PACIFIC GAS AND ELECTRIC COMPANY

ANNUAL REPORT ON COMPLIANCE FOR 2021 WILDFIRE MITIGATION PLAN

MARCH 31, 2022

Pacific Gas and Electric Company
Annual Report on Compliance for 2021 Wildfire Mitigation Plan
(March 31, 2022)

I. INTRODUCTION

In compliance with the Office of Energy Safety and Infrastructure's (Energy Safety) *Compliance Operational Protocols* issued on February 16, 2021 (Protocols) and California Public Utilities Code Section 8386.3(c)(1), Pacific Gas and Electric Company (PG&E) respectfully submits its Annual Report on Compliance for its 2021 Wildfire Mitigation Plan (WMP) for the calendar year 2021 (2021 Annual Report).

In completing the 2021 Annual Report, PG&E has followed the outline provided by Energy Safety in the Protocols. The specific requirements of the Protocols are included in Section II below in italics and bold.

II. RESPONSES TO ANNUAL REPORT ON COMPLIANCE QUESTIONS

a) An assessment of whether the EC met the risk reduction intent by implementing all of their approved WMP initiatives; i.e., the degree to which initiative activities have reduced ignition probabilities;

i. If the EC fails to achieve the intended risk reduction, EC shall provide a detailed explanation of why and a reference to where associated corrective actions are incorporated into their most recently submitted WMP.

PG&E's 2021 risk reduction efforts are linked to our ability to complete our 2021 WMP commitments and successfully execute our WMP initiatives. In 2021, we identified and tracked 53 commitments that contributed towards our overall 2021 WMP goals to reduce wildfire ignition potential, fire spread, and the impact of Public Safety Power Shutoff (PSPS) events. The 53 commitments focused on wildfire mitigation activities such as risk modeling, system hardening, Enhanced Vegetation Management (EVM), PSPS, and situational awareness. Despite the challenges posed by the COVID-19 pandemic, our team, including both PG&E coworkers and our contractor partners, was able to complete all of the commitments by year end 2021 and in many cases exceeded our quantitative targets, as reflected in Table 1 below:

TABLE 1: 2021 WMP KEY QUANTITATIVE COMMITMENT RESULTS

Plan Area	Wildfire Mitigation Plan Commitment	Target	Actual	% of Plan
Situational Awareness and Forecasting	Enhancements to Weather Station Project (Installations and Optimization)	300	308	103%
	HD Cameras	135	153	113%
Grid Design and System Hardening	PSPS Mitigation – Temporary Distribution Microgrids	5	5	100%
	PSPS Mitigation – Substation Distribution Microgrids	8	9	113%
	Emergency Back-up Generation – PG&E Service & Materials Distribution Centers	23	32	139%
	Remote Grid	1	1	100%
	Distribution Sectionalizing (automated devices)	250	269	108%
	Transmission Switches	29	41	131%
	Distribution line legacy 4C controllers	81	81	100%
	Fuse Savers (Single phase reclosers)	70	71	101%
	Expulsion Fuse Replacement (non-exempt equipment)	1,200	1,429	119%
	Surge Arrester Replacements	15,000	15,465	103%
	System Hardening (line miles)	180	210	117%
	Butte County Rebuild	23	24	104%
	System Hardening - Transmission Conductor	92	104	113%
Asset Management and Inspections	Distribution HFTD Inspections (poles)	480,749	480,749	100%
	Substation HFTD Inspections (substations)	142	142	100%
	Transmission HFTD Inspections (structures)	26,826	26,826	100%
	Infrared Inspections of Transmission Electric Lines and Equipment	4,215	4,211[1]	100%
Vegetation Management and Inspections	EVM (line miles)	1,800	1,983	110%
	VM Transmission Right of Way Expansion	200	218	109%

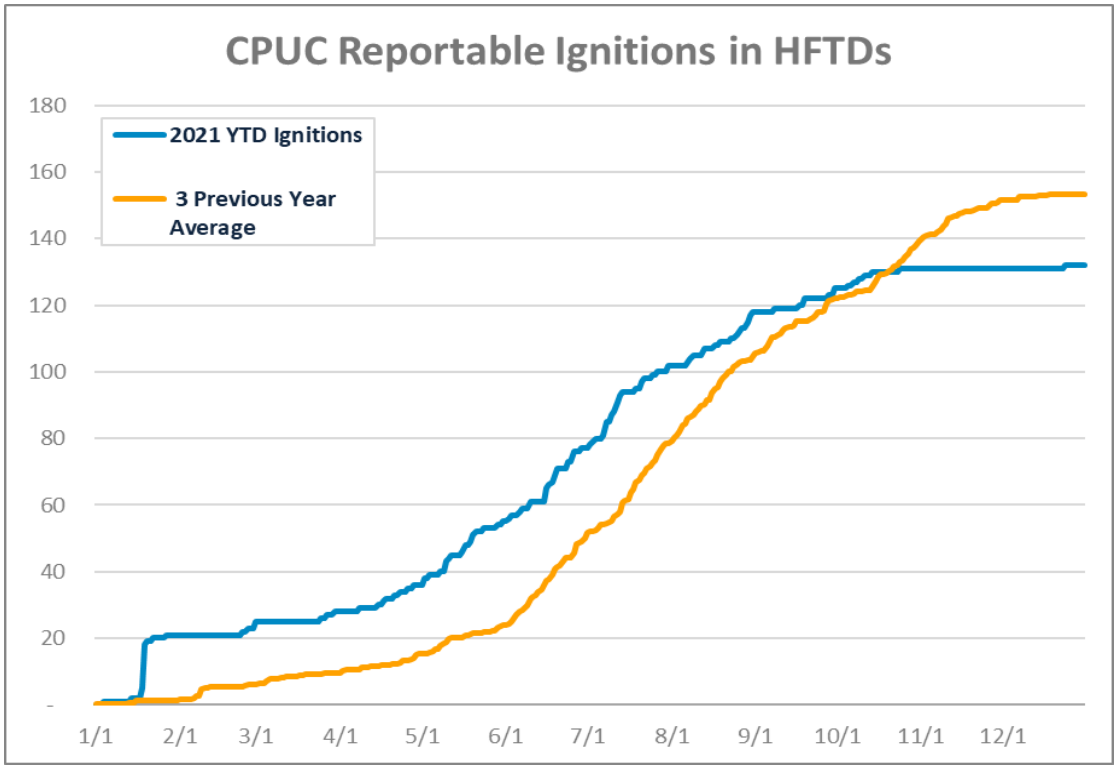
[1] Note: We did not perform four miles of the infrared inspections of transmission electric lines due to the lines being de-energized at the planned time of inspection and not being re-energized until 2022. By the end of 2021, we had completed the 4,211 miles that were energized.

From a timing perspective, 50 of the commitments were completed by the initial target date specified in the 2021 WMP. The remaining three commitments were completed later than the target date included in the 2021 WMP, but were completed by the end of 2021. A summary of the status and performance of all 53 commitments can be found in the Appendix A.

In addition to the information on the 53 commitments provided in Appendix A, we have also provided information on all of the 2021 WMP initiatives in our Quarterly Initiative Update for Q4 2021 (QIU).[2] The QIU contains a quantitative and/or qualitative discussion on the completion of planned work for all 147 initiatives included in the 2021 WMP, which includes the 53 commitments.

Our wildfire mitigation efforts resulted in a reduction of ignitions caused by electrical infrastructure in 2021 as compared to the previous 3-year average, and in particular during the timeframe catastrophic wildfires have historically occurred. Figure 1 below shows the California Public Utilities Commission (CPUC)-Reportable ignitions in High Fire Threat Districts (HFTD) in 2021 was 133 as compared to the previous 3-year average of 154.

FIGURE 1: 2021 CPUC-REPORTABLE IGNITIONS COMPARED TO 3-YEAR AVERAGE



[2] https://www.pge.com/pge_global/common/pdfs/safety/emergency-preparedness/natural-disaster/wildfires/wildfire-mitigation-plan/PGE-2021-Q4-QIU-20220201.xlsx.

b) A full and complete listing of all operational changes made to WMP initiatives, an explanation of why the changes were necessary, and an assessment of whether the changes achieved the same risk reduction intent;

In this section, we provide a description of three categories of operational changes: (1) commitments completed late; (2) commitments and initiatives subject to Change Orders; and (3) operational measures incremental to the 2021 WMP.

1. Commitments Completed Late

Commitment ID D.01 – Distribution HFTD Inspections (Poles): This commitment involved performing enhanced detailed inspections of overhead distribution assets in the following recurrence intervals by July 31, 2021: (1) Tier 3 and Zone 1 – annually; and (2) Tier 2 and High Fire Risk Areas (HFRA) – every three years.[3] This commitment was targeted for completion by July 31, 2021. Although PG&E completed inspections of all assets initially targeted for inspection by July 31, 2021, during record validation, we identified additional poles after July 31, 2021 that should have been inspected. Therefore, as of December 31, 2021, as a result of workplan validation efforts, the target was revised to 480,749 and PG&E has completed enhanced detailed inspections on all 480,749 of these targeted distribution poles.[4]

Commitment ID D.03 – Transmission HFTD Inspections (Structures): This commitment involved performing enhanced detailed inspections of transmission structures and some form of aerial assessment (helicopter, drone, aerial lift, climbing) on the following recurrence intervals by July 31, 2021: (1) Tier 3 – annually; and (2) Tier 2 and HFRA – every three years barring exceptions due to physical conditions or landholder refusals which delay or hinder PG&E access to facilities. This commitment was targeted for completion by July 31, 2021 and PG&E had completed all structures initially targeted for inspection by that date. However, we identified additional structures after July 31, 2021 that should have been included in the initial inspection. These record validation efforts resulted in an additional 19 structures requiring both ground and aerial inspections in which 18 are in Tier 2 High Fire Threat District (HFTD) areas and one in an HFRA being added to the 2021 workplan target after the July 31, 2021 due date. As of

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[3] Note that for all of these inspections, delayed inspections due to access issues caused by physical conditions or landholder refusals are handled on an exception basis and performed once the circumstances are resolved. Thus, inspections delayed due to these circumstances are not considered late.

[4] On November 1, 2021, PG&E submitted a Change Order (November Change Order) to update the target number of distribution poles for this commitment to 477,309, however, as part of the ongoing record validation the target has since been increased to 480,749, as described above. The November Change Order submission can be viewed on PG&E's website linked below: https://www.pge.com/pge_global/common/pdfs/safety/emergency-preparedness/natural-disaster/wildfires/wildfire-mitigation-plan/2021WMP-PGE-Change-Order-2021-11-01.pdf.

December 31, 2021, all known HFTD and HFRA transmission structure inspections have been completed.[5]

Commitment ID I.02 – Trained Workforce for Service Restoration: This commitment included five activities with specific milestone dates for each activity. The first of these five activities was not completed by the target date: to complete Phase III SEMS training (ICS 300/400) for all Command staff and select roles in General staff by June 30, 2021. However, as of November 17, 2021, all required Emergency Operations Center (EOC) staff have completed this training.[6] The remaining four activities were all completed on or before the target date.

We believe that these changes achieved the same, or in some cases better, risk reduction as compared to the initial WMP initiatives. Specifically, by updating our records and adding additional distribution and transmission facilities for inspection, we increased risk reduction by performing inspections of additional facilities.

2. Initiatives and Commitments Subject to Change Orders

PG&E has proposed changes to eight 2021 WMP Initiatives through the WMP Change Order process. Detailed descriptions of the changes, explanations of why the changes were necessary, and an assessment of whether the changes achieved the same risk reduction intent are described in PG&E's November Change Order submission.[7] The initiatives subject to Change Orders based on financial changes are:

1. Initiative 7.3.3.6: Distribution pole replacement and reinforcement, including with composite poles;

2. Initiative 7.3.3.11.1: Mitigation of impact on customers and other residents affected during PSPS event. Generation for PSPS Mitigation;

3. Initiative 7.3.3.12.4: Other corrective action, Maintenance, Distribution; and

4. Initiative 7.3.3.15: Transmission tower maintenance and replacement.

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5 The November Change Order updated the target number of transmission structures requiring enhanced detailed inspections and some form of aerial assessment to 26,810.

6 We note that this does not include new team members who assume a Command & General Staff position due to unexpected vacancies on an EOC duty team.

7 The November Change Order submission can be view on PG&E's website linked below: https://www.pge.com/pge_global/common/pdfs/safety/emergency-preparedness/natural-disaster/wildfires/wildfire-mitigation-plan/2021WMP-PGE-Change-Order-2021-11-01.pdf

The initiatives subject to Change Orders based on changes to the both the targets and finances are:

1. Initiative 7.3.4.1: Detailed Inspections of Distribution Electric Lines and Equipment (Commitment: D.01 – Distribution HFTD Inspections);

2. Initiative 7.3.4.2: Detailed Inspections of Transmission Electric Lines and Equipment (Commitment: D.03 – Transmission HFTD Inspections); and

3. Initiative 7.3.4.5: Infrared Inspections of Transmission Electric Lines and Equipment (Commitment: D.04 – Infrared Inspections of Transmission Electric Lines and Equipment); and

4. Initiative 7.3.3.8.3: Distribution Line Motorized Switch Operator (MSO) Pilot (Commitment: C.01 – Assess Motorized Switch Operator switches);

3. Operational Measures Incremental to the 2021 WMP

In addition to the initiatives outlined in the 2021 WMP, PG&E implemented new operational measures in 2021 to address the extreme drought conditions that occurred during the year. These four additional operational measures, which are summarized below, were intended to further reduce the risk of ignition probability or consequence as opposed to alter the risk reduction of any existing WMP initiatives.[8]

In 2020 and 2021, California had its fifth and second driest water years, respectively, in the last century.[9] PG&E's entire service area experienced extreme and severe drought conditions before the rainstorms that occurred in the latter part of the year. Prior to 2021, most of the total acreage impacted by large wildfires[10] in our service area resulting from electric facilities occurred as a result of ignitions that started during Red Flag Warning (RFW) weather conditions. In 2021, however, the acreage burned by large wildfires occurred as a result of ignitions that started on non-RFW days. Table 2 below highlights this significant change.

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8 Energy Safety requested PG&E report on these additional operational measures at the August 6, 2021 briefing.

9 Water years run from October 1 to September 30. See https://water.ca.gov/-/media/DWR-Website/Web-Pages/Water-Basics/Drought/Files/Publications-And-Reports/091521-Water-Year-2021-broch_v2.pdf.

10 The California Department of Forestry and Fire Prevention defines a large wildfire as 300 acres or more.

TABLE 2: ACREAGE IMPACTED IN PG&E'S SERVICE AREA FROM LARGE WILDFIRES CAUSED BY ELECTRIC FACILITIES

Year	Red Flag Warning Ignition Acres Impacted	Non-Red Flag Warning Ignition Acres Impacted	Ratio of Non-RFW to RFW
2017	228,112	32,063	0.14
2018	243,624	0	0.00
2019	77,758	0	0.00
2020	56,338	696	0.01
2021	0	981,695	N/A

In order to address the rapidly changing climate and extreme drought conditions, PG&E implemented three new operational measures in 2021. These operational measures, which are described below, were intended to further reduce the risk of ignition probability or consequence as opposed to alter the risk reduction of any existing WMP initiatives.

a. Enhanced Powerline Safety Settings (EPSS)

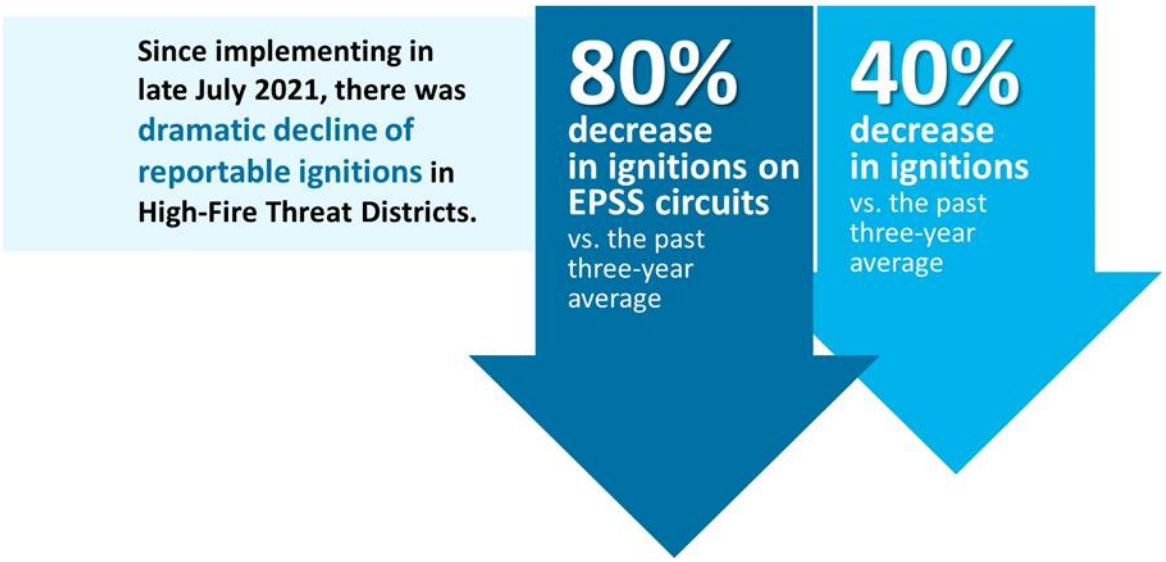
The risk of an ignition event occurs every time there is a fault of any magnitude (fault current),[11] including failures that could emit sparks from overhead assets. Utilities have devices on their system to prevent prolonged fault current by de-energizing the relevant distribution line, much like a household fuse in an electric panel will de-energize for safety. The longer duration that a fault current event occurs, the more wildfire risk is present.

In July 2021, to address the dynamic climate challenge described above, we implemented the EPSS program on approximately 11,500 miles of distribution circuits, or 45 percent of the circuits in HFTD areas. With EPSS, we engineered changes to our electrical equipment settings so that if an object such as vegetation contacts a distribution line, power is automatically shut off within 1/10th of a second, reducing the potential for an ignition. EPSS-enabled settings provide a layer of protection on days when the wind speeds are low. EPSS is especially important during hot-dry summer days, when there are low winds but continued low relative humidity, low fuel moistures levels, and where the volume of dry vegetation, in close proximity to the distribution lines, increases the risk of an ignition becoming a large wildfire.

[11] Fault current is described as abnormal electric current, and usually occurs when electric lines contact external objects or other unintended electric equipment. For example, these incidents can occur when vegetation contacts distribution lines and/or structures; when animals and birds touch or traverse the lines and/or structures; or when, due to other reasons, a component or piece of equipment fails on the circuit.

Once implemented, the results of our EPSS program were significant, leading to a dramatic reduction in CPUC-reportable ignitions as indicated during the remainder of the high fire threat months of August to October, as indicated in Figure 2 below:

FIGURE 2: REDUCTION IN CPUC-REPORTABLE IGNITIONS BETWEEN JULY 28, 2021 AND OCTOBER 20, 2021



As we described in more detail in our 2022 WMP, based on the success of the EPSS program, we plan to expand this program in 2022 to all distribution lines in HFRA and HFTD areas as well as select non-HFTD areas which will significantly increase the ignition risk reduction we can achieve.[12]

b. Additional Aerial Patrols for Prioritized Circuits

To help further address extreme and exceptional drought conditions, PG&E performed additional aerial patrols over specific circuits that had been prioritized for fire potential. Circuits were prioritized by taking fire perimeter data from 2009 to 2020 and overlaying that against the HFTD areas to identify circuits based on overlap between these datasets. Areas with historical fire perimeters were assumed to have higher potential for damaged trees that could fail and, thus, threaten circuits in the immediate proximity. Complete aerial patrols of these circuits were considered appropriate to address the risk associated with the historical fire impact, as well as the fuel and terrain factors that make the surrounding areas equally prone to wildfire. Tranches 1 and 2 of these circuits had moderate to high overlap with HFTD area circuits and were prioritized first. Tranche 3 had low overlap with circuits and fire perimeters and were prioritized after completion of Tranche 1 and Tranche 2.

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12 *See* 2022 WMP, pp. 730-739.

Patrols identified 18 trees for prioritized mitigation due to high risk factors identified during aerial the patrols. After expedited ground inspections were completed, a total of 12 trees were mitigated. Six trees were mitigated as P1 trees indicating immediate or imminent threat to the overhead conductors on the circuits. The remaining six trees were mitigated as P2 trees due to conditions that represented near-term risks that warranted expedited mitigation.

c. Preventative Fire Retardant

The objective of the 2021 Preventative Fire-Retardant Program (PFRP) was two-fold: (1) to attempt to apply retardant to high-risk circuits to mitigate ignition risk during the peak of the wildfire season; and (2) to establish and test the end-to-end process for preventative fire-retardant applications at scale and determine the viability of continued preventative fire-retardant applications at scale in 2022. The PFRP established and evaluated: (1) a risk prioritization methodology; (2) a screening process to ensure that environmentally and culturally sensitive land, agricultural land, and sensitive receptor locations are precluded from applications; (3) a customer engagement program to seek customer approval for applications; and (4) a tactical retardant application protocol.

Between August 13, 2021 and October 15, 2021, the PFRP program applied retardant on poles and underneath conductors along 12.76 miles of spans in Shasta and Solano counties. Applications were halted as winter storms across the PG&E service territory reduced the wildfire risk. Following the completion of its initial bench scale testing of fire retardants and trial of preventative applications in the field in 2021, PG&E determined that additional environmental testing of retardants in outdoor conditions is necessary during the 2022 wildfire season in order to determine whether it is appropriate to conduct preventative fire-retardant applications at scale in subsequent years.

c) Descriptions of all planned WMP initiative spend vs actual WMP initiative spend and an explanation of any differentials between the planned and actual spends;

PG&E is providing an attachment[13] which details the 2021 WMP initiative forecast spend versus actual spend. 2021 Forecast is from the 2021 WMP filing, while the 2021 Actual is from the 2022 WMP filing. Thus, inherently there would be some differences due to re-alignment of costs to the 2022 WMP view. Consistent with the guidance constituting the need for a Change Order, the financial differential variance explanations included herein consists of initiatives that include a change that resulted in an increase or decrease of more than $10 million and constituted a greater than 20 percent change in an initiative's planned total expenditure, based on Energy Safety's guidance for Change Orders.

Overall there were 18 Expense initiatives over the threshold, and 16 Capital initiatives over the threshold. For initiatives over the threshold, in general, they are due to either MAT code/Initiative Realignment (e.g., VM programs forecast re-aligned and consolidated to a handful of initiatives), or business/operational drivers (e.g., strike team efforts to catch up on backlog work). The primary variance drivers for initiatives that meet the threshold are put into

13 *See* PGE_2021 ARC_20220331_Atch01_Variance Explanations.xlsx.

following buckets: Volume, Unit Cost, MAT code or initiative realignment,[14] Non-Unitized program changes. These are identified and explained in tab Expense Summary Columns I through K (for expense) and tab Capital Summary Columns I through K (for capital) of the attachment.

d) A description of whether the implementation of WMP initiatives changed the threshold(s) for triggering a PSPS event and/or reduced the frequency, scale, scope, and duration of PSPS events.

In 2021, PG&E continued to make progress toward both mitigating wildfire risks and reducing customer impacts of each PSPS event. These efforts were largely successful as the PSPS events in 2021 represented a decrease in frequency, scope, and duration in comparison to 2020. Overall, the positive PSPS results in 2021 were a combination of favorable weather conditions, PG&E's continuous improvement based on lessons learned from past PSPS events, and our continuing efforts to listen to our customers and communities to find ways to reduce the impact of PSPS outages without compromising safety. PG&E has learned and improved significantly since we executed our first PSPS event in 2018, and we expect to continue to evolve and improve this critical wildfire risk mitigation program in the coming years. Improvements to our PSPS program have included enhanced operations, communication, and coordination before, during and after PSPS events. Together, these have reduced risk and resulted in more targeted, smaller and shorter events, as indicated Figure 3 below.

[14] Maintenance Activity Type (MAT) codes identify and capture a single category of work as PG&E budgets, tracks, and manages our various utility operations programs. Energy Safety-defined initiatives generally do not line up exactly with the MAT code structure PG&E uses to track our work, therefore there are a number of MAT code to initiative relationships incorporated into our WMP financial data. There are situations where one MAT code is broken into multiple WMP initiatives or where multiple MAT codes combine into one WMP initiative. Due to these relationships, MAT code to WMP initiative realignment can occur based upon changes to the WMP Initiative structure and/or PG&E subject matter expert feedback. As a result, PG&E realigned certain programs from the 2021 WMP to the 2022 WMP and adjusted the financials accordingly to appropriately align the described work of the 2022 WMP initiatives. The impact of these changes on the financial results is identified in the "MAT code or Initiative Realignment" column of the attachment.

FIGURE 3: OVERVIEW OF PSPS PERFORMANCE[15]

In 2021, PG&E restored 96.7 percent of the customers within 24 hours from the termination of the PSPS events. When excluding the January 19, 2021 event that resulted in a massive level of damages that severely impacted restoration, PG&E was able to restore 99.7 percent of the customers within 24 hours in 2021.

The average restoration time for customers experiencing PSPS events was 8.7 hours for the last four PSPS events in 2021.[16] Since the January 19, 2021 PSPS event, PG&E has implemented new standards and procedures to improve our restoration process, leading to a 10.5 percent improvement in comparison with the 2020 average restoration time of 9.7 hours. Additionally, PG&E's average outage duration[17] **(**excluding the January 19th event) is 27.9 hours when compared to 34.5 hours in 2020.

In the remainder of this section, we describe the impact of WMP initiatives on the triggering of a PSPS event and/or reduced the frequency, scale, scope, and duration of PSPS events.

Changes in threshold(s) for triggering PSPS events and impacts on frequency:

- **PSPS Scoping Protocols:** Key improvements in our PSPS protocols in 2021 include enhancements to our Ignition Probability Weather (IPW) Model, Fire Potential Index (FPI) Model, and the integration of Technosylva Fire modeling into our PSPS protocols. In addition to the model enhancements, the PSPS protocols also incorporate tree overstrike and high-risk vegetation and asset tags. To evaluate the

15 Based on a PSPS season average, which would exclude the January 19, 2021 event, the 2021 average restoration time would be 8.7 hours for the 2021 PSPS Season.

16 Excludes the January 19th event as the areas de-energized experienced extremely high winds which caused 423 instances of damage, or approximately one instance of damage per circuit mile. The extensive damage from the January 19 PSPS event increased the time needed to restore customers safely. When including the January 19th PSPS event the average restoration time was 12.1 hours in 2021.

17 Outage duration is defined as the total time between de-energization and re-energization.

impact of our new PSPS protocols on frequency, we performed a 4-year look-back analysis comparing the impact of previous protocols to our new protocols. Using the 2020 PSPS protocols, the four-year look-back analysis resulted in 18 total PSPS events from 2017 to 2020. Under the lookback analysis, the current PSPS protocols lookback analysis produced 19 events. Thus, the current PSPS protocols increased the amount of PSPS events by 1, which represents a 6 percent increase in PSPS frequency over the 4-year look-back. This increase in frequency is driven by the updated meteorology and scoping guidance implemented in 2021 for PSPS, which has enabled PG&E to incorporate additional risks associated with tree overstrike, vegetation, and asset tags. Despite the forecasted increase in PSPS events due to the 2021 PSPS protocols, the impact of PSPS events was decreased as a result of other operational enhancements to reduce the scale, scope, and duration of PSPS events, as detailed below.

Reduced scale and scope:

- **PSPS Scoping Protocols:** Based on the 4-year lookback analysis described above, the average scope of each PSPS event decreased as a result current PSPS protocols. When comparing the 2020 PSPS protocols events to the current PSPS protocols, the average event size of the PSPS events was 40 percent smaller.

- **Sectionalizing Devices:** The deployment of over 290 automated sectionalizing devices (on both the distribution and transmission system) allowed PG&E to target PSPS events more narrowly to the areas where severe weather occurred in 2021.

- **Undergrounding:** PG&E completed 2.7 miles of undergrounding projects in 2021 specifically intended to mitigate PSPS occurrences in the areas where the undergrounding was performed.

- **Granular Restoration – Weather "All-Clear" Targeting:** PG&E's meteorology team implemented the use of temporal weather data to scope impacted geographical areas, known as time places (TP), during the scoping process to ensure that any required de-energizations tracked closely to real time weather conditions. The use of TPs allowed for improved adjustments to scoping and timing of de-energizations due to rapid and unpredicted real time changes in weather. For example, adjustments in TPs due to weather changes can include shifting a de-energization time earlier if the weather threat grows stronger earlier than initially forecasted or delay de-energization if the severe weather is advancing more slowly than forecasted.

- **Timing Enhancements:** PG&E worked to reduce the time it took to 'scope' or translate the impacts of the weather system onto PG&E's assets. This was accomplished by tool enhancements and automation allowing PG&E to quickly update the PSPS event scope during the events. The reduced timing for scoping permitted more time for customer notifications and planning of PSPS mitigation activities, such as Community Resource Centers (CRC) and temporary generation.

Duration:

- **<u>Granular Restoration – Weather "All-Clear" Targeting</u>:** The above activities to reduce the scope and more specifically target PSPS events also contributed to being able to restore power more quickly once a severe weather event passed. In addition, PG&E leveraged improved meteorological capabilities that allowed for more accurate weather "all-clear" targeting and an enhanced system of weather stations and cameras to begin declaring weather "all clears" on a more granular level. This allowed patrol teams to respond sooner to an outage impacted area so customers could be restored earlier as the smaller targeted areas could be declared "all clear" once the weather improved for safe restoration. Based on the improved PSPS event targeting PG&E restored power more than 10.5 percent faster in 2021 after a severe weather event passed, as compared to 2020. On average post-PSPS inspections were completed and power was restored for customers 8.7 hours[18] after the weather "all clear" in 2021, as compared to 10 hours in 2020.

e) A summary of all defects identified by the WSD/Energy Safety within the annual compliance period, the corrective actions taken and the completion and/or estimated completion date.

1. Inspection Reports

For 2021, Energy Safety inspections began in January and continued until April, at which point there was a pause on Energy Safety inspections as they transitioned from the California Public Utilities Commission to the California Natural Resources Agency. During the 2021 compliance period, Energy Safety provided a total of 29 inspection reports for inspections on approximately 300 PG&E assets, both in HFTD and non-HFTD areas. From the inspections, Energy Safety reported a total of 57 defects. A monthly breakdown of defects is shown below in Table 4.

TABLE 4: TOTAL OF MONTHLY DEFECTS IDENTIFIED BY ENERGY SAFETY

Jan	Feb	Mar	Apr	Total
7	**18**	**29**	**3**	**57**

In response to each defect, PG&E typically took the following actions:

1. Reviewed each defect to confirm non-compliance via desktop assessment and (where deemed necessary) field assessment.

[18] This number excludes the January 19, 2021 PSPS event as the areas de-energized experienced extremely high winds which caused 423 instances of damage, or approximately one instance of damage per circuit mile. The extensive damage from the January 19 PSPS event increased the time needed to restore customers safely. When including the January 19 PSPS event the average restoration time was 12.1 hours in 2021.

2. If a non-compliance was confirmed, we identified and/or initiated corrective actions.

3. Prepared and submitted a response summarizing our assessment findings and corrective actions to Energy Safety.

PG&E tracks corrective actions and commitments made in the inspection responses. The corrective action resolution timeline for the defects identified during inspections is based on the risk category (e.g., Severe, Moderate, Minor) assigned by Energy Safety.

a. Summary of findings

The corrective action status of the 57 defects identified in 2021 is summarized below. Please see attachment "*PGE_2021 ARC_20220331_Atch02_Defects_ Summary.xlsx"* for further details on the defects identified in 2021, the corrective actions taken, and the completion dates.

In general, the 57 defect findings from Energy Safety resulted in the following actions:

- 37 defect findings were remediated in the field. PG&E confirmed the remediation through the creation and closure of a work order or electric corrective (EC) notification, and/or capturing photos validating that the asset is compliant.

- 20 defect findings did not require any corrective action by PG&E. PG&E reviewed the conditions identified and determined the conditions did not meet the Energy Safety's definition of a defect at the time the report was received; therefore, no action was required. PG&E leveraged the following processes to make these determinations: (1) field site visits (7 instances); (2) clarifying rule interpretations (6 instances); and (3) scheduling of Enhanced Vegetation Management (EVM) work in progress (7 instances).

b. Completion Date and/or Estimated Completion Date

PG&E has collaborated with Energy Safety on each of the 57 defect findings identified by Energy Safety and either remediated the defect or determined that remediation was not necessary because the finding did not meet the statutory definition of a defect. Therefore, there are no outstanding defects from the 2021 compliance period to be completed or estimated completion dates to provide.

CONCLUSION

PG&E appreciates the opportunity to provide a summary of our compliance with the 2021 WMP. As outlined above, and described in PG&E's 2022 WMP, a substantial amount of progress has been made but much work yet remains to be done. Through the implementation of our annual WMPs, we have learned lessons, identified improvements, and we continue to refine and increase our wildfire risk mitigation efforts. PG&E looks forward to continuing to work with Energy Safety and other stakeholders on developing, implementing, and improving programs and initiatives that reduce the risk of catastrophic wildfire throughout our service territory.

APPENDIX A: 2021 WMP COMMITMENTS AND PERFORMANCE[19]

2021 Commitments	WMP Commitment	Summary of 2021 Performance
A.01 - Match drop simulations (24 additional hours of forecast data)	Enhance the wildfire spread project in 2021 by expanding the forecast horizon from three to four days.	After completing testing through Information Technology (IT) and Technosylva, the new version of Wildfire Analyst (WFA) was available for install on 7/15/2021. The new version of WFA included multiple new features as well as an additional 24+ hours of forecast data. The version prior to the upgrade displayed 88 hours of forecast data, while after the update, 115 hours were available for display. This added an additional 27 hours of forecast data.
A.02 - Match drop simulations (update fuel model layers)	Update the fuel model layers on annual basis (Technosylva).	After completing testing through IT and Technosylva, the new version of WFA was available for install on 7/15/2021. The new version of WFA included multiple new features as well as the most up-to-date fuel model map. This represents the annual 2021 release of the map that is being used in fire simulations going forward. This was verified through viewing the new fuel model map in the WFA application once it was updated, and verified during the 7/27/21, "what's new" training hosted by Technosylva. This project has now met its annual target.
A.03 - Re-Train Vegetation and Equipment Probability of Ignition Models	PG&E's Vegetation Probability of Ignition and Equipment Probability of Ignition Models will see more improvements with another year of data (2020) incorporated.	Initial alpha versions of the vegetation and equipment models have been produced with the updated data sets. The Vegetation and Equipment Probability of Ignition models have been updated with the 2020 outages and ignitions, along with PSPS damages.

[19] Color code legend: Blue Fill = Commitment was completed on time; Orange = Commitment was completed late (i.e., after the due date in the WMP).

APPENDIX A: 2021 WMP COMMITMENTS AND PERFORMANCE (CONTINUED)

2021 Commitments	WMP Commitment	Summary of 2021 Performance
A.04 - Risk Mapping Improvements (Transmission	Improve Transmission Risk Modeling to provide more standardized wildfire risk mapping/ranking between the various controls and mitigations. In 2021, the Technosylva wildfire consequence information will be combined with the Operability Assessment (OA) Model asset failure probability information to provide more standardized wildfire risk mapping/ranking between the various voltage classes.	The integration of Technosylva wildfire consequence information with the OA Model has been completed. Both enhancements have been implemented in the OA Model. Tier 2 and Tier 3 HFTD quantitative outputs for Transmission assets are incorporated into the model. Refined corrosion data is also incorporated into the OA Model. This meets the annual target and completes the WMP commitments for 2021 version of the OA Model.
A.05 - Risk Mapping Improvements (Distribution)	Improve Distribution Risk Modeling to include: (1) ability to compare wildfire risks for different risk drivers, (2) ability to measure the risk reduction of specific mitigations, (3) add wildfire risk values for distribution line locations beyond the HFTD and HFRA areas to include all of PG&E's distribution lines.	PG&E has developed the capability to composite risk values (the ability to composite or add sub-model results together to produce the total risk at a location). PG&E has developed the ability to measure risk reduction for individual mitigations along the distribution system. The Wildfire Distribution Risk Model or WRM v3 will also add ignition risk capabilities for distribution assets such as support structures and transformers. In addition, PG&E has expanded the wildfire consequence mapping to additional areas beyond the HFTD, known as the HFRA. The new process steps, internal reviews and external validation have shifted the approval of models to 12/15/2021 Wildfire Risk Governance Steering Committee meeting.

APPENDIX A: 2021 WMP COMMITMENTS AND PERFORMANCE (CONTINUED)

2021 Commitments	WMP Commitment	Summary of 2021 Performance
A.06 - Model PSPS customer impacts at circuit level	Develop a more granular, circuit level model, to assess PSPS customer impacts. PG&E will continue to leverage our current weather driven risk maps and modeling data to inform wildfire mitigation activities.	PG&E has completed this commitment and shared the development and solicited feedback during a meeting with Energy Safety on 9/22/21. In addition, PG&E has also shared materials on this commitment at a public Energy Safety workshop on 10/5/21.
B.01 - Numerical Weather Prediction	PG&E will make enhancements to numerical weather prediction program. These enhancements include the following: 1. Expand the historical weather climatology at 2 x 2 km resolution to back-fill all of 2020; 2. Explore a methodology to back-fill the climatological data each quarter moving forward; 3. Evaluate extending the deterministic forecast to provide another 24 hours of forecast data (from 105 hours currently to 129 hours); and 4. Evaluate if the POMMS-EPS ensemble mean is more or less accurate than the deterministic POMMS model.	Program has completed all four of the milestones for this commitment: 1. The historical weather climatology at 2 x 2 km resolution was back-filled with all of 2020; 2. We explored a methodology to back-fill the weather climatological data each quarter moving forward and a contract was executed with the vendor DTN to produce the historical data after each quarter on a rolling basis; 3. The forecast model duration has been expanded out 24 hours and forecast model now provides 129-hour forecasts; and 4. The evaluation of the POMMS ensemble mean predictive skill versus the deterministic.

APPENDIX A: 2021 WMP COMMITMENTS AND PERFORMANCE (CONTINUED)

2021 Commitments	WMP Commitment	Summary of 2021 Performance
B.02 - Enhancements to Fuel Moisture Sampling and Modeling efforts	In 2021, PG&E plans to achieve the following to enhance our Fuel Moisture Sampling and Modeling efforts: Expand the historical Dead Fuel Moisture (DFM) and Live Fuel Moisture (LFM) climatology at 2 x 2 km resolution to back-fill all of 2020.	Meteorology worked closely with vendor Atmospheric Data Solutions (ADS) to extend the historical climatology of DFM and LFM at 2 x 2 km resolution every hour through 2020. This was accomplished by using the 2020 weather climatology at the same resolution, then running the DFM and LFM code to produce output for 2020. This work was reported completed by ADS and was verified by PG&E data scientists through the following weeks. It was used to help train the new 2021 version of the FPI.
B.03 - Enhancements to Fuel Moisture Forecasting	Evaluate extending the deterministic DFM and LFM forecast to provide another 24 hours of forecast data.	ADS completed the DFM and LFM 24 hour forecast extension in early February 2021
B.04 - Enhancements to Weather Station Project (Installations and Optimization)	We will install or optimize the location of 300 weather stations throughout PG&E's territory. We will also continue to work with local, state and federal stakeholders to optimize PG&E's weather station network for external uses.	By the end of December 2021, PG&E had installed 308 weather stations, surpassing the YTD Target of 300 by 8.
B.05 - Enhancements to Weather Station Project (Wind Gust Model)	Develop a weather-station specific wind gust model based on machine-learning or statistical techniques.	ADS built machine learning (ML) wind gust forecasts for ~200 weather stations throughout the PG&E territory. The ADS ML wind gust model continues to run in PG&E's AWS environment and produce output. Finally, PG&E data scientists built a web application where model output stored in AWS could be visualized for each weather station.

2021 Commitments	WMP Commitment	Summary of 2021 Performance
B.06 - Medium- to Seasonal-Range Diablo Wind Forecasting	In 2021, PG&E plans to develop and deploy a seasonal Diablo wind report based on statistical, machine learning and/or AI techniques. A longer lead-time of an upcoming offshore, Diablo wind events would provide crucial preparation time for PG&E and potential communities impacted by these events.	PG&E has worked with ADS to develop a diablo wind index to determine a list of Diablo wind days from historical data. Ultimately, ADS data scientists developed a machine learning model that uses teleconnections, sea surface temperatures and others to then predict the approximate number of Diablo wind events that can be expected in the next 2 to 3 months. Based on this new model, ADS delivered the Diablo wind outlook on August 12th, which predicts a slightly above normal number of Diablo wind events compared to the long-term average for the 2 – 3 months ahead period.
B.07 - Information Sharing	In 2021, PG&E plans to adjust the public 7-day forecast to provide more granularity and clarity around the potential for a PSPS event possibly by county. This forecast is aimed at providing as much lead time as possible for the public to prepare for a possible PSPS event.	The new 7-day forecast is now live. A forecast template has been created, reviewed, and directionally approved. This will improve customer awareness and communication in regard to the public facing PSPS website.
B.08 - SmartMeters™ - Partial Voltage Detection	The phase one technology for single phase meters has been expanded to cover all 4.5 million single phase meters in our service areas, in both HFTD and non-HFTD areas. Phase 2 will implement expanded coverage of Partial Voltage Detection capabilities to the three phase meters by June 30, 2021. These are exploratory technologies that may require refinements and timeline	Firmware rollout after successful completion of regression testing to 415K meters successfully completed on 5/14/21 (against original goal of 365K meters). Filtering/Tuning of alerts completed in DMS and Partial voltage capability for 3 phase meters deployed to production on 6/23/2021 PG&E had initially implemented functionality (alerts from SmartMeters sent to Control Center application to provide locational information on potential

2021 Commitments	WMP Commitment	Summary of 2021 Performance
	commitments are based on best available information at the time of filing.	wires down events) on single phase meters. This project phase addressed the remaining population of SmartMeters (3-phase meters).
B.09 - Sensor IQ Pilot Deployment	PG&E intends to deploy Sensor IQ (SIQ) functionality on all planned SmartMeters™ (500,000) by December 31, 2021.	Meter profile deployment has been completed successfully (Aclara I210 – 158,606 and Focus – 356,839) for a total of 515,445 meters (all meters in HFTD Tiers 2 and 3) with SIQ profiles as of 5/28/2021: • Pipeline to ingest high frequency Sensor IQ data into the Foundry Analytics Platform has completed the SIQ Data Review and validation and is fine-tuning the process to resolve occasional incorrect data coming in from 2% of the meters.
B.10 - Distribution Arcing Fault Signature Library	Complete a 6-month minimum analytic stage capturing all events on the installed circuit (Half Moon Bay 1103) to inform the Distribution Arcing Fault Signature Library project.	Waveform project report delivered from DOE National Labs on 12/10/2021.
B.11 - Enhancements to Fire Potential Index (FPI) Model	Enhance the FPI Model by September 1, 2021 using additional data and an enhanced fire occurrence dataset. PG&E plans to recalibrate the FPI Model using the 2 km climatology with 2020 included. PG&E also plans to incorporate the new Technosylva fuel mapping layer into FPI calculations if it provides more predictive skill of large fires.	This commitment builds upon other WMP commitments that were completed by PG&E meteorology. The end goal was to develop an enhanced FPI using additional model data and testing new model configurations. New FPI machine learning model has been created that includes new data from Technosylva (fuel layer mapping and fuel moisture models). The new model was presented to the Wildfire Risk Governance Steering Committee meeting, who approved the model for operational use on August 1.

APPENDIX A: 2021 WMP COMMITMENTS AND PERFORMANCE (CONTINUED)

2021 Commitments	WMP Commitment	Summary of 2021 Performance
B.12 - Safety and Infrastructure Protection Team (SIPT) Staffing	PG&E will maintain SIPT staffing levels to support fire prevention and mitigation activities. In 2021, the SIPT Program will implement minor technology improvements to the SIPT Viewer to improve data capture for both routine and emergency work. SIPTs will maintain staffing levels to support fire prevention and mitigation activities. Currently, the targeted staffing level equates to 40 crews and 40 engines and associated equipment.	Q4 staffing levels were maintained at a level to meet the SIPT goal of maintaining 40 crews. The SIPT Viewer, did not require enhancements or modifications other than adding new SIPT employee names to the drop-down lists for all work types. GEOTAB continues to support "real-time" awareness of SIPT locations using a standard PG&E technology. We also determined that enhancements to the Fieldworker program were very useful in supporting work management in the Field Safety Reassessment project (clearing vegetation around poles).
B.13 - Enhancements to Outage Producing Wind (OPW) Model	In 2021, PG&E plans to recalibrate the OPW Model using the 2 km climatology that will be extended to capture all events in 2020, including sustained and momentary outages, as well as damages found in PSPS events of 2020.	PG&E data scientists have deployed the new 2021 OPW and IPW models to the PG&E AWS environment and have monitored its operations and output starting in July, meeting the annual target.
B.14 - Wildfire Safety Operations Center (WSOC) - Procedure Update	Update WSOC Procedural Documentation to include expansion of WSOC into the All Hazards Center.	All documentation updates identified for this effort (HAWC SOP, HAWC Notification Process, HAWC Incident Reporting Guidelines and Creation Process, HAWC Evacuation Report Job Aid, HAWC Land Movement Job Aid, HAWC Land Movement Process (captured in the Notification Process document), HAWC PSPS Playbook, HAWC Tech Down Process, HAWC Training Program Manual, and HAWC Fire Simulation Procedure have been completed.). The Daily HAWC process has been finalized to include weather, fires, geosciences, electric and gas operations as well as generation.

APPENDIX A: 2021 WMP COMMITMENTS AND PERFORMANCE (CONTINUED)

2021 Commitments	WMP Commitment	Summary of 2021 Performance
B.15 - Wildfire Safety Operations Center (WSOC) - Expand Active Incidents Visibility	In 2021, PG&E plans to expand the current Active Incidents Dashboard for additional stability, incorporate new data streams, and expand the number of viewers.	The team embarked on an alternative path to increase the Active Incident Dashboard stability and expand the number of users. In Q2, enterprise accounts were set up and existing users were migrated by 6/4. Additional licenses were purchased for up to 1,000 unique users. The team conducted performance testing on 8/4 and implemented a data services quality script on 8/16. On 8/20 the team published an optimized dashboard. They also implemented database monitoring and alerting on 8/20. Weather warnings and Air Quality Index data was added 8/20/21. The availability of the Active Incident Dashboard was initially communicated on 8/23. Follow up communications took place on 9/28. We have increased the number of Active Incident Dashboard (AID) users from 69 on 6/1 to 369 users on 9/30. We will continue to add on additional users upon request
B.16 - HD Cameras	PG&E will install an additional 135 cameras by December 31, 2021, bringing the total number of operational cameras from 333 to 468. The additional wildfire cameras will be installed with viewsheds facing toward Tier 2 & Tier 3 HFTD areas.	By the end of December, PG&E had installed 153 HD Cameras, surpassing the WMP Target of 135 by 18.

APPENDIX A: 2021 WMP COMMITMENTS AND PERFORMANCE (CONTINUED)

2021 Commitments	WMP Commitment	Summary of 2021 Performance
C.01 - Assess Motorized Switch Operator (MSO) switches	PG&E plans to assess various alternatives to address the ignition risk associated with MSO switches. Explore several pilot options to inform the best alternatives and select the appropriate corrective action for MSOs for the next WMP update.	In our November Change Order we proposed updating the MSO pilot by establishing a quantitative target to replace 48 MSO devices by December 31, 2021. As of the end of 2021, 50 MSO devices have been replaced with new SCADA devices: 44 MSOs have been replaced with Reclosers and have been SCADA commissioned, two additional MSOs have been replaced with SCADAMATE-SD switches and have been SCADA commissioned, and 4 MSOs have been replaced that do not require SCADA commissioning.
C.02 - Generation for PSPS Mitigation (Temporary Distribution Microgrids)	Develop at least five additional distribution microgrid Pre-installed Interconnection Hubs (PIH). PG&E will collaborate with county and local government to ensure local priorities help shape site selection and design where technically feasible.	We completed construction for one site (Pollock Pines) in January. Three additional PIH sites (Georgetown, Magalia and Middletown) were completed during Q2. Construction of the Colfax Distribution Microgrid PIH was completed 12/4/21.
C.03 - Generation for PSPS Mitigation (Substation Distribution Microgrids)	Prepare at least eight substations to receive temporary generation for 2021 PSPS mitigation.	The 2021 WMP commitment was to operationalize eight substations by 8/1/2021, the actual count was nine substations operationalized by 9/1/2021, exceeding the WMP commitment by one.
C.04 - Emergency Back-up Generation – PG&E Service Centers & Materials Distribution Centers	By the end of 2021, at least 23 PG&E Service Centers & Materials Distribution Centers will be equipped to receive permanent or temporary generation.	In 2021, this program has exceeded its 2021 WMP commitment to have a total of 23 Service Centers complete by 12/31/21. At the end of 2021, the program now has prepared a total of 37 (5 in 2020 and 32 in 2021) Service Centers with permanent or temporary generation. The WMP 2021 target of 23 service centers, included 5 locations completed in 2020.

2021 Commitments	WMP Commitment	Summary of 2021 Performance
C.05 - Remote Grid	PG&E will begin operations of the first Remote Grid site by the end of 2021. In 2021, PG&E will also continue to mature the Remote Grid concept toward an eventual standard distribution grid configuration. PG&E expects to further validate the availability of viable commercial sourcing agreements via another round of competitive solicitations for Standalone Power Systems (SPS) and supporting services. In addition, PG&E is seeking CPUC approval of a Supplemental Provisions Agreement to extend and clarify how the existing rules and tariffs apply to a customer served by Remote Grid, and to make clear the roles, restrictions, and responsibilities of both PG&E and the customer.	First Remote Grid at Briceburg completed commissioning and went operational on June 3rd. In addition, PG&E; • Completed the second competitive solicitation for Standalone Power System (SPS) and maintenance services, with the released 2021 Request for Proposals (RFP) (5 projects, 7 SPS) bundle, resulting in vender contract awarded on 3 out of 5 projects. • Obtained CPUC approval for Supplemental Provisions and other key program regulatory elements via Resolution E-5132 on March 18, 2021. • Approved site selection criteria within Wildfire Risk Governance Steering Committee project approval framework, for capital project approvals within the System Hardening program • Completed a risk assessment for PG&E's initial Standalone Power System design, involving 11 PG&E staff members and 5 consultant SME's to complete both Failure Modes and Effects Analysis (FMEA) and Hazard Identification processes for an SPS asset design from PG&E's current standard specification.
C.06 - Distribution PSPS Sectionalizing (automated devices)	PG&E plans to install at least 250 more distribution sectionalizing devices integrating learnings from 2020 PSPS events, the 10-year historical look-back of previous severe weather events, and feedback from county leaders and critical customers.	PG&E's WMP commitment was to install and SCADA commission 250 new PSPS Sectionalizing devices. As of December 31, 2021, we had installed and SCADA commissioned 269 new PSPS Sectionalizing devices.

2021 Commitments	WMP Commitment	Summary of 2021 Performance
C.07 - Transmission Switches	PG&E plans to install 29 SCADA transmission switches to provide switching flexibility and sectionalization for PSPS events. All 29 switches are planned for installation by September 1, 2021.	The 2021 WMP goal was to install 29 new T-Line SCADA switches benefitting PSPS operations by 9/1. PG&E installed 29 switches by 9/1, completing this initiative in Q3. In addition, PG&E installed 12 T-Line SCADA switches benefitting PSPS operations after 9/1 for a total of 41 installations in 2021.
C.08 - Distribution line legacy 4C controllers	Replace all remaining (~84) distribution line legacy 4C controllers that are in Tier 2 and Tier 3 HFTD areas.	As of December 31, 2021, we had replaced a total of 81 legacy 4C controllers.[20]
C.09 - Fuse Savers (Single phase reclosers)	PG&E plans to install 70 sets of single phase reclosers in 2021. PG&E is working with the manufacturer to make design improvements to the existing device that allows more universal application of the device within the fire areas.	PG&E's WMP commitment was to install 70 units in 2021. We have completed this commitment by installing 71 units by December 31, 2021.
C.10 - Rapid Earth Fault Current Limiter (REFCL) Pilot	PG&E plans to have the final results from this pilot project by September 2021 to inform the long term REFCL strategy.	The current REFCL pilot project at Calistoga experienced unsuccessful technology integration and implementation to date. We have encountered challenges with successfully implementing the REFCL technology, and reported final results based on this pilot.

[20] In the 2021 WMP, we estimated approximately 84 remaining distribution line legacy 4C controllers located in Tier 2 and Tier 3 HFTD areas. Of these 84 units, 4 were completed in 2020, which resulted in the 2021 target being reduced to 80. A review in Q2 identified that the updated HFRA analysis brought one more location into scope, bringing the total to 81 units in scope for 2021. While this additional unit is not in an HFTD area, it fits with the intent of the program, therefore we are updated our target and recovery plan to 81 units in 2021.

APPENDIX A: 2021 WMP COMMITMENTS AND PERFORMANCE (CONTINUED)

2021 Commitments	WMP Commitment	Summary of 2021 Performance
C.11 - Expulsion Fuse Replacement (non-exempt equipment)	PG&E forecasts replacing approximately 1,200 fuses/cutouts, and other non-exempt equipment identified on poles in Tier 2 and Tier 3 HFTD areas.	The 2021 WMP commitment was to replace 1,200 non-exempt fuses in 2021. As of December 31, 2021, we had replaced 1,429 non-exempt fuses.
C.12 - Surge Arrester Replacements	In 2021, PG&E plans to replace at least 15,000 of the remaining 21,400 Tier 2 and Tier 3 non-exempt surge arresters.	The 2021 WMP commitment was to replace 15,000 non-exempt surge arresters in 2021. As of December 31, 2021, we had replaced 15,465 non-exempt surge arresters.
C.13 - System Hardening (Distribution)	PG&E plans to system harden 180 highest risk miles. As of late January, PG&E is moving aggressively to design and execute the 2021 plan as 60 percent of the planned work is still in first project phase (scoping).	The 2021 WMP commitment was to harden 180 miles in 2021. As of December 31, 2021, PG&E had completed 210.5 miles.
C.14 - Butte County Rebuild	In 2021, the Butte County Rebuild Program target is to underground 23 miles (including both HFTD and non-HFTD areas).	The Butte County Rebuild program completed 23.64 miles of undergrounding in 2021.
C.15 - System Hardening - Transmission Conductor	In 2021, PG&E plans to replace or remove approximately 92 miles of conductor on lines traversing HFTD, including associated asset hardware.	A total of 103.8 miles of system hardening has been completed in 2021.[21]

[21] The miles counted for system hardening in 2021 include a limited number of miles completed at the end of 2020 but have not been previously counted toward system hardening goals and the as-builts were completed in 2021.

APPENDIX A: 2021 WMP COMMITMENTS AND PERFORMANCE (CONTINUED)

2021 Commitments	WMP Commitment	Summary of 2021 Performance
D.01 - Distribution HFTD Inspections (poles)	PG&E to complete enhanced detailed inspections of overhead distribution assets in the following recurrence intervals: (1) Tier 3 – annually; and (2) Tier 2 – every three years. Inspections will be completed by July 31, 2021, barring exceptions due to physical conditions or landholder refusals which delay or hinder PG&E access to facilities.	This commitment involves enhanced detailed inspections of overhead distribution assets in the following recurrence intervals by July 31, 2021: (1) Tier 3 and Zone 1 – annually; and (2) Tier 2 and HFRA – every three years, barring exceptions due to physical conditions or landholder refusals which delay or hinder PG&E access to facilities. This commitment was targeted for completion by July 31, 2021, but PG&E did not complete this commitment by that target date. Although PG&E completed inspections of all assets initially targeted for inspection by July 31, 2021, during record validation, we identified additional poles after July 31, 2021 that should have been inspected. Therefore, as of December 31, 2021, as a result of workplan validation efforts, the target was revised to 480,749 and PG&E has completed enhanced detailed inspections on all 480,749 of these targeted distribution poles.
D.02 - Substation HFTD Inspections (substations)	For 2021, PG&E intends to complete supplemental ground and aerial inspections on all transmission and distribution substations and power generation switchyards in Tier 3 HFTD areas annually and once every three years (~33%) for Tier 2 HFTD areas. PG&E will also inspect substations in areas adjacent to Tier 2 and Tier 3 HFTD areas (i.e., Buffer Zones) once every three years.	PG&E completed its annual Distribution, Transmission and Power Generation targets on July 31, 2021. All Substation HFTD units (Ground, Infrared, and Air+) are 100% completed. There are also 2 Non-HFTD units that are 100% completed. The total for all substations units completed is 142. The full substation enhanced inspections are counted as completed when all three planned inspection types (ground, aerial, and infrared) are completed.

2021 Commitments	WMP Commitment	Summary of 2021 Performance
D.03 - Transmission HFTD Inspections (structures)	PG&E to complete detailed enhanced inspections and some form of aerial assessment (helicopter, drone, aerial lift, climbing) on the following recurrence intervals: (1) Tier 3 – annually; and (2) Tier 2 – every three years. Inspections will be completed by July 31, 2021, barring exceptions due to physical conditions or landholder refusals which delay or hinder PG&E access to facilities. In addition, PG&E intends to complete aerial inspections of 500kV tower structures irrespective of the HFTD location every three years.	This commitment involves enhanced detailed inspections of transmission structures and some form of aerial assessment (helicopter, drone, aerial lift, climbing) on the following recurrence intervals by July 31, 2021: (1) Tier 3 – annually; and (2) Tier 2 and High Fire Risk Areas (HFRA) – every three years barring exceptions due to physical conditions or landholder refusals which delay or hinder PG&E access to facilities. This commitment was targeted for completion by July 31, 2021 and PG&E had completed all structures initially targeted for inspection by that date. However, we identified additional structures after July 31, 2021 that should have been included in the initial inspection. These record validation efforts resulted in an additional 19 structures requiring both ground and aerial inspections in which 18 are in Tier 2 HFTD and 1 in Non-HFTD HFRA areas being added to the 2021 workplan target after the July 31, 2021 due date. As of December 31, 2021, all known HFTD and HFRA transmission structure inspections have been completed.
D.04 - Infrared Inspections of Transmission Electric Lines and Equipment	PG&E plans to conduct infrared inspections on 100% of transmission circuits in Tier 3 HFTD areas, 33% of transmission circuits in Tier 2 HFTD areas, and 20% of transmission circuits in non-HFTD areas plus additional annually inspected lines. The planned scope of Transmission Infrared Inspections in 2021 is approximately 8,000 miles.	The Infrared /Ultra-Violent team have completed their flight scope and working with Asset Strategist through December 31, 2021. There is an approved EDRS Waiver Request for the HFTD 4.02 miles on Grizzly Tap that is de-energized and under construction due to the Dixie Fire. It is scheduled to be in service in 2022. The total information miles completed based on target miles: 1. HFTD YTD miles completed is 4,211.19 with total HFTD target miles of 4,211.19 @ 100% completion. 2. NHFTD YTD miles completed is 3,376.13 with total NHFTD target miles of 3,376.13 @ 100% completion

2021 Commitments	WMP Commitment	Summary of 2021 Performance
		Some infrared inspections were conducted on lines operating at less than 40 percent load capacity because the inspections were scheduled based on historical data on sustained peak line loading, as well as other factors that impact the efficacy of the inspections and the safety of the teams. In some cases, when the inspection occurred, the line was not operating at 40 percent load capacity in real time. Additionally, 73 tap lines (out of 366) were inspected at the same time as their primary lines, and not based on load capacity, because these lines do not transmit loading data to our system.
E.01 - EVM (line miles)	Complete 1,800 circuit miles in HFTD areas	The EVM program completed 1,983 miles in 2021.
E.02 - VM Community and Environmental Engagement	Expansion of the month ahead workplan reports to the Regional Water Quality Control Board (RWQCB) Representatives. Success is defined as: • Provide at least one monthly notification to the RWQCB on availability of reports by end of year; and • Post reports through Project-Wise for RWQCB to review.	PG&E has completed its commitment to post VM work plan look-ahead reports to the RWQCB to review and will continue to utilize Project-Wise to do so. In addition, PG&E provides VM work plan look-ahead reports as well as system-hardening look-ahead reports on a monthly basis to opted-in counties in its service territory. In Q4, PG&E has developed the framework for and begun to execute on its enhanced customer engagement strategy. This new approach incorporates customer outreach through postcards, door hangers, and automated calls to provide up to 5 outreach touchpoints: 2 touchpoints prior to pre-inspections, 2 touchpoints after pre-inspection, and 1 touchpoint post-tree work.

APPENDIX A: 2021 WMP COMMITMENTS AND PERFORMANCE (CONTINUED)

2021 Commitments	WMP Commitment	Summary of 2021 Performance
E.03 - VM Transmission Right of Way (ROW) Expansion	PG&E plans to perform Transmission ROW expansion on approximately 200 miles within HFTD areas.	Transmission ROW expansion completed 288.6 miles in HFTD areas in 2021, of which 217.9 miles are creditable against the 200-mile WMP commitment (*i.e.*, in HTFD areas on or adjacent to planned lines (60/70/115KV)). The remaining non-creditable 70.7 miles in HFTD are primarily on or adjacent to 230KV lines. An additional 25.2 miles are complete in non-HFTD areas.
G.01 - Research Proposals (Open Innovation Challenge)	Initiate an "Open Innovation Challenge" to identify novel technologies that could potentially reduce PG&E-caused wildfire risk.	The final report on this Open Innovation Challenge initiative was filed on September 1, 2021, and the status of the remaining two active finalists will be provided in the 2022 WMP update. Through a series of evaluation and judging rounds in January and February 2021, five finalists were identified out of an initial pool of more than one hundred fifty applicants. After further evaluation and discussion, two finalists remain active.
G.02 - Cal Poly Wildland Urban Interface (WUI) Fire Information Research and Education (FIRE) Institute	In 2021, PG&E is partnering with, and advising on the direction of research and associated activities by, the FIRE Institute.	The institute has been formally approved and operationalized. PG&E has provided its part of the initial funding of the institute. The initial online introductory seminar was held in December. In addition, PG&E, Southern California Edison Company (SCE), and San Diego Gas & Electric Company (SDG&E) continued to meet with the Cal Poly faculty to further define the initial potential joint-funded Institute research proposals.
I.01 - Staffing to Support Service Restoration	Hire staffing level of approximately 40 Linemen and 100 Apprentices.	As of December 31, 2021, we have hired: • 41 Lineman - 1 above target; and • 123 Apprentice - 23 above target

APPENDIX A: 2021 WMP COMMITMENTS AND PERFORMANCE (CONTINUED)

2021 Commitments	WMP Commitment	Summary of 2021 Performance
I.02 - Trained Workforce for Service Restoration	In 2021, all required personnel must complete identified trainings to improve PSPS event execution (including SEMS, Access and Functional Needs and other critical training).	This commitment includes five activities with specific milestone dates for each activity. The first of these five activities were not completed by the target date: to complete Phase III SEMS training (ICS 300/400) for all Command staff and select roles in General staff by June 30, 2021. However, as of November 17, 2021, all required EOC staff have completed this training. We note that this does not include new team members who assume a Command & General Staff position due to unexpected vacancies on an EOC duty team. The remaining four activities were all completed on or before the target date.
J.01 - Community Based Organizations (CBOs) Coordination	Partner with CBOs in targeted communities to increase their capacity to serve AFN communities, such as medically sensitive customers, low-income, limited- English speaking and tribal customers.	PG&E completed a gap analysis to inform our 2021 CBO partnership strategy to target CBOs that will fill resource needs in communities impacted by PSPS in 2018-2020, with a goal of 10 new partnerships in 2021. PG&E continues to engage with CBOs to understand the impacts of PSPS events on the AFN community and look for opportunities to leverage a partnership. PG&E has engaged with 70 new CBOs and has established 40 new informational CBO partnerships and 18 new resource partnerships with CBOs. PG&E has established an agreement with California network of 211s to provide customers in the AFN community with a single source of information and connection to available resources in their communities. PG&E has been processing scope of works that allow for extending agreements through end-of-year 2024. CBOs that have agreed to extension of partnerships, may be able to provide services for non-PSPS related outages when requested by PG&E to do so.

APPENDIX A: 2021 WMP COMMITMENTS AND PERFORMANCE (CONTINUED)

2021 Commitments	WMP Commitment	Summary of 2021 Performance
J.02 - Community Engagement	Engage community stakeholders through offering: Wildfire Safety Working Sessions, workshops that review PG&E's PSPS Policies and Procedures document, listening sessions, and Energy and Communications Providers Coordination Group meetings.	PG&E completed five Regional Working Groups in March 2021. In May, PG&E conducted direct to customer outreach including telecommunication providers providing PSPS mitigation and planning data. In June, PG&E hosted four Wildfire Safety Working Sessions (WSWS). In June, PG&E hosted nine meetings that as part of the agenda discussed the 2021 PSPS Policies and Procedures document. The 2021 PSPS Policies and Procedures document has been finalized and published as of June. PG&E held 3 TelCo Resiliency Workshops and 1 PSPS readiness webinar with Telcos. The final TelCo Resiliency Collaborative meeting of 2021 was held in December.
J.03 - Customer and Community Outreach	Continue to enhance communications and engagement efforts with a focus on wildfire safety and preparedness for PSPS events - including Webinars/Community Meetings, Direct-to-Customer Outreach, developing and delivering informational video resources.	Total webinar/safety town halls completed in 2021: 39. Total mailings in 2021: 87. Total number of videos completed in 2021: 4.
K.01 Customer and Agency Outreach During PSPS Events	Improve Customer and Agency Outreach During PSPS Events by: developing opt-in address alerts, conducting new message	Address Alert enrollment YTD is 82,475. Promotion of Self Certified Vulnerable during Reginal webinars and as part of MBL messaging, 29,846 YTD new Self Certified Vulnerable enrollments in 2021,

2021 Commitments	WMP Commitment	Summary of 2021 Performance
	testing, promoting enrollment, hosting briefings, and hosting cooperator calls.	37,316 YTD new language preference updates in 2021.
K.02 Mitigate Impacts on De-Energized Customers 8.2.1	Work with partner organizations to provide outreach and support to vulnerable customers through programs such as the Disability Disaster Access and Resources Program (DDAR) and the Portable Battery Program (PBP).	Portable Battery Program and CFILC-DDAR: We have exceeded the year-end 5,000 battery delivery goal by ~30%, providing 6,482 portable batteries in 2021 to low-income Medical Baseline customers and customers with disabilities who reside in HFTDs or have experienced 2+ PSPS events. That brings the total of number of batteries delivered for 2020-21 years of the programs to 13,055 exceeding the 11,500 goal by over 13%. Year to date, 92% of eligible and interested customers received at least one service offered, which exceeds the target of 90%. In Q4, CFILC's Disability Disaster Access & Resources program provided the following resources during PSPS events: 25 hotel stays, 26 food vouchers, 1 transit ride, 3 gas cards, and responded to 18 MBL escalations through the EOC Situation Room. Self-Generation Incentive Program: We have paid out a total of 2,112 Equity Resiliency projects exceeding the forecast of 2,100 for year end. There are currently 65 applications on the waitlist and over 3,000 applications in process. For General Market, we have paid out over 4,100 projects in 2021 alone. There are currently 90 applications on the Equity waitlist and over 6,300 applications in process. In Q4, we opened the Step 7 budget for General Market after exhausting the Step 6 budget. Generator and Battery Rebate Program: Since expanding the program in June 2021, we have paid out 1,223 projects, exceeding original target of 700. In Q3 and Q4, we have also successfully partnered with the SmartMeter team to launch the Backup Power Transfer Meter pilot, where we designed and implemented a pilot to install 50 internally developed transfer switch

2021 Commitments	WMP Commitment	Summary of 2021 Performance
		devices free of charge to customers who participated in the Generator and Battery Rebate Program with compatible generators.