in photos or improve the photos at the site so damage extent can be clearly seen.		
Process Correction	9/20/2021	4c	There is a discrepancy between the customer numbers between the Sit Report and Restoration View which results in misaligned data for the State Executive Briefing Deck and the Cal OES forms, specifically regarding: highest peak of customers de-energized, total impacted customers, and active vs. inactive customers.		
Process Correction	10/11/21 + 10/14/21	4d	The all-clear zones under consideration were not shared to the HAWC/Meteorology team prior to the All-Clear (OIC Decision F) meetings which resulted in a scramble of pulling the information together during the call.		
Process Correction	10/11/21 + 10/14/21	4e	The CRC support staff were unable to access some of the CRC sites for the build and demobilization due to lack of lock boxes to store keys which causes a delay in completing the work.		
Process Correction	10/11/21 + 10/14/21	4f	Every change to the Playbook should be sent to EDEC for review. Due to not having EDEC review in the approval queue, it resulted in two errors that were found late.		
Procedure	10/11/21 + 10/14/21	5a	There lacks an established IC script for OIC meetings in order for new IC's/Deputy IC's to step in to lead when needed.		
OMT	8/17/2021	6a	There is an opportunity to review and/or develop the Customer-Owned-Line process because of the significant delay in being able to re-energize the Chateau Calistoga Mobile Home Park until the afternoon of 8/18. Another issue is that Customer-Owned-Lines currently do not display differently in OMT which would have helped a Trouble person better assess the situation and potentially reduce a few locations from the scope.		
Process Improvement	9/20/2021	7a	There is an opportunity for the Demobilization communication plan to include the R&R guidance from the HR team.		

Category	PSPS Event	#	Area for Improvement	Responsible FA	CAP Needed/Notes
Process Improvement	9/20/2021	7b	There is an opportunity to standardize the use of a singular Shape file type, for example the HAWC was unable to use SQL server files which resulted in creating an interim workaround for Shape files to be back generated from Viewer.		
Technology	8/17/2021	8a	There is an opportunity to create PSPS Viewer files for all planned temporary microgrids.		
	8/17/2021	8b	There is a lack of a Common Operating Picture (COP) for EOC activations.		
	9/20/2021	8c	Foundry had a limitation on the number of time places that resulted in creating a workaround to be able to raise the limit from 15 to 23 during the event.		
	9/20/2021	8d	The Foundry report was not aligned in all clears with the counties which resulted in doing the report manually with excel and formulas as a workaround.		

Appendix B: Acronym List

Acronym	Meaning
AFN	Access and Functional Needs
ARCOS	Automated Roster Call Out System
CalOES	California Office of Emergency Services
CAP	Corrective Action Program
CERP	Company Emergency Response Plan
CRC	Community Resource Centers
CRESS	Corporate Real Estate Strategy & Services
DCC	Distribution Control Center
EDEC	Electric Distribution Emergency Center
EEI	Essential Elements of Information
EFS	Emergency Field Site
EP&R/SE	Emergency Preparedness & Response/Strategy & Execution
ETEC	Eclectic Transmission Emergency Center
ETOR	Estimated Time of Restoration
GCC	Grid Control Center
GIS	Geographic Information System
Gov Rel	Government Relations
HR	Human Resources
IAP	Incident Action Plan
ICS	Incident Command System
IMT	Incident Management Team
IT	Information Technology
LNO	Liaison Officer
LOB	Line of Business
LOG	Logistics
MA	Mutual Assistance
OEC	Operations Emergency Center
OIS	Outage Information System
OMT	Outage Management Tool
OP	Operational Period
OPS	Operations
PG&E	Pacific Gas and Electric
PMO	Project Management Office

Acronym	Meaning
PSPS	Public Safety Power Shutoff
QEW	Qualified Electrical Workers
REC	Regional Emergency Center
SitRep	Situation Report
SOPP	Storm Outage Prediction Project