



2020 California Wildfire Mitigation Plan

PacifiCorp

Implementing Requirements of Senate Bill 901 and Rulemaking 18-10-007

February 7, 2020

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Glossary of Defined Terms

Term	Definition
10-hour dead fuel moisture content	Moisture content of small dead vegetation (e.g. grass, leaves, which burn quickly but not intensely), which can respond to changes in atmospheric moisture content within 10 hours.
Access and functional needs populations	Per Government Code § 8593.3 and D.19-05-042, individuals who have developmental or intellectual disabilities, physical disabilities, chronic conditions, injuries, limited English proficiency or who are non-English speaking, older adults, children, people living in institutionalized settings, or those who are low income, homeless, or transportation disadvantaged, including, but not limited to, those who are dependent on public transit or those who are pregnant.
Authority Having Jurisdiction	AHJ, party with assigned responsibility, depending on location and circumstance.
Asset (utility)	Electric lines, equipment, or supporting hardware.
At-risk species	Species of vegetation that are particularly likely to contact power lines in the event of high winds and/or ignite if they catch a spark.
Baseline (ignition probability, maturity)	A measure, typically of the current state, to establish a starting point for comparison.
Carbon dioxide equivalent	Tons of greenhouse gases (GHG) emitted, multiplied by the global warming potential relative to carbon dioxide.
Contractor	Any individual in the temporary and/or indirect employ of the utility whose limited hours and/or time-bound term of employment are not considered as “full-time” for tax and/or any other purposes.
Critical facilities and infrastructure	In accordance with the interim definition adopted in D.19-05-042, those facilities and infrastructure that are essential to the public safety and that require additional assistance and advance planning to ensure resiliency during de energization events, namely: emergency services sector (police stations, fire stations, emergency operations centers), government facilities sector (schools, jails, prisons), healthcare and public health sector (public health departments, medical facilities, including hospitals, skilled nursing facilities, nursing homes, blood banks, health care facilities, dialysis centers and hospice facilities), energy sector (public and private utility facilities vital to maintaining or restoring normal service, including, but not limited to, interconnected publicly owned utilities and electric cooperatives), water and wastewater systems sector (facilities associated with the provision of drinking water or processing of wastewater including facilities used to pump, divert, transport, store, treat and deliver water or wastewater), communications sector (communication carrier infrastructure including selective routers, central offices, head ends, cellular switches, remote terminals and cellular sites), and chemical sector (facilities associated with the provision of manufacturing, maintaining, or distributing hazardous materials and chemicals).
Customer hours	Total number of customers, multiplied by the average number of hours (e.g. of power outage).
Data cleaning	Calibrating raw data to remove errors (including typographical and numerical mistakes).
Dead fuel moisture content	Moisture content of dead vegetation, which responds solely to current environmental conditions and is critical in determining fire potential.

Term	Definition
Detailed inspection	In accordance with GO 165, an inspection where individual pieces of equipment and structures are carefully examined, visually and through use of routine diagnostic test, as appropriate, and (if practical and if useful information can be so gathered) opened, and the condition of each rated and recorded.
Enhanced inspection	Inspection whose frequency and thoroughness exceeds the requirements of the detailed inspection, particularly if driven by risk calculations.
Evacuation impact	Number of people evacuated, with the duration for which they are evacuated, from homes and businesses, due to wildfires.
Evacuation zone	Areas designated by CALFIRE and IoCALFIRE agency evacuation orders, to include both “voluntary” and “mandatory” in addition to other orders such as “precautionary” and “immediate threat”.
Fuel density	Mass of fuel (vegetation) per area which could combust in a wildfire.
Fuel management	Removing or thinning vegetation to reduce the potential rate of propagation or intensity of wildfires.
Fuel moisture content	Amount of moisture in a given mass of fuel (vegetation), measured as a percentage of its dry weight.
Full-time employee	Any individual in the ongoing and/or direct employ of the utility whose hours and/or term of employment are considered as “full-time” for tax and/or any other purposes.
GO 95 nonconformance	Condition of a utility asset that does not meet standards established by General Order 95.
Greenhouse gas (GHG) emissions	Health and Safety Code 38505 identifies seven greenhouse gases that ARB is responsible to monitor and regulate in order to reduce emissions: carbon dioxide (CO ₂), methane (CH ₄), nitrous oxide (N ₂ O), sulfur hexafluoride (SF ₆), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and nitrogen trifluoride (NF ₃).
Grid hardening	Actions (such as equipment upgrades, maintenance, and planning for more resilient infrastructure) taken in response to the risk of undesirable events (such as outages) or undesirable conditions of the electrical system in order to reduce or mitigate those events and conditions, informed by an assessment of the relevant risk drivers or factors.
Grid topology	General design of an electric grid, whether looped or radial, with consequences for reliability and ability to support de-energization (e.g., being able to deliver electricity from an additional source).
High Fire Threat District (HFTD)	Per D.17-01-009, areas of the State designated by the CPUC and CALFIRE to have elevated wildfire risk, indicating where utilities must take additional action (per GO 95, GO 165, and GO 166) to mitigate wildfire risk.
Highly rural region	In accordance with 38 CFR 17.701, “highly rural” shall be defined as those areas with a population of less than 7 persons per square mile.
Ignition probability	The relative possibility that an ignition will occur, probability is quantified as a number between 0% and 100% (where 0% indicates impossibility and 100% indicates certainty). The higher the probability of an event, the more certainty there is that the event will occur. (Often informally referred to as likelihood or chance).
Ignition-related deficiency	Any condition which may result in ignition or has previously resulted in ignition, even if not during the past five years.

Term	Definition
Impact/consequence of ignitions	The effect or outcome of a wildfire ignition, affecting objectives, which may be expressed by terms including, although not limited to health, safety, reliability, economic and/or environmental damage.
Initiative	Measure or activity proposed or in process designed to reduce the consequences and/or probability of wildfire or PSPS.
Inspection protocol	Documented procedures to be followed in order to validate that a piece of equipment is in good condition and expected to operate safely and effectively.
Invasive species	Non-native species whose proliferation increases the risk of wildfires.
Level 1 finding	In accordance with GO 95, an immediate safety and/or reliability risk with high probability for significant impact.
Level 2 finding	In accordance with GO 95, a variable (non-immediate high to low) safety and/or reliability risk.
Level 3 finding	In accordance with GO 95, an acceptable safety and/or reliability risk.
Life expectancy	Anticipated years that a piece of equipment can be expected to meet safety and performance requirements.
Limited English Proficiency (LEP)	Populations with limited English working proficiency based on the International Language Roundtable scale.
Live fuel moisture Content	Moisture content within living vegetation, which can retain water longer than dead fuel.
Lost energy	Energy that would have been delivered were it not for an outage.
Major roads	Interstate highways, U.S. highways, state and county routes.
Match drop simulation	Wildfire simulation method that takes an arbitrary ignition and forecasts propagation and consequence/impact.
Member of the public	Any individual not employed by the utility.
Multi-attribute value function	Risk calculation methodology introduced during CPUC's S-MAP and RAMP proceedings.
Near miss	An event with significant probability of ignition, including wires down, contacts with objects, line slap, events with evidence of significant heat generation, and other events that cause sparking or have the potential to cause ignition.
Near-miss simulation	Simulation of what the consequence would have been of an ignition had it occurred.
Need for PSPS	When utilities' criteria for utilizing PSPS are met.
Noncompliant clearance	Rights-of-way whose vegetation is not trimmed in accordance with the requirements of GO 95.
Outages of the type that could ignite a wildfire	Outages that, in the judgement of the utility, could have ignited a wildfire.

Term	Definition
Outcome metrics	Measurements of the performance of the utility and its service territory in terms of both leading and lagging indicators of wildfire, PSPS, and other consequences of wildfire risk, including the potential unintended consequences of wildfire mitigation work, such as acreage burned by utility-ignited wildfire.
Overcapacity	When the energy transmitted by utility equipment exceeds that of its nameplate capacity.
Patrol inspection	In accordance with GO 165, a simple visual inspection of applicable utility equipment and structures that is designed to identify obvious structural problems and hazards. Patrol inspections may be carried out in the course of other company business.
Percentile conditions	Top X% of a particular set (e.g. wind speed), based on a historical data set with sufficient detail.
Planned outage	Electric outage announced ahead of time by the utility.
Preventive maintenance (PM)	The practice of maintaining equipment on a regular schedule, based on risk, elapsed time, run-time meter readings, or number of operations. The intent of PM is to “prevent” maintenance problems or failures before they take place by following routine and comprehensive maintenance procedures. The goal is to achieve fewer, shorter, and more predictable outages.
Priority essential services	Critical first responders, public safety partners, critical facilities and infrastructure, operators of telecommunications infrastructure, and water utilities/agencies.
Program targets	Measurements of activity identified in WMPs and subsequent annual updates, in terms of volume or scope of work, such as number trees trimmed or miles of power lines hardened.
Progress metrics	Measurements that track how much utility wildfire mitigation activity has changed the conditions of utility wildfire risk exposure or utility ability to manage wildfire risk exposure, in terms of leading indicators of ignition probability and wildfire consequences.
Property	Private and public property, buildings and structures, infrastructure, and other items of value that were destroyed by wildfire, including both third-party property and utility assets.
PSPS risk	The potential for the occurrence of a PSPS event expressed in terms of a combination of various outcomes of the event and their associated probabilities.
PSPS weather	Weather that exceeds a utility's risk threshold for initiating a PSPS.
Red Flag Warning	RFW, level of wildfire risk from weather as declared by the National Weather Service.

Term	Definition
RFW Circuit Mile Day	Sum of miles of utility grid subject to Red Flag Warning each day. For example, if 100 circuit miles were under a RFW for 1 day, and 10 of those miles were under RFW for an additional day, then the total RFW circuit mile days would be 110. To calculate a Red Flag Warning (RFW) day, hours of a RFW shall be converted to fractions of a day by dividing by 24. For example, if a period of 12 days saw 1 hour of RFW each day, then the number of RFW days would be $12 * 1 \text{ hour} / 24 \text{ hours} = 0.5 \text{ RFW days}$. The reporting unit RFW circuit mile days takes into account the geographic scope of the RFW by multiplying its duration by the number of circuit miles within the scope of the RFW during the given time. ¹
Risk map²	A collection of data sufficient to represent the spatial distribution (e.g., across a geography) of a given type of risk (i.e., the probability of an event and its consequence) and the spatial representation thereof. Data inputs shall include the variables and conditions used to calculate risk for a given point, line, or polygon.
Risk mapping algorithm³	A risk mapping algorithm is a methodology for calculating risk levels from data inputs across a spatial display (i.e., map of geography).
Risk-spend efficiency	An estimate of the cost-effectiveness of initiatives, calculated by dividing the mitigation risk reduction benefit by the mitigation cost estimate based on the full set of risk reduction benefits estimated from the incurred costs.
Rule	Section of public utility code requiring a particular activity or establishing a particular threshold.
Run-to-failure	A maintenance approach that replaces equipment only when it fails.
Rural region	In accordance with GO 165, "rural" shall be defined as those areas with a population of less than 1,000 persons per square mile as determined by the United States Bureau of the Census.
Safety Hazard	A condition that poses a significant threat to human life or property.
Simulated wildfire	Propagation and impact/consequence of a wildfire ignited at a particular point ('match drop'), as simulated by fire spread software.
Span	The space between adjacent supporting poles or structures on a circuit consisting of electric line and equipment. "Span level" refers to asset-scale granularity.
System Average Interruption Duration Index (SAIDI)	System-wide total number of minutes per year of sustained outage per customer served.
Third-party contact	Contact between a piece of electrical equipment and another object, whether natural (tree branch) or human (vehicle).
Time to expected failure	Time remaining on the life expectancy of a piece of equipment.

¹ Definition amended per WMP Clarification Document from 11/15/2020 at page 11.

² Added per WMP Clarification Document from 11/15/2020 at page 11.

³ Added per WMP Clarification Document from 11/15/2020 at page 11.

Term	Definition
Top 30% of proprietary fire potential index	Top 30% of FPI or equivalent scale (e.g., “Extreme” on SCE’s FPI; “extreme”, 15 or greater, on SDG&E’s FPI; and 4 or above on PG&E’s FPI).
Trees with strike potential / hazard trees	Trees that could either 'fall in' to a power line, or have branches detach and 'fly in' to contact a power line in high-wind conditions.
Unplanned outage	Electric outage that occurs with no advance notice from the utility (e.g. blackout).
Urban region	In accordance with GO 165, "urban" shall be defined as those areas with a population of more than 1,000 persons per square mile as determined by the United States Bureau of the Census.
Utility-ignited wildfire	Wildfires ignited by utility infrastructure or employees, including all wildfires determined by AHJ investigation to originate from ignition caused by utility infrastructure.
Vegetation management	Trimming and clearance of trees, branches, and other vegetation that poses the risk of contact with electric equipment.
Vegetation risk index	Risk index indicating the probability of vegetation-related outages along a particular circuit, based on the vegetation species, density, height, and growth rate.
Weather normalization	Adjusting metrics based on relative weather risk, with RFW circuit mile days as the normalization factor.
Wildfire impact/consequence	The effect or outcome of a wildfire affecting objectives, which may be expressed, by terms including, although not limited to health, safety, reliability, economic and/or environmental damage.
Wildfire risk	The potential for the occurrence of a wildfire event expressed in terms of a combination of various outcomes of the wildfire and their associated probabilities.
Wildfire-only WMP programs	Activities, practices, and strategies that are only necessitated by wildfire risk, unrelated to or beyond that required by minimum reliability and/or safety requirements. Such programs are not indicated or in common use in areas where wildfire risk is minimal (e.g., territory with no vegetation or fuel) or under
Wildland urban interface (WUI)	A geographical area identified by the state as a “Fire Hazard Severity Zone”, or other areas designated by the enforcing agency to be a significant risk from wildfires, established pursuant to Title 24, Part 2, Chapter 7A.
Wire down	Instance where an electric transmission or distribution conductor is broken and falls from its intended position to rest on the ground or a foreign object.

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Executive Summary

Wildfire has long been an issue of notable public concern, especially for electric utilities that have always needed to mitigate the potential for a wildfire sparked by an electric facility. As discussed below, the California Public Utilities Commission (CPUC or Commission) has worked to address the specific risks created by operation of an electric grid with targeted regulations and programs since at least 2007. PacifiCorp, in California d/b/a PacifiCorp, has been an active participant in these proceedings. However, decades of trends in the growth of wildfire frequency, size and intensity have magnified these concerns and necessitated a more intensive prevention and response paradigm. At the same time, increasing and widespread human development in the wildland-urban interface has increased the areas where people (and their residences) are intermixed with, or located near, substantial wildland vegetation. This has exacerbated the costs of wildfire damage in terms of both property damage and loss of human life. The November 2018 Camp Fire presents a devastating recent example; this fire decimated the city of Paradise and resulted in the death of 87 people.

The CPUC first initiated a decade-long fire safety rulemaking that began in 2008. The first phase of this rulemaking focused on immediate measures in the highest fire risk area, in southern California. Thereafter rules of a longer implementation time were developed that would reduce the risk of fire ignition caused by overhead utility systems. These rules culminated at approximately the same time the state was experiencing widespread drought, and the company was directed to identify and implement actions, including these new rules, to address wildfire risks on its systems. As result a Fire Prevention Plan and a Drought Mitigation Plan were prepared and implemented starting in 2014. In early 2018 as the multiple phase rulemaking concluded, the state of California experienced catastrophic wildfires in both northern and southern California making clear that these efforts needed to be augmented.

In response to Senate Bill (SB) 901,⁴ California took a comprehensive approach to mitigating wildfires while also working to create a more resilient electric grid. A key element of SB 901 is the requirement for all electric utilities to develop and implement Wildfire Mitigation Plans (WMPs). These WMPs were first filed and approved in 2019; this 2020 WMP builds on the company's 2019 WMP and includes the additional information requested by the Commission pursuant to its updated WMP filing templates. This WMP represents another incremental step towards mitigation of these wildfire risks in the state of California.

The first WMPs were developed and filed in the Commission's rulemaking docketed as R.18-10-007. Following approval of the 2019 WMPs, the Commission has continued to engage with stakeholders, including the utilities, to improve and refine the WMP process. As a result of this stakeholder engagement, the 2020 WMP includes an increase in robust data that is intended to allow the Commission and stakeholders to review each utility's progress in mitigating wildfire risk and hardening their systems. While all major initiatives require a ramp-up period, PacifiCorp has made strides during the first year of its WMP implementation and has intended to capture its successes and lessons learned in this filing. Among other things, the 2020 WMPs are designed to continue collecting baseline data to evaluate progress on a going forward basis. While PacifiCorp is unable to provide five years of historic data for all of the metrics included in this report, the company has and will continue to improve upon its data collection as implementation of wildfire mitigation measures continue.

⁴ SB 901 was signed into law by the Governor of California in September 2018.

The company also notes that as a small, multi-jurisdictional utility it was not subject to the Safety Model and Assessment Proceeding (S-MAP) and Risk Assessment Mitigation Phase (RAMP) requirements that are applicable to the three large investor owned utilities. These requirements were adopted by the Commission as part of rulemaking R.13-11-006. PacifiCorp (and the other small and multi-jurisdictional utilities) were respondents to that rulemaking; however, the Commission determined that the risk-based decision making requirements adopted for California's three largest electric utilities should not initially apply to smaller utilities, including PacifiCorp, because it would not be practical or appropriate to apply the same processes to these much smaller entities. Instead, the CPUC required the small and multi-jurisdictional utilities to begin incorporating risk-based decision making into their General Rate Case (GRC) filings.

Starting in 2018, PacifiCorp leveraged lessons learned from other utilities, previous risk and health assessment methodologies and principles of the International Standardization Organization's "Risk Management – Principles and Guidelines"⁵ to develop the company's first risk based decision-making framework, which was subsequently included in PacifiCorp's 2018 GRC filing. This methodology included an assessment of the company's top categorical risks including, but not limited to, substation transformer failure, substation circuit breaker failure, overhead distribution conductor failure, and relay mis-operation.

While PacifiCorp remains fully committed to the continued development and improvement of the company's risk based decision making framework, the company is not, however, subject to the S-MAP and RAMP requirements in the same way or on the same timeline. Therefore many of the elements requested by the Commission in this 2020 WMP filing may not be applicable to PacifiCorp, specifically elements related to risk reduction, resource allocation methodology, and risk-spend efficiency calculation. To the extent that a program addresses a top categorical risk included in the company's GRC filing, PacifiCorp was able to qualify relative risk ranking but cannot provide the discreet calculations as requested. At the guidance of the WSD,⁶ these elements are marked "does not apply," "not applicable," or "N/A" throughout this WMP. In addition, the company has not experienced any Public Safety Power Shutoff ("PSPS") events on its system; as a result, the company does not have any data of its own on which to base improvements or implementation changes. Instead, PacifiCorp has monitored the PSPS events experienced by other utilities and incorporated lessons learned into its own procedures and plans (*e.g.*, lessons learned regarding customer communications and coordination with public safety officials).

The company's WMP is intended to guide PacifiCorp's efforts to minimize the risks of a fire igniting from any of the company's facilities. The WMP also addresses the response to an active wildfire (whether ignited by the company's facilities or otherwise) to minimize the potential for damage to PacifiCorp's facilities and its customers. As set forth in greater detail in Section 5 of this WMP, the company has leveraged lessons learned from its experience and the experience of other utilities, guidance from the Commission's initiatives, and engineering and operational best practices to create its general approach to managing wildfire risk. This experience includes its years of experience implementing safety and reliability

⁵ International Standardization Organization's Risk Management-Principles and Guidelines are identified as ISO 3100 and is an internationally recognized standard for risk management. Adopting these principles and guidelines positions an organization to be able to achieve objectives, improve the identification of risks, and more effectively allocate resources for risk reduction

⁶ Clarified in an email from Melissa K. Semcer, Program Manager Wildfire Safety Division at the California Public Utilities Commission on January 6, 2019.

risk mitigation programs. As a result, many of the initiatives and programs identified in this plan are an extension or augmentation of scope for its already existing programs (*e.g.*, the company's vegetation maintenance inspection and correction programs). This experience was also leveraged together with historical data when new programs or activities were necessary (*e.g.*, installation of covered conductor).

Historic data used by the company to design its WMP initiatives and programs was obtained from CALFIRE data sources in addition to the company's own outage records; PacifiCorp's outage records include the frequency, duration, and cause of outages experienced on energized circuits. These outage records are used to describe ignition probability drivers and represent the most accurate depiction of how often potential ignition events may occur within the company's service territory. During 2019, the first year of its WMP implementation, PacifiCorp was able to materially implement the plan despite the constraints of start-up efforts and available resources. Section 5.0 of this plan provides additional detail regarding the company's progress; key successes during 2019 include the formation of a Wildfire Mitigation Program Office, increased staffing of a data scientist, installation of 10 weather stations for enhanced situational awareness, completion of 10 system automation projects for advanced fault detection and coordination, full implementation of HFTD inspection and correction requirements, partial completion of various inspection related pilot projects, as well as other efforts summarized in Section 2.5.

The 2020 WMP builds on these successes, as described above; in Section 5 of this plan the company sets forth its objectives for the next year and the next three years. Key objectives for 2020 include installation of 38 line miles of covered conductor, installation and commissioning of 31 system automation programs, replacement of 3 line miles of small diameter copper conductor with aluminum stranded conductor, proactive replacement of 189 in-service wooden poles with fiberglass for enhanced structural resilience, as well as evaluation of various pilot project results and continued implementation of enhanced inspection and correction programs. The company expects that the first three to five years of WMP implementation will be critical in terms of establishing data records to evaluate its progress. With the creation of the 2020 WMP and related data collection, the company has made significant progress in creating and providing a baseline of data to measure its incremental changes in these programs and initiatives. WSD has also been working collaboratively with the utilities and other stakeholders to ensure that data collected is as uniform as possible in order to allow comparisons and also that the data collected is useful for evaluation purposes.

1. Persons Responsible for Executing the WMP

Provide an accounting of the responsibilities of the responsible person(s) executing the plan, including:

1. Executive level with overall responsibility

Program	Responsible Role/Person
PacifiCorp's 2020 Wildfire Mitigation Plan	Vice President, T&D Operations

2. Program owners specific to each component of the plan

The following table include the high level wildfire mitigation programs addressed in PacifiCorp's 2020 WMP, as well as identified responsible owners to deliver the programs. While each program may have various contributors for each specific initiative, PacifiCorp has assigned specific responsibility at the program level to one person.

Program	Responsible Role/Person
Risk Assessment and mapping	Director of Asset Performance and Wildfire Mitigation, T&D Operations
Situational Awareness and forecasting	Director of Asset Performance and Wildfire Mitigation, T&D Operations
Grid Design and system hardening	Wildfire Mitigation Delivery Director, T&D Operations
Asset Management and inspections	Director of Asset Management, T&D Operations
Vegetation management and inspections	Director of Environmental & Vegetation Management, T&D Operations
Grid operations and protocols	Vice President of System Operations, T&D Systems Operations
Data Governance	Director of Asset Performance and Wildfire Mitigation, T&D Operations
Resource allocation methodology	Director of Asset Management, T&D Operations
Emergency planning and preparedness	Disaster/Risk Planning Manager, T&D Systems Operations
Stakeholder cooperation and community engagement	Director of Commercial Accounts and Community Relations, External Affairs and Customer Solutions

1.1 Verification

Complete the following verification for the WMP submission:

(See Rule 1.11)
(Where Applicant is a Corporation)

I am an officer of the applicant corporation herein, and am authorized to make this verification on its behalf. The statements in the foregoing document are true of my own knowledge, except as to matters which are therein stated on information or belief, and as to those matters I believe them to be true.

I declare under penalty of perjury that the foregoing is true and correct.

Executed on 2/5/2020 at Portland, ~~California.~~ Oregon
(Date) (Name of city)

Daniel Lucas, VP, T+D Operations
(Signature and Title of Corporate Officer)

2. Metrics and Underlying Data

The following subsections include PacifiCorp's performance report on progress and outcome metrics within the utility's service territory over the past five years. In most cases, PacifiCorp was able to pull data and populate the tables as the requirements were consistent with business practices or readily available data sets. However, many of the proposed metrics or reporting requirements included in this section proved challenging for PacifiCorp to populate, specifically retroactive values regarding programs that were initiated in 2019. For example, PacifiCorp incorporated specific documentation requirements into current inspection and correction programs in 2019 to reflect changing regulations. These new requirements specifically facilitate the clear identification of findings that could increase the probability of ignition as a result of inspections. Item 2.a. of Table 2 in Section 2.3 requests that PacifiCorp include the number of equivalent Level 1 findings that could increase the probability of ignition discovered per circuit mile inspected for the years 2015 through 2019. While PacifiCorp is able to clearly identify values for 2019, extrapolation was required to populate equivalent values for the years 2015 through 2018 prior to changes in regulation and subsequent amendments to PacifiCorp's documentation processes. Additionally, PacifiCorp's GIS data generally reflects the data set required to operate the system, not necessarily track asset or ancillary features and, therefore, certain data sets were not available in the manner requested. Notes are provided throughout the document where assumptions or extrapolation was required to fit PacifiCorp's available data into the specific set of requirements.

PacifiCorp understands the value of and is committed to tracking and trending metrics over time to inform decision making, effectiveness, and overall progress of programs and looks forward to continuing to capture and report data in an effective and consistent manner.

2.1 Lessons learned: How tracking metrics on the 2019 plan has informed the 2020 plan

Data and metrics captured regarding the 2019 plan or included in this section of PacifiCorp's 2020 WMP were used to inform continued progress in the implementation of the company's wildfire mitigation programs. Historic data was also used to develop the company's risk assessment and mapping which informed program development included in Section 3.0. However, PacifiCorp is early in the implementation of its multi-year WMP and, therefore, tracking metrics has not yet resulted in significant changes, lessons learned, or amendments to programs. A discussion of high level lessons learned was included in Section 5.0. These lessons learned were more operations based lessons learned and less informed through tracking 2019 metrics. Furthermore, as included in PacifiCorp's Off-Ramp filing Advice Letter filed on November 27, 2019 pursuant to Decision 19-05-036, "there are no components of the WMP currently recommended to be suspended, eliminated, or minimized within its plan due to concerns regarding effectiveness."

However, as PacifiCorp's implementation of its multi-year WMP progresses with associated tracking of metrics, the company expects that this data will become more influential and impactful to components, initiatives, or programs as a whole; PacifiCorp expects the most value will occur after the first three year period of implementation. General lessons learned through program implementation were included in Section 5.0

2.2 Recent performance on progress metrics, last 5 years

The following table includes PacifiCorp's recent performance on progress metrics over the last 5 years. As PacifiCorp's WMP and associated programs were developed in 2019, all data reported prior to 2019 represents the company's interpretation of historic data in light of current programs, risk mapping, and circuit topography.

When reviewing this data, as well as any other data included in this plan, it is critical to understand that PacifiCorp identifies, tracks, and reports inspection based on facilities⁷ as opposed to line miles. When an inspector completes an inspection of a facility, the inspection includes all assets at that facility location, as well as any applicable and adjacent line miles. This method allows PacifiCorp to level load resources and distribute work as evenly as practical across each year where appropriate. While a strong correlation can be made between number of facilities and line-miles when discussing inspections, it is expected that the number of equivalent line-miles inspected in any given year will vary, often significantly, as the number of facilities to be inspected vary each year and not all spans are the same length across the entire system. Additionally, as is expected with multi-year inspection programs, the actual topology and system inspected will significantly change from year to year, to include variations in voltage, type of installation, span length, geographic location, and environmental conditions. Therefore, PacifiCorp cautions against drawing any meaningful conclusions regarding annual trends when reviewing inspection and correction metrics as included in the document. Instead, PacifiCorp recommends using the full data set provided to calculate qualitative multi-year averages, identify the relative range of values that can be expected, and understand qualitative relative order of magnitude for comparison to other utilities.

Table 1: Recent performance on progress metrics, last 5 years

#	Progress metric name	Inspection Type	Annual Performance					Unit(s)	Comments
			2015	2016	2017	2018	2019		
1.a.	Grid condition ⁸ findings per mile of HFTD	Patrol	0.01	0.02	0.04	0.06	0.04	Findings per mile of circuit in HFTD	PacifiCorp implemented its HFTD mapping as well as fire threat condition programs 2019. Therefore, grid condition findings per HFTD were available in 2019. PacifiCorp has included the number of grid condition findings for 2015-2018 assuming that the HFTD zones are equivalent to those in 2019/2020. Additionally, PacifiCorp plans, tracks, and reports inspections and corrections per facility point as opposed to per line mile. However, equivalent inspection miles
		Detailed	9	14	15	9	7		
		Other	0.03	0.02	0.06	0.02	0.01		

⁷ "Facilities" refers to a location where PacifiCorp has one or more assets installed. Usually, this would mean a pole or structure but could also be pad-mounted switchgear, a substation, or a switching station. These facilities were included in the GIS data requested in Section 2.7.

⁸ PacifiCorp interprets and defines grid condition finding as an actionable Condition with an assigned Condition Code as defined and described in Section 5.3.4.

#	Progress metric name	Inspection Type	Annual Performance					Unit(s)	Comments
			2015	2016	2017	2018	2019		
1.b.	Grid condition findings per total miles	Patrol	0.11	0.14	0.05	0.17	0.11	Findings per total miles of circuit	were extrapolated in years 2015-2019 assuming little to no changes in grid topology. While these values reflect best estimates or equivalent line-miles, slight difference may exist when comparing to other data sets. Furthermore, the evolution of PacifiCorp's electronic database requires extrapolation when determining condition findings per inspection type. However, PacifiCorp's programmatic inspection results were generally extrapolated and categorized as either "Detailed" or "Safety" inspection results. "Other" inspection types might include the results of internal audits or administrative changes described in Section 5.3.4.14.
		Detailed	13	17	14	12	16		
		Other	0.05	0.05	0.04	0.03	0.02		
2	Vegetation clearance findings from inspection		-	-	-	-	-	Percent of right of way with noncompliant clearance based on application rules and regulations at the time of inspection, as percentage of all right of way inspected	While PacifiCorp's programs include clearance inspections and correction of findings, the company does not currently have an electronic database that preserves the data in a way required to answer this question. However, PacifiCorp has incorporated the need for an electronic solution into a program described in Section 5.3.5.6.
3	Extent of grid modularization		N/A	N/A	N/A	N/A	17.08	Number of sectionalizing and automated grid control devices per circuit mile	
	Extent of grid modularization in HFTD		N/A	N/A	N/A	N/A	11.35		
4	Data collection and reporting						75%	Percent of data requested in SDR and WMP Collected in initial submission	Qualitative answer which takes into consideration not applicable sections noted throughout the WMP

2.3 Recent performance on outcome metrics, annual and normalized for weather, last 5 years

The following table includes PacifiCorp's recent performance on outcome metrics, annual and normalized for weather over the last 5 years. As PacifiCorp's WMP and associated programs were developed in 2019, all data reported before 2019 represents the company's interpretation of historic data in light of current programs, risk mapping, and circuit topography.

As included in the following tables, PacifiCorp interprets a fire threat (risk) condition (table 2; metric 2.2.a) to be a discovered finding that could be interpreted to reflect an increased probability of ignitions; in company standards this attribute is designated as a Fire Risk Condition and is one which based on the inspection guidelines could be expected to pose a future fire risk if not corrected in a timely fashion. See Section 5.3.4 for more information.

As included in PacifiCorp's 2019 WMP⁹ and further contemplated in the company's Data Collection for WMPs Report¹⁰, PacifiCorp concluded that a circumstance where the potential exists for a fault creating a spark, which could result in the ignition of a fire if it lands in an adequate fuel bed, is considered a potential electric utility ignition event based on both the company's review of primary causes of fires in California and available CALFIRE data sets. PacifiCorp's outage records, which document the frequency, duration, and cause of outages experienced on energized circuits, represent the most accurate depiction of how often these potential ignitions may have occurred within the company's service territory. These records were applied using the methodology included in PacifiCorp's Data Collection for WMPs Report to populate applicable values in the table below and all potential ignition event related values throughout the company's 2020 WMP.

Since the approval of PacifiCorp's 2019 WMP, the company has developed additional data collection processes consistent with conditions of the approval, including the establishment of a Fire Incident Data Reporting process and wires down events, PacifiCorp has improved its data collection methods. These efforts have likely resulted in identifying more events that could be categorized as "fires potentially involving utility equipment" or "wires down", causing an increase event counts. Prior years' data was reliant on interpretation of comments contained generally in outage records and was likely not a comprehensive listing of the more minor occurrences; noteworthy occurrences were captured through other company processes, such as claims management procedures.

As discussed above, when reviewing this data, as well as any other data included in this plan, it is critical to understand that PacifiCorp identifies, tracks, and reports inspection based on facilities¹¹ as opposed to line miles. Additionally, as discussed in Section 2.2, PacifiCorp cautions against

⁹ See Section III.D.2 at page 24 of the Initial 2019 WMP of PacifiCorp filed 2/6/2019 pursuant to Senate Bill 901, Rulemaking (R.)18-10-007

¹⁰ See PacifiCorp (U 901 E) Data Collection for Wildfire Mitigation Plans Report filed 7/30/19 pursuant to Senate Bill 901, and the California Public Utilities Commission Rulemaking (R.)18-10-007, Decision (D.)19-05-036

¹¹ "Facilities" refers to a location where PacifiCorp has one or more assets installed. Usually, this would mean a pole or structure but could also be pad-mounted switchgear, a substation, or a switching station. These facilities are included in the GIS data requested in Section 2.7.

drawing any meaningful conclusions regarding annual trends when reviewing inspection and correction metrics as included in the document. Instead, PacifiCorp recommends using the full data set provided to calculate qualitative multi-year averages, identify the relative range of values that can be expected, and understand qualitative relative order of magnitude for comparison to other utilities.

Table 2: Recent performance on outcome metrics, last 5 years

Metric Type	#	Outcome Metric Name	Annual Performance					Unit(s)	Comments
			2015	2016	2017	2018	2019		
Near Misses	1.a.	Number of all events (such as unplanned outages, faults, conventional blown fuses, etc.) that could result in ignition, by type according to utility-provided list (total)	1,257	796	1,096	777	1,122	Number per year	Not limited to fire season and includes major events
	1.b.	Number of all events (such as unplanned outages, faults, conventional blown fuses, etc.) that could result in ignition, by type according to utility-provided list (normalized)	0.061	0.217	0.048	0.064	0.115	Number per RFW circuit mile day per year	
	1.c.	Number of wires down (total)	47	53	81	32	80	Number of wires down per year	Not limited to fire season and includes major events and potential ignition sources
	1.d.	Number of wires down (normalized)	0.002	0.014	0.004	0.003	0.008	Number of RFW circuit mile day per year	
Near Misses (limited to fire season)	1.a.2	Number of all events (such as unplanned outages, faults, conventional blown fuses, etc.) that could result in ignition, by type according to utility-provided list (total)	417	191	277	260	311	Number per year	Limited to fire season and includes major events
	1.b.2	Number of all events (such as unplanned outages, faults, conventional blown fuses, etc.) that could result in ignition, by type according to utility-provided list (normalized)	0.020	0.052	0.012	0.021	0.032	Number per RFW circuit mile day per year	

Metric Type	#	Outcome Metric Name	Annual Performance					Unit(s)	Comments
			2015	2016	2017	2018	2019		
	1.c.2	Number of wires down (total)	7	6	8	8	19	Number per year	Limited to fire season and includes major events and potential ignition sources
	1.d.2	Number of wires down (normalized)	0.000	0.002	0.000	0.001	0.002	Number per RFW circuit mile day per year	
Utility Inspection Findings	2.a.	Number of Level 1 findings that could increase the probability of ignition discovered per circuit mile inspected	0.03	0.07	0.05	0.14	0.10	Average number of Level 1 findings that could increase the probability of ignition discovered by all inspections per circuit mile per year	PacifiCorp schedules, completes, and tracks inspection performance on a "per facility" basis as opposed to a "per mile" basis. However, equivalent inspection miles were extrapolated in years 2015-2019 assuming little to no changes in grid topology. Furthermore, PacifiCorp implemented its HFTD mapping as well as fire threat condition programs fully in 2019. PacifiCorp has attempted to interpret current day policies and apply to previous inspection and correction programs. However, sometimes this was not possible due to lack of specific data. Therefore, all data from 2015-2019 should be viewed as qualitative and not absolute.
	2.b	Number of Level 2 findings that could increase the probability of ignition discovered per circuit mile inspected	0.33	0.25	0.19	0.26	0.18	Average number of Level 2 findings that could increase the probability of ignition discovered by all inspections per circuit mile per year	
	2.c.	Number of Level 3 findings that could increase the probability of ignition discovered per circuit mile inspected	0	0	0	0	0	Average number of Level 3 findings that could increase the probability of ignition discovered by all inspections per circuit mile per year	
Customer Hours of PSPS and other outages	3.a.	Customer hours of planned outage including PSPS (total)	47,595	60,799	58,405	70,909	80,071	Total customer hours of planned outages per year	Only planned outages, not limited to fire season and includes major events

Metric Type	#	Outcome Metric Name	Annual Performance					Unit(s)	Comments
			2015	2016	2017	2018	2019		
	3.b.	Customer hours of planned outages including PSPS (normalized)	2.33	16.57	2.58	5.82	8.19	Total customer hours of planned outages per RFW circuit mile day per year	
	3.c.	Customer hours of unplanned outages, not including PSPS (total)	215,936	81,069	297,749	91,502	29,1163	Total customer hours of unplanned outages per year	Excludes planned outages, not limited to fire season and includes major events
	3.d.	Customer hours of unplanned outages, not including PSPS (normalized)	11	22	13	8	30	Total customer hours of unplanned outages per RFW circuit mile day per year	
	3.e.	Increase in System Average Interruption Duration Index (SAIDI)	(51.63)	(39.24)	(20.51)	(13.24)	(3.40)	Change in minutes as compared to the previous year	Excludes Major events and planned outages, not limited to fire season
	3.f.	Customer hours of unplanned outages not including PSPS or Major Events (total)	75,364	66,115	53,724	42,709	50,376	Total customer hours of unplanned outages per year	Excludes planned outages, not limited to fire season and excludes major events No PSPS events have occurred.
	3.g.	Customer hours of unplanned outages not including PSPS or Major Events (normalized)	3.69	18.02	2.37	3.51	5.15	Total customer hours of unplanned outages per RFW circuit mile day per year	
Customer Hours of PSPS and other outages (limited to fire season)	3.a.1	Customer hours of planned outage including PSPS (total)	12,769	27,161	14,390	45,532	24,591	Total customer hours of planned outages per year	Only planned outages, limited to fire season and includes major events
	3.b.1	Customer hours of planned outages including PSPS (normalized)	0.62	7.40	0.64	3.74	2.51	Total customer hours of planned outages per RFW circuit mile day per year	
	3.c.1	Customer hours of unplanned outages, not including PSPS (total)	31,142	16,386	8,298	47,841	20,950	Total customer hours of unplanned outages per year	Excludes planned outages, limited to fire season and includes major events
	3.d.1	Customer hours of unplanned outages, not including PSPS (normalized)	1.52	4.47	0.37	3.93	2.14	Total customer hours of unplanned outages per RFW circuit mile day per year	
	3.e.1	Increase in System Average Interruption Duration Index (SAIDI)	9.57	(49.73)	(1.13)	0.86	14.29	Change in minutes as compared to the previous year	Excludes Major events and planned outages, limited to fire season
	3.f.1	Customer hours of unplanned outages not including PSPS or Major Events (total)	20,991	15,922	8,280	9,208	20,827	Total customer hours of unplanned outages per year	Excludes planned outages, limited to fire season and

Metric Type	#	Outcome Metric Name	Annual Performance					Unit(s)	Comments
			2015	2016	2017	2018	2019		
	3.g.1	Customer hours of unplanned outages not including PSPS or Major Events (normalized)	1.03	4.34	0.37	0.76	2.13	Total customer hours of unplanned outages per RFW circuit mile day per year	excludes major events. No PSPS events have occurred.
Utility Ignited wildfire fatalities	4.a.	Fatalities due to utility-ignited wildfire (total)	0	0	0	0	0	Number of fatalities per year	
	4.b.	Fatalities due to utility-ignited wildfire (normalized)	0	0	0	0	0	Number of fatalities per RFW circuit mile day per year	
Accidental deaths resulting from utility wildfire mitigation activities	5.a.	Deaths due to utility wildfire mitigation activities (total)	0	0	0	0	0	Number of fatalities per year	
OSHA reportable injuries from utility wildfire mitigation initiatives	6.a.	OSHA-reportable injuries due to utility wildfire mitigation activities (total)	N/A	N/A	N/A	N/A	0	Number of OSHA-reportable injuries per year	PacifiCorp diligently tracks all safety statistics including but not limited to accidental deaths, OSHA-reportable, or near misses. However, as PacifiCorp is early in its WMP implementation, it is challenging to report historic safety statistics regarding wildfire mitigation programs as requested, specifically any values prior to 2019 as these programs did not exist. Therefore, PacifiCorp was not able to populate all cells within the applicable tables.
	6.b.	OSHA-reportable injuries due to utility wildfire mitigation activities (normalized)	N/A	N/A	N/A	N/A	0	Number of OSHA-reportable injuries per year per 1000 line miles of grid	PacifiCorp diligently tracks all safety statistics including but not limited to accidental deaths, OSHA-reportable, or near misses. However, as PacifiCorp is early in its WMP implementation, it is challenging to report historic safety statistics regarding wildfire mitigation programs as requested, specifically any values prior to 2019 as these programs did not exist.

Metric Type	#	Outcome Metric Name	Annual Performance					Unit(s)	Comments
			2015	2016	2017	2018	2019		
									Therefore, PacifiCorp was not able to populate all cells within the applicable tables.
Value of assets destroyed by utility-ignited wildfire, listed by asset type	7.a.	Value of assets destroyed by utility-ignited wildfire (total)	\$98,492	\$0	\$0	\$0	\$225,692	Dollars of damage or destruction per year	
	7.b.	Value of assets destroyed by utility-ignited wildfire (normalized)	\$5	\$0	\$0	\$0	\$23	Dollars of damage or destruction per RFW circuit mile day per year	
Structures damaged or destroyed by utility ignited wildfire	8.a.	Value of structures destroyed by utility-ignited wildfire (total)	\$85,728	\$0	\$0	\$0	\$15,000	Number of structures destroyed per year	
	8.b.	Value of structures destroyed by utility-ignited wildfire (normalized)	\$4.19	\$0.00	\$0.00	\$0.00	\$1.53	Number of structures destroyed per RFW circuit mile day per year	
Acreage burned by utility-ignited wildfire	9.a.	Acreage burned by utility ignited wildfire (total)	16	5	3	1	126	Acres burned per year	Acreage burned is an approximate value, and is not limited to wildfire. In some cases the field references the burn area as a small fire (typically a small grass fire), these fires are often under a half acre in size. For calculation purposes, fires with this designation were calculated as a half-acre. In addition CALFIRE fire perimeters were also evaluated for utility ignitions from 2015-2018 (2019 has yet to be released), and no utility caused outages occurred in PacifiCorp's Service territory.
	9.b.	Acreage burned by utility-ignited wildfire (normalized)	0.001	0.001	0.000	0.000	0.013	Acres burned per RFW circuit year	
Number of utility wildfire ignitions	10.a.	Number of ignitions (total) according to existing ignition data reporting requirement	2.00	6.00	4.00	4.00	14.00	Number per year	Fire locations are mapped to the best known location. Actual locations may vary given the data provided by the field. In some cases an address was unknown and therefore the fire
	10.b.	Number of ignitions (normalized)	0.0001	0.0016	0.0002	0.0003	0.0014	Number per RFW circuit mile per year	
	10.c.	Number of ignitions in HFTD (subtotal)	2.00	2.00	1.00	3.00	5.00	Number in HFTD per year	

Metric Type	#	Outcome Metric Name	Annual Performance					Unit(s)	Comments
			2015	2016	2017	2018	2019		
	10.c.i	Number of ignitions in HFTD Zone 1	0.00	0.00	0.00	0.00	0.00	Number in HFTD Zone 1 per year	was mapped to the closest known outage location.
	10.c.ii	Number of ignitions in HFTD Tier 2	2.00	2.00	1.00	3.00	5.00	Number in HFTD Tier 2 per year	
	10.c.iii	Number of ignitions in HFTD Tier 3	0.00	0.00	0.00	0.00	0.00	Number in HFTD Tier 3 per year	
	10.d.	Number of ignitions in HFTD (subtotal, normalized)	0.00	0.00	0.00	0.00	0.00	Number in HFTD per RFW circuit mile day per year	
	10.d.i.	Number of ignitions in HFTD Zone 1 (normalized)	0.00	0.00	0.00	0.00	0.00	Number in HFTD Zone 1 per RFW circuit mile day per year	
	10.d.ii.	Number of ignitions in HFTD Tier 2 9Normalized)	0.00	0.00	0.00	0.00	0.00	Number in HFTD Tier 2 per RFW circuit mile day per year	
	10.d.iii.	Number of ignitions in HFTD Tier 3 (normalized)	0.00	0.00	0.00	0.00	0.00	Number in HFTD Tier 3 per RFW circuit mile day per year	
	10.e.	Number of ignitions in non-HFTD (subtotal)	0.00	4.00	3.00	1.00	9.00	Number in non-HFTD per year	
	10.f.	Number of ignitions in non-HFTD (normalized)	0.00	0.00	0.00	0.00	0.00	Number in non-HFTD per RFW circuit mile day per year	
Critical infrastructure impacted	11.a.	Critical infrastructure impacted by PSPS	0.00	0.00	0.00	0.00	0.00	Number in non-HFTD per RFW circuit mile day per year Number of critical infrastructure (in accordance with D.19-05-042) locations impacted per hour multiplied by hours offline per year	
	11.b.	Critical infrastructure impacted by PSPS (normalized)	0.00	0.00	0.00	0.00	0.00	Number of critical infrastructure (in accordance with D.19-05-042) locations impacted per hour multiplied by hours offline per RFW circuit mile day per year	

2.4 Description of additional metrics

In 2019, PacifiCorp proposed the addition of a series of metrics that were aligned to performance such that, as time passed, the metric results could be reasonably correlated to actions taken by the company in the execution of its WMP. Some of these additional metrics were included as part of the Standard Data Request, while others are more significantly different, but are reasonably correlated to better wildfire resilience of the utility equipment.

As noted in previous filings, PacifiCorp will make data available upon request to pertinent entities or individuals, such as universities or researchers including for validation purposes. PacifiCorp also includes progress reports regarding any WMP programs or initiatives on the company's public website. PacifiCorp viewed participation in regulatory proceedings, discovery requests, and workshops as opportunity to present data, engage third parties, solicit feedback, and, where appropriate, seek validation or make necessary changes to any program or initiative. This general approach has been applied to all metrics or data sets, including those in the table below.

Table 3: List and description of additional metrics, last 5 years¹²

Metric	Performance					Unit(s)	Underlying Assumptions	Third-party Validation
	2015	2016	2017	2018	2019			
PC3a.Events Recorded with Fire Reference: Not Fire Season	14	10	1	7	20	Outage event(s)	Data source is outage reporting system in which outage makes reference to fire in comment or outage cause	As noted in previous filings, PacifiCorp will make data available upon request to pertinent entities or individuals, such as universities or researchers. PacifiCorp also includes progress reports regarding any WMP programs or initiatives on the company's public website. PacifiCorp also viewed participation in regulatory proceedings, discovery requests, and workshops as opportunity to present data, engage third parties, solicit feedback, and, where appropriate, seek validation or make necessary changes to any program or initiative. This general approach has been applied to all metrics or data sets, including those in this table.
PC3b.Events Recorded with Fire Reference: Fire Season	13	12	5	23	19	Outage event(s)		
PC4a. Events Recorded with Fire Reference: damage fire, equipment fire, pole fire: Not Fire Season	6	6	0	1	7	Outage event(s)	Subset of PC3 where record makes reference to utility equipment or key components	
PC4b. Events Recorded with Fire Reference: damage fire, equipment fire, pole fire: Fire Season	5	3	4	5	5	Outage event(s)		
PC5. Wire down risks	9	7	8	8	20	Outage event(s)	Data source is outage reporting system in which cause code or comments would result in downed conductor	
PC6. Wire down trend	NA	-2	1	0	12	Outage event(s)	Reduction in quantity of wire down events, year over year, during the designated fire season period	

¹² See PacifiCorp's July 30, 2019 filing UE901 per D. 19.05.069 for more background information and discussion of proposed metrics.

2.5 Description of program targets

In its 2019 WMP, PacifiCorp outlined specific actions intended to mitigate fire risk associated with its overhead equipment, a portion of which would be complete before the 2019 fire season as well as certain before its next WMP submission. These deliveries, in addition to effectiveness metrics the company outlined in its WMP, fulfill this plan requirement for program targets. Since 2019 was the first year of WMP implementation, all target completions are related to this first year's performance. Table 4 below includes a high level list and description of PacifiCorp's total program targets and 2019 progress to meet these overall program targets. PacifiCorp attempted to populate the Table 4 template in a way that clearly describes and accurately depicts the company's program targets. PacifiCorp augmented the table slightly to provide additional detail and context while also meeting the requirements to provide program targets. Additional data regarding PacifiCorp's progress toward the company's 2019 WMP activities and initiatives is included in Section 5.0.

Table 4: List and description of total program targets, 2019 progress^{13 14}

Program Details			Total Program Targets		2019 Progress		Underlying assumptions
Program	Initiative	Duration	Total Planned Unit(s)	Anticipated Completion (EOY)	2019 Performance / Update	Cumulative Percent Complete of Total Plan (%)	
Situational Awareness	Weather Station Installation	Multi-year (4 yr)	35 stations	2022	10 stations	29%	See Section 5.3.2.1
Asset management and inspections	Enhanced transmission inspections using IR/alternate technologies	Single pilot project (2 yr)	1 Pilot Project	2020	Implemented pilot project; 100% of total data collected	75%	See Section 5.3.4.5
	Complete planned inspections, including additional HFTD inspections	Annual program/target	3,311 equivalent line miles	Annual / on-going	3,310 equivalent line-miles	99.9% in 2019	See Section 5.3.4.3

¹³ Changed from "last 5 years" per WMP Clarification Document issued 1/15/2020.

¹⁴ As discussed in more detail above, PacifiCorp will make data available upon request to pertinent entities or individuals, such as universities or researchers for third-party validation purposes. For Table 4, third party validation has been removed as a separate column.

Program Details			Total Program Targets		2019 Progress		Underlying assumptions
Program	Initiative	Duration	Total Planned Unit(s)	Anticipated Completion (EOY)	2019 Performance / Update	Cumulative Percent Complete of Total Plan (%)	
	Implement LiDAR inspection pilot project for distribution and transmission lines	Single pilot project (2 yr)	1 Pilot Project	2020	Completed flights and collection of data	75%	See Section 5.3.4.7
System Hardening:	Installation of Covered Conductor	Multi-year (5 yr)	221 line-miles	2023	Engineering and scoping completed for 38 line-miles planned in 2020	10%	See Section 5.3.3.3
	Replacement of Cu Conductor	Multi-year (5 yr)	53 line miles	2023	Engineering specification and scope completed for 3 line miles planned in 2020;	3%	See Section 5.3.3.18
	Installation of System Automation Equipment	Multi-year (4 yr)	68 projects	2022	10 projects complete	15%	See Section 5.3.3.9
	Proactive Wood Pole Replacement	Multi-year (5 yr)	4,000	2023	Engineering standard and specification completed;	10%	See Section 5.3.3.6
Vegetation Management and Inspections: Vegetation Management and Inspections:	Detailed inspections of vegetation around distribution (and transmission) electric lines and equipment	Annual program/target	1,170 line miles	Annual / on-going	1,170 line-miles	100% in 2019	See Section 5.3.5.2 & Section 5.3.5.3
	Other – Radial Pole Clearing	Annual program/target	15,060 poles	Annual / on-going	14,132 poles expanded program in 2019, full program in 2020	94% in 2019	See Section 5.3.5.9

2.6 Detailed information supporting outcome metrics

The following tables include PacifiCorp's detailed information supporting outcome metrics over the last five years.

PacifiCorp tracks all safety statistics including, but not limited to, accidental deaths, OSHA-reportable, or near misses. However, as PacifiCorp is early in its WMP implementation, reporting historic safety statistics regarding wildfire mitigation programs as requested is challenging, specifically with respect to any values prior to 2019 because these programs did not explicitly exist. Therefore, PacifiCorp was not able to populate all cells within the applicable tables.

However, as PacifiCorp's wildfire mitigation programs were implemented beginning in 2019, values from 2019 have been included. PacifiCorp moving forward will ensure these elements are properly tracked consistent with this requirement.

Table 5: Accidental deaths due to utility wildfire mitigation initiatives, last 5 years

Activity	Victim															Total
	Full-Time Employee					Contractor					Member of Public					
Year	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019	
Inspection	N/A	N/A	N/A	N/A	0	N/A	N/A	N/A	N/A	0	N/A	N/A	N/A	N/A	0	0
Vegetation Management	N/A	N/A	N/A	N/A	0	N/A	N/A	N/A	N/A	0	N/A	N/A	N/A	N/A	0	0
Utility Fuel Management	N/A	N/A	N/A	N/A	0	N/A	N/A	N/A	N/A	0	N/A	N/A	N/A	N/A	0	0
Grid Hardening	N/A	N/A	N/A	N/A	0	N/A	N/A	N/A	N/A	0	N/A	N/A	N/A	N/A	0	0
Other	N/A	N/A	N/A	N/A	0	N/A	N/A	N/A	N/A	0	N/A	N/A	N/A	N/A	0	0
Total	N/A	N/A	N/A	N/A	0	N/A	N/A	N/A	N/A	0	N/A	N/A	N/A	N/A	0	0

Table 6: OSHA-reportable injuries due to utility wildfire mitigation initiatives, last 5 years

Activity	Victim															Total
	Full-Time Employee					Contractor					Member of Public					
Year	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019	
Inspection	N/A	N/A	N/A	N/A	0	N/A	N/A	N/A	N/A	0	N/A	N/A	N/A	N/A	0	0
Vegetation Management	N/A	N/A	N/A	N/A	0	N/A	N/A	N/A	N/A	0	N/A	N/A	N/A	N/A	0	0
Utility Fuel Management	N/A	N/A	N/A	N/A	0	N/A	N/A	N/A	N/A	0	N/A	N/A	N/A	N/A	0	0
Grid Hardening	N/A	N/A	N/A	N/A	0	N/A	N/A	N/A	N/A	0	N/A	N/A	N/A	N/A	0	0
Other	N/A	N/A	N/A	N/A	0	N/A	N/A	N/A	N/A	0	N/A	N/A	N/A	N/A	0	0
Total	N/A	N/A	N/A	N/A	0	N/A	N/A	N/A	N/A	0	N/A	N/A	N/A	N/A	0	0

PacifiCorp has not developed specific algorithms to model ignition beyond those that were inherent in the risk-based modeling foundational to the California Fire Map development. Within that process fire spread was modeled based upon historic fire weather overlaid onto terrain (independent of the location of utility assets) and with assumed “extreme case” fuel conditions. Notwithstanding this data source, through the map development process, as territory leads, PacifiCorp’s local and corporate personnel assessed impacts to communities via historical and professional experience lenses. Thus, certain areas which may have indicated lower impact risks were elevated due to historic egress or access issues or from input gained during normal and extreme operating conditions.

Table 7: Methodology for potential impact of ignitions

List of all data inputs used in impact simulation	Sources of data inputs	Data selection and treatment methodologies	Assumptions, including SME input	Equation(s), functions, or other algorithms used to obtain output	Output type(s), e.g. wind speed model	Comments
Historic fire weather	CALFIRE shape files, USFS map products, cause data	2007 thru 2019	Historic perimeters serve as potential future fire risk areas	N/A	Map of elevated areas	
Terrain	GIS data	All geography served by company	Terrain constant over time	N/A	N/A	
Fuel conditions	Landfire data	All geography served by company	Fuel not substantially different over long time continuum	N/A	N/A	
Historic egress/access issues	Map products (Tiger, Google)	All geography served by company	Local operational input; map review of egress and fire history	N/A	Elevation of CALFIRE led map product	

2.7 Mapping recent, modelled, and baseline conditions

PacifiCorp incorporated the company's 1 mile x 1 mile grid to document and determine boundaries in both the GIS data submitted as well as the data used to populate applicable tables. Data was provided at the resolution of square mile as requested. It is critical to note that the data submitted and included in the applicable tables reflects a static snapshot in time of a dynamic changing data set and system. Over time, as PacifiCorp's WMP evolves either through rulemaking, data requests, additional discovery, workshops, and collaboration with both Staff and stakeholder, it is expected that this data can and will change.

PacifiCorp has included all data requested to the extent that the data requested is a mapped feature and could be prepared and provided in a way that facilitates the delivery of the company's WMP, facilitates the ability to repeat the data population and analysis, does not compromise the data quality, and supports further development of elements and supplemental analysis to inform decision making. To accomplish the tasks requested in this section and included in Tables 8 and 9 while ensuring alignment with the above approach, PacifiCorp, at the time of this filing, was not able to further subdivide the company's grid to the requested quarter mile resolution. As this would require PacifiCorp to deliver data and analysis in a way not currently processed or contemplated through standard operations, PacifiCorp was unable to provide this level of resolution. However, where applicable, the requested data was prepared and provided at the square mile resolution of the company's 1 mile x 1 mile grid.

Treatment of Confidential Data

In order to facilitate public access to the company's WMP, where possible, PacifiCorp has provided all requested location-specific GIS data with applicable attributes and details in alignment with the requirements in Table 8 and Table 9 and included in the attachments in Section 6.0 at a level that does not implicate confidential data. In order to achieve this objective, the company provided the general location of lines and facilities similar to other publicly available data sets in the GIS attachments; PacifiCorp determined that even at this "higher" level of detail, the data was useful and responsive. In addition, general information was used to populate applicable tables, such as grid modularization summary values in Table 1 and fault indicator summary values in Table 15. The data provided can be used to determine and inform a qualitative analysis and benchmarking with other utilities throughout California without the need to provide all supporting confidential data; providing such large quantities of confidential data creates risks that are not outweighed by the perceived benefits. PacifiCorp suggests an in-person meeting with WSD to discuss whether additional, narrowly tailored data is necessary for its review.

Use of Census Population Data

Per the WMP Clarification Document circulated on 1/15/2020, PacifiCorp leveraged the boundaries of the census tract data available at census.gov (<https://www.census.gov/geographies/mapping-files/time-series/geo/tiger-line-file.html>). This tract data was then overlaid with PacifiCorp's 1 mile x 1 mile grid to calculate the equivalent population per square mile within each of the company's 1 mile x 1 mile grids. PacifiCorp then applied the definitions within the CA WMP, CFR 17.701, and GO 165 to classify each 1 mile x 1 mile grid as being either highly rural, having a population

density less than 7 persons per square mile, rural, having a population density of less than 1,000 persons per square mile, or urban, having a population density greater than 1,000 person per square mile. The calculation and depiction of locations within PacifiCorp's service territory as highly rural, rural, and urban is consistent with the requirements in the WMP and definitions included in the Glossary.

In contrast to how PacifiCorp applies district level population density to characterizes the company's service territory as urban or rural consistent with the methodology and requirements found in rule 21.2 in CA General Order 95, the census data provided was extrapolated and calculated discretely for each 1 mile x 1 mile grid to classify grids as urban, rural, or highly rural as opposed to districts. Therefore, PacifiCorp cautions making any correlations between the district classifications used for compliance with CA GO 95 and the grid values presented in this document.

Incorporation of Wildlife Urban Interface

PacifiCorp leveraged and incorporated the GIS shape files generated between 2005 and 2007 which encompasses the entire state of California noting the Fire Hazard Severity Zone map which triggers WUI requirements in Chapter 7A of the California Building Code, which is an effective approach to incorporating the WUI to meet the requested requirements of this section.

Identification of Access and Functional Needs Customers

PacifiCorp continues to develop methods to expand customers identified with access and functional needs (AFN). PacifiCorp modified its customer service billing system to identify AFN customers; identifying AFN customers through the billing system allows the company to easily export a customer list for both individual customer outreach and updating our internal mapping system.

The company can identify customers currently billed on the medical baseline rate; all customers on this rate schedule were coded as AFN. The next step was outreach to the communities in PacifiCorp's service territory encouraging AFN customers to contact the company to self-identify. The PSPS webpage was also updated to include a FAQ that directed customers reliant on electricity for mobility or medical concerns to contact the company in order to code such customers as AFN. A letter and brochure were distributed to community partners throughout areas identified as either Tier 3 or a high fires risk area. The recipients included the following: the Karuk Tribe Community Center, local hospitals, medical supply companies, Great Northern (a resource center for energy assistance and other community support), the Red Cross, Siskiyou County's Emergency Manager, Social Services, and Public Health Departments, the Salvation Army, and master metered communities. The letter requested that each entity distribute the brochure which included information on cost savings programs, outage preparedness specific to AFN customers, and requested that the entity's clients contact the company to self-identify as an AFN. Over a thousand brochures were mailed and the company will be following up with the entities on the efficacy of the literature. PacifiCorp will continue to monitor the list of AFN customers to evaluate the impact of its communication. The company anticipates that the number of AFN customer will continue to grow and change as more customers become aware of this option. For the preparation of the data set requested, including the GIS data provided as requested in Table 9, a current snapshot of PacifiCorp's list of AFN customers was provided based on the methodology described above.

2020 WMP Planned Activity

PacifiCorp also included, as requested in Table 9, the company's planned 2020 WMP initiative activity per year in the GIS layer attached as Section 6.6. System wide programs, such as inspection and correction programs or emergency planning programs, were not included in this layer as these programs apply system wide each year and are not location specific. Location specific programs, included in Section 5.3.3 were included.

As PacifiCorp is early in the implementation of its multi-year plan, the detailed scope for each location specific program activity has only been completed for the 2020 year. While the full scope of the multi-year programs is well understood and program dollars have been assigned in years 2021-2022 and included in Table 23 of Section 5.3.3, the specific locations and associated asset replacements have yet to be determined for each program in each year. However, PacifiCorp's location specific programs do include the completion of more detailed scope for years beyond 2020 to be completed during the 2020 calendar year, which is reflected in PacifiCorp's strategy included in Section 5.1. Where the annual scope has not yet been defined or specifically provided, PacifiCorp intends to follow the methodology described in Section 5 which includes systematic targeting of Tier 3 locations first followed by Tier 2, and Zone 1 or, where appropriate, the program specific methodology described for each program. A specific layer was not included regarding the 2020 pole replacement activity, as the location of this work is coincident to other planned program activity in 2020. See Section 5.3.3.6 for more information regarding planned work and prioritization methods.

Furthermore, as previously expressed at the September 2019 workshops, in the company's October 30, 2019 Phase II comments, in PacifiCorp's First Report Regarding Possible Off-Ramps¹⁵, and Section 5 of this WMP, PacifiCorp anticipates that as these projects and programs are subject to evaluation in an effort to drive continuous improvement, specifics may need to change and adapt in response to changing conditions, resource constraints, and lessons learned.

See attached files in accordance with Table 8 requirements in Sections 6.1 – 6.3.

¹⁵ PacifiCorp's First Report Regarding Possible Off-Ramps was filed on November 27, 2019 in compliance with Decision 19-05-036.

Table 8: Map file requirements for recent and modelled conditions of utility service territory, last 5 years

Layer name	Measurements	Units	Attachment location
Recent weather patterns	Average annual number of Red Flag Warning days per square mile across service territory	Area, days, square mile resolution	6.1
	Average 95 th and 99 th percentile wind speed and prevailing direction (actual)	Area, miles per hour, at a square mile resolution or better, noting where measurements are actual or interpolated	
Recent drivers of ignition probability	Date of recent ignitions categorized by ignition probability driver	Point, GPS coordinate, days, square mile resolution	6.2
Recent use of PSPS	Duration of PSPS events and area of the grid affected in customer hours per year	Area, customer hours, square mile resolution	6.3

See attached files in accordance with Table 9 requirements in Sections 6.4-6.6.

Table 9: Map file requirements for baseline condition of utility service territory projected for 2020

Layer name	Measurements / variables	Units	Appendix location
Current baseline state of service territory and utility equipment	Non-HFTD vs HFTD (Zone 1, Tier 2, Tier 3) regions of utility service territory	Area, square mile resolution per type	6.4
	Urban vs. rural vs. highly rural regions of utility service territory	Area, square mile resolution per type	
	WUI regions of utility service territory	Area, square mile resolution	
	Number and location of critical facilities	Point, GPS coordinate	
	Number and location of customers	Area, number of people, square mile resolution	
	Number and location of customers belonging to access and functional needs populations	Area, number of people, square mile resolution	
	Overhead transmission lines	Line, quarter mile resolution	
	Overhead distribution lines	Line, quarter mile resolution	
	Location of substations	Point, GPS coordinate	
	Location of weather stations	Point, GPS coordinate	
	All utility assets by asset type, model, age, specifications, and condition	Point, GPS coordinate	
Location of planned utility equipment additions or removal	Non-HFTD vs HFTD (Zone 1, Tier 2, Tier 3) regions of utility service territory	Line, quarter mile resolution	6.5
	Urban vs. rural vs. highly rural regions of utility service territory	Line, quarter mile resolution	
	WUI regions of utility service territory	Line, quarter mile resolution	
	Circuit miles of overhead transmission lines	Line, quarter mile resolution	
	Circuit miles of overhead distribution lines	Line, quarter mile resolution	
	Location of substations	Point, GPS coordinate	
Planned 2020 WMP initiative activity per year	Location of 2020 WMP initiative activity for each activity as planned to be completed by the end of each year of the plan term	Line, quarter mile resolution	6.6 ¹⁶

¹⁶ WMP Guidelines, Attachment 1, includes this value published as 7.6. PacifiCorp assumes this to be in error and has, instead, included this in attachment 6.6.

3. Baseline Ignition Probability and Wildfire Risk Exposure

In PacifiCorp's 2019 WMP, the company explored historic wildfires, both independent of ignition source as well as honing in on those which could be attributed to utility ignition sources. Further, while ignition risks exist year round (whether due to human, natural or utility causes), the probability of sustaining those ignitions is well-correlated to environmental criteria during the specific "fire season" appropriate for the local conditions.¹⁷

The graphic below shows conceptually the nexus of these inputs.

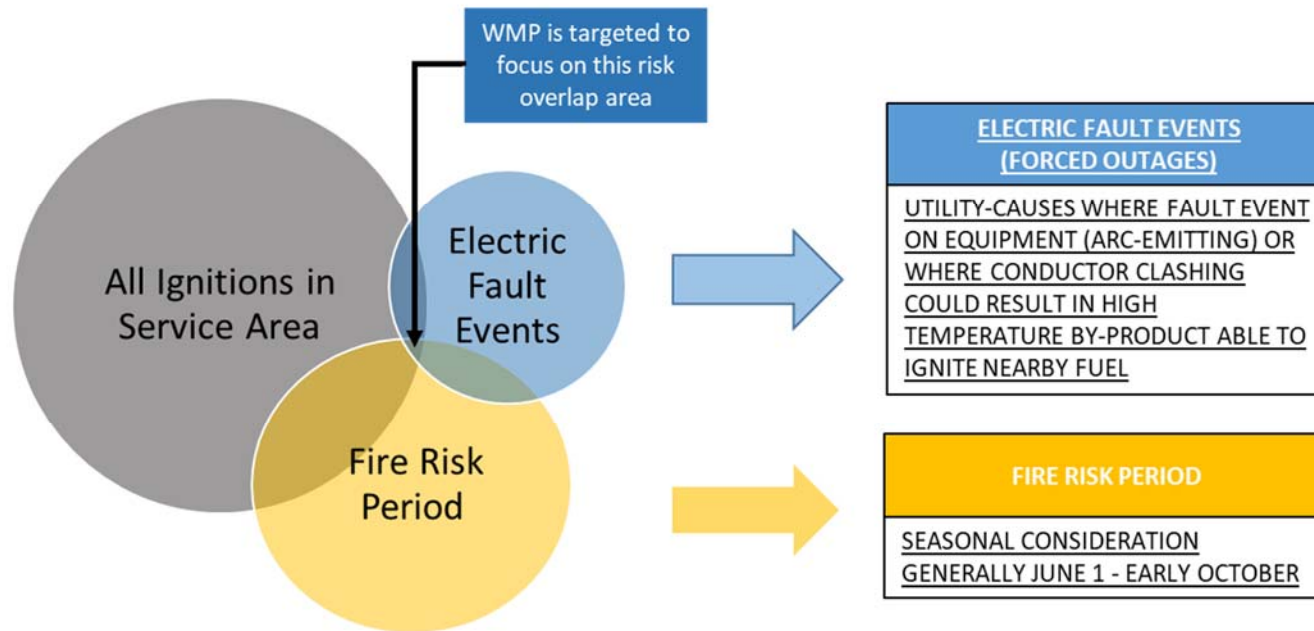


Figure 1: PacifiCorp's conceptual baseline ignition probability and wildfire risk exposure model

¹⁷ CALFIRE and others have noted that "fire season" is a year-round phenomenon in California, however in northern California, particularly the area in which PacifiCorp serves, this trend is not discernable in the data the Company has assembled and appears contrary to such fire risk indicators as Red Flag Warning days or National Fire Danger Rating System elevated days.

To support the model shown above, PacifiCorp took two particular views of the data. The first was ignition independent of the ignition source included in Figure 2 and Figure 3. The second evaluated fault events which could result in an ignition risk specific to PacifiCorp's service territory included as Figure 4, Figure 5, and Figure 6. Lastly, due to the substantial difference in the probability of sustaining an ignition source between fire season and non-fire season, the Company developed data supporting the historic trend of the beginning and end of fire season included as Figure 7. Each of these depictions of data are presented below to demonstrate the ignition risks within PacifiCorp's service territory.

Figure 2 below depicts PacifiCorp's evaluation of ignition sources within the company's service territory from 2007-2017 independent of ignition cause or seasonality of the ignition.

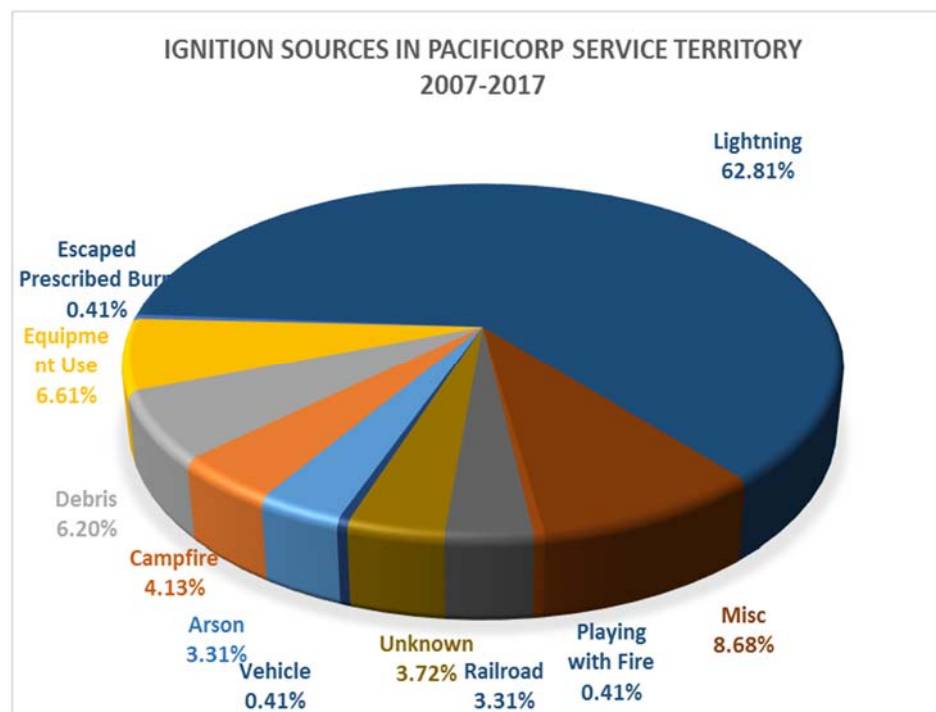


Figure 2: Ignition sources within PacifiCorp's service territory 2007-2017, independent of cause or seasonality

Figure 3 below depicts PacifiCorp's evaluation of ignition sources within the company's service territory specific to geographic wildfire risk tier from 2007-2017 independent of ignition cause or seasonality of the ignition.

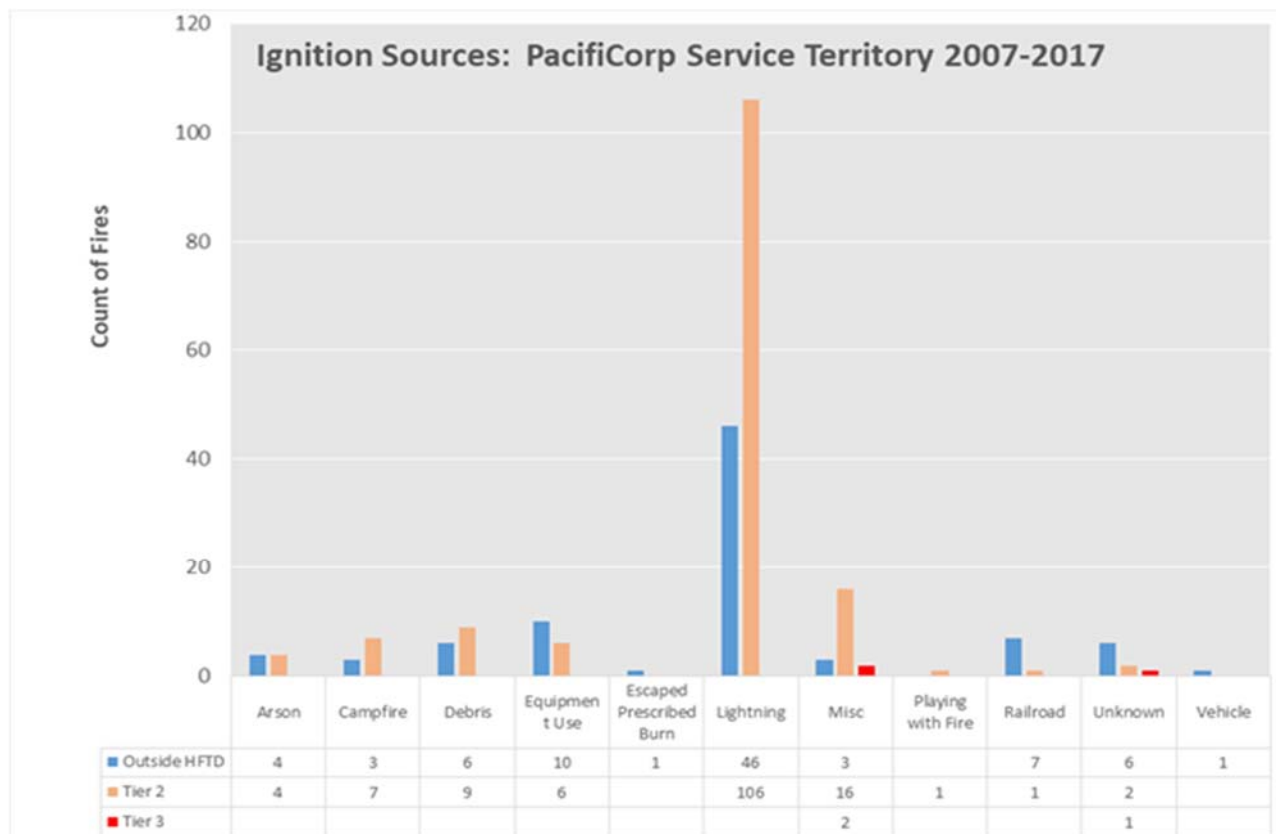


Figure 3: Ignition sources from 2007-2017 specific to geographic wildfire risk tier within PacifiCorp's service territory, independent of seasonality

Figure 4 below depicts PacifiCorp's evaluation of utility related outage events from 2015-2019 during fire season with the potential to result in an ignition event, classified by potential suspected initiating event type, as defined in D.14-01-015, page C-8. In Figure 5 and Figure 6 this data is further segmented focusing on contact and component elements. It is important to note that while this data set is helpful to identify potential fault scenarios that occur throughout PacifiCorp's service territory, the presence of an outage event with potential ignition risk does not explicitly infer that an ignition event has or will happen. This data was subsequently used to provide insight into PacifiCorp's ignition probability drivers.

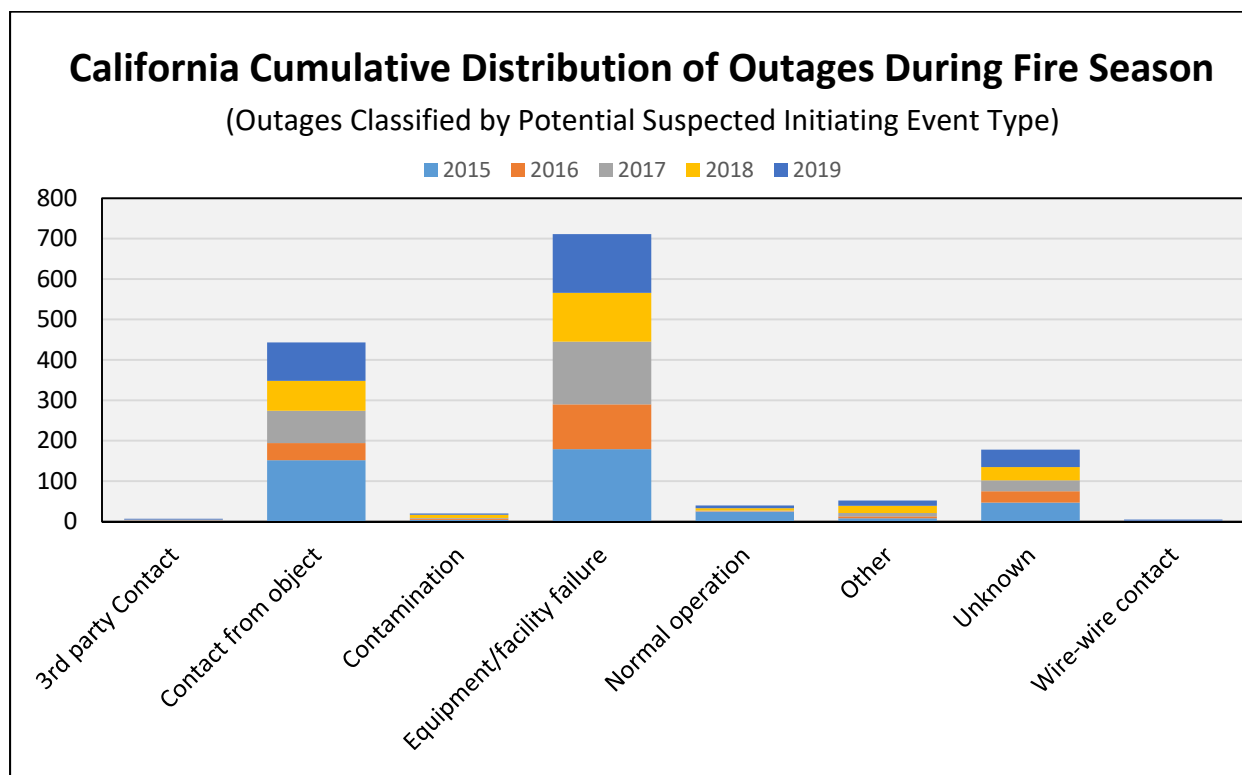


Figure 4: PacifiCorp's cumulative distribution of potential ignition events in California during fire season by outage cause category, 2014-2018

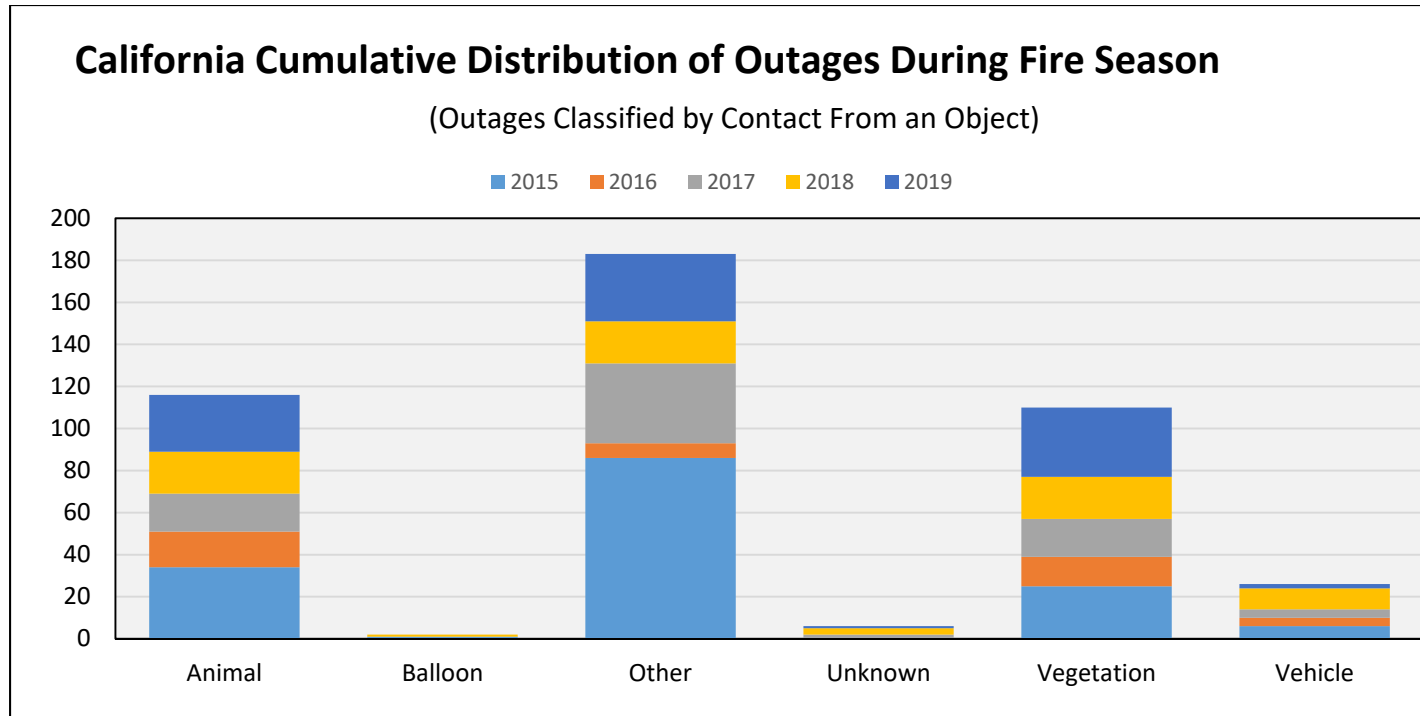


Figure 5: PacifiCorp's potential ignition events caused by contact from an object during fire season, 2015-2019

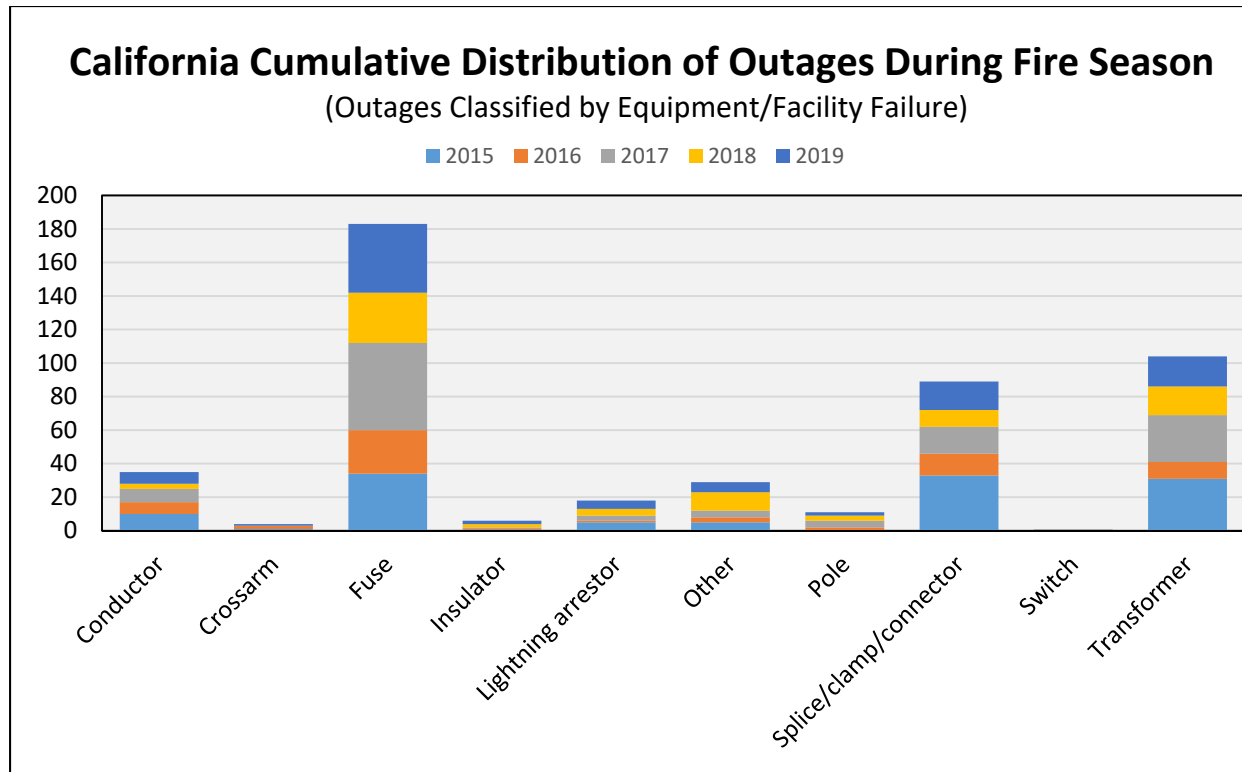


Figure 6: PacifiCorp's potential ignition events categorized as caused by equipment / facility failure during fire season, 2015-2019

Figure 7 below depicts the cumulative acres burned in both Northern California as well as PacifiCorp's service territory independent of the ignition cause per the fire initiation start date. This data set demonstrates that more acres are likely to burn in Northern California during fire season than other times of the year, confirming that elevated wildfire risk conditions are more likely during fire season.

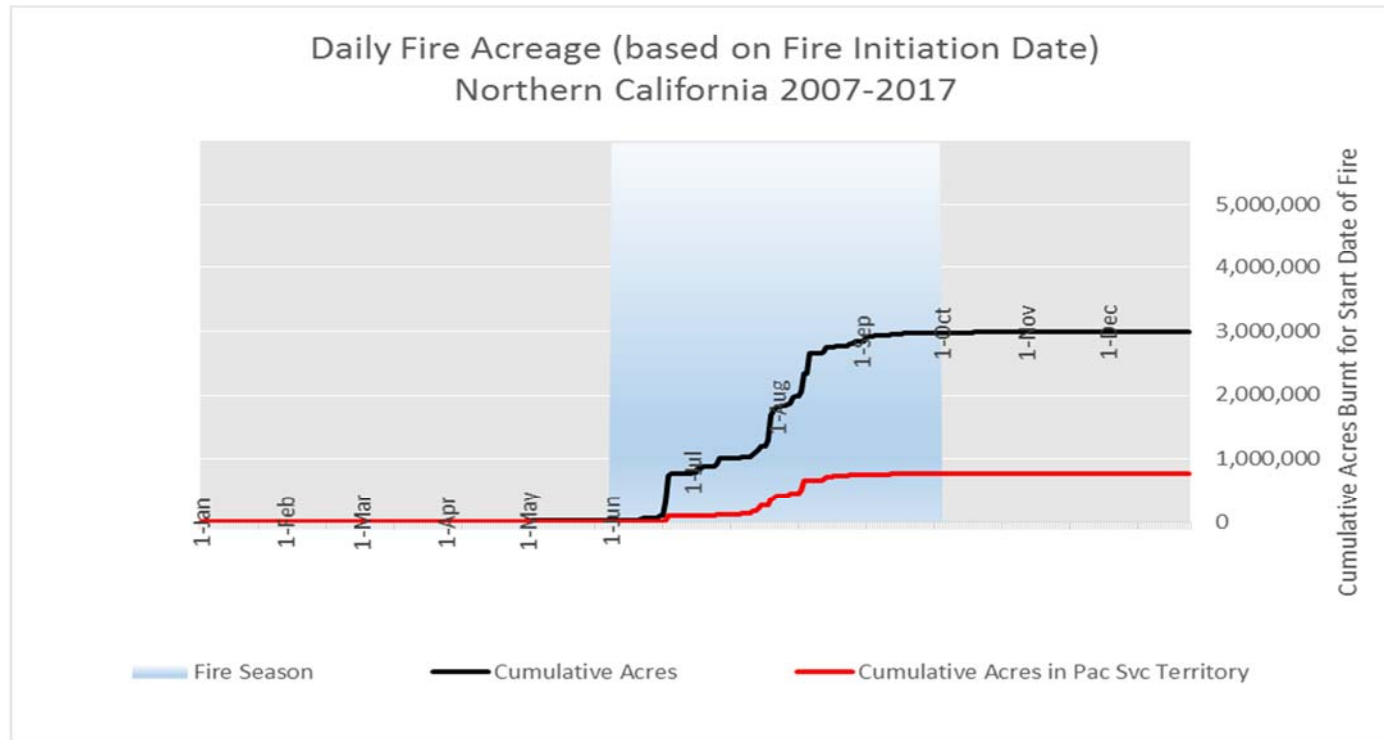


Figure 7: Fire acreage burned in Northern California per fire initiation start date, 2007-2017

3.1 Recent weather patterns, last 5 years

The following table includes PacifiCorp's weather analysis consistent with the method prescribed by the Wildfire Safety Division.

The company's proprietary measure for fire risk incorporates three key variables, including 1) dead fuel moisture measure, as measured by the Keetch Byram Drought Index (KBDI), 2) fire risk, as measured by a six-hour average of the Fosberg Fire Weather Index (FFWI6) and 3) fault risk, as measured by wind gust speed. While a sustained wind threshold is also monitored the company's experience to date indicates that gust wind thresholds appear to be trigger elevated risk periods more routinely than the sustained wind threshold being exceeded.

Table 10: Weather patterns, last 5 years

Weather Measurement	2015	2016	2017	2018	2019	5-yr historical Average	Unit(s)
Red Flag Warning days	20,443	3,669	22,645	12,175	9,781	13,743	RFW circuit mile days per year
Days rated at the top 30% of proprietary fire potential index or similar fire risk index measure ¹⁸	NA	NA	NA	NA	1,391	1,391	Circuit mile days where proprietary measure rated above top 30% threshold ¹⁹ per year
95th percentile wind conditions	11,811	20,069	15,625	13,541	13,215	14,852	Circuit mile days with wind gusts over 95th percentile historical (meaning the prior 10 years, 2005-2014) conditions per year
99th percentile wind conditions	1,106	3,031	1,420	197	1,003	1,351	Circuit mile days with wind gusts over 99th percentile historical (meaning the prior 10 years, 2005-2014) conditions per year
Other	NA	NA	NA	NA	NA	NA	

¹⁸ PacifiCorp does not calculate a blended fire potential index, rather it evaluates the coincidence of the three threshold metrics to determine fire risk. This process began in 2019, and the metric is calculated based upon the number of days in which the three thresholds were met in a "watch area" multiplied times the circuit miles within the "watch area".

¹⁹ Threshold here defined as top 30% of FPI or equivalent scale (e.g., "Extreme" on SCE's FPI; "extreme", 15 or greater, on SDG&E's FPI; and 4 or above on PG&E's FPI.

3.2 Recent drivers of ignition probability

The following table includes PacifiCorp's recent drivers of ignition probability over the last five years. While not explicitly stated in the table, these values reflect an absolute annual total and average, not accounting for elevated risk environmental conditions influenced by fire season; an alternate Table 11b demonstrates these drivers for the period where sustained fire risks exist. In PacifiCorp's service territory, which is exposed to substantially different fall/winter weather from the summertime, when fire risks exist, such differentiation is critical. Without this differentiation, wildfire mitigation measures would be improperly aligned against the risks, and would needlessly drive costs up without commensurate reduction in utility wildfire risk.

This data leverages the materials assessed above, and aggregates them into the proscribed ignition probability drivers; the analysis, underlying data sources and assumptions are further discussed in 3.4.3.

Table 11: Key recent drivers of ignition probability, transmission lines, last 5 years

Incident Type by ignition probability driver		Near misses tracked [y/n]	Number of incidents per year						Average percentage probability of ignition per incident						Number of ignitions per year from this driver					
			2015	2016	2017	2018	2019	Average	2015	2016	2017	2018	2019	Average	2015	2016	2017	2018	2019	Average
Contact from object	Animal contact	n	3	0	0	2	1	1	0%	0%	0%	0%	100%	17%	0	0	0	0	1	0
	Balloon contact	n	0	0	0	0	0	0	0%	0%	0%	0%	0%	0%	0	0	0	0	0	0
	Other	n	18	3	11	2	2	7	0%	0%	0%	0%	0%	0%	0	0	0	0	0	0
	Unknown	n	0	1	0	1	0	0	0%	0%	0%	0%	0%	0%	0	0	0	0	0	0
	Veg. contact	n	5	1	5	1	7	4	0%	0%	0%	0%	0%	0%	0	0	0	0	0	0
	Vehicle contact	n	1	0	0	1	0	0	0%	0%	0%	0%	0%	0%	0	0	0	0	0	0
Contamination		n	1	2	1	3	2	2	0%	0%	0%	0%	0%	0%	0	0	0	0	0	0
All types of Equipment / Facility failure	Conductor	n	3	6	1	0	1	2	0%	0%	0%	0%	0%	0%	0	0	0	0	0	0
	Crossarm	n	0	0	0	0	0	0	0%	0%	0%	0%	0%	0%	0	0	0	0	0	0
	Fuse	n	0	0	0	0	0	0	0%	0%	0%	0%	0%	0%	0	0	0	0	0	0
	Insulator	n	0	0	0	0	0	0	0%	0%	0%	0%	0%	0%	0	0	0	0	0	0
	Lightning arrester	n	0	0	0	0	0	0	0%	0%	0%	0%	0%	0%	0	0	0	0	0	0
	Other	n	2	0	1	4	0	1	0%	0%	0%	0%	0%	0%	0	0	0	0	0	0
	Pole	n	0	0	0	0	0	0	0%	0%	0%	0%	0%	0%	0	0	0	0	0	0
	Sectionalizer	n	0	0	0	0	0	0	0%	0%	0%	0%	0%	0%	0	0	0	0	0	0

Incident Type by ignition probability driver		Near misses tracked [y/n]	Number of incidents per year						Average percentage probability of ignition per incident						Number of ignitions per year from this driver					
			2015	2016	2017	2018	2019	Average	2015	2016	2017	2018	2019	Average	2015	2016	2017	2018	2019	Average
	Splice/clamp/connector	n	0	0	0	0	1	0	0%	0%	0%	0%	100%	100%	0	0	0	0	1	0
	Switch	n	0	0	0	0	0	0	0%	0%	0%	0%	0%	0%	0	0	0	0	0	0
	Transformer	n	0	0	0	0	0	0	0%	0%	0%	0%	0%	0%	0	0	0	0	0	0
	Voltage regulator	n	0	0	0	0	0	0	0%	0%	0%	0%	0%	0%	0	0	0	0	0	0
Normal Operation		n	3	2	1	1	0	1	0%	0%	0%	0%	0%	0%	0	0	0	0	0	0
Other		n	17	7	24	10	8	13	0%	0%	0%	0%	0%	0%	0	0	0	0	0	0
Unknown		n	32	12	19	17	30	22	0%	0%	0%	0%	0%	0%	0	0	0	0	0	0
Vandalism/Theft		n	0	0	0	0	0	0	0%	0%	0%	0%	0%	0%	0	0	0	0	0	0
Wire-to-wire contact		n	2	0	0	0	0	0	0%	0%	0%	0%	0%	0%	0	0	0	0	0	0
Contact from 3rd party		n	1	0	0	0	1	0	0%	0%	0%	0%	0%	0%	0	0	0	0	0	0

Table 11b: Key recent drivers of ignition probability, distribution lines, last 5 years²⁰

Incident Type by ignition probability driver		Near misses tracked [Y/n]	Number of incidents per year						Average percentage probability of ignition per incident						Number of ignitions per year from this driver					
			2015	2016	2017	2018	2019	Average	2015	2016	2017	2018	2019	Average	2015	2016	2017	2018	2019	Average
Contact from object	Animal contact	n	55	32	34	42	53	43	2%	0%	0%	2%	2%	1%	1	0	0	1	1	1
	Balloon contact	n	2	0	0	1	0	1	0%	0%	0%	0%	0%	0%	0	0	0	0	0	0
	Other	n	88	23	32	34	37	43	0%	0%	0%	0%	0%	0%	0	0	0	0	0	0
	Unknown	n	0	4	5	4	1	3	0%	0%	0%	0%	0%	0%	0	0	0	0	0	0
	Veg. contact	n	127	118	159	79	174	131	0%	1%	1%	3%	1%	1%	0	1	1	2	2	1
	Vehicle contact	n	15	9	11	18	9	12	0%	0%	0%	6%	0%	2%	0	0	0	1	0	0
Contamination		n	4	2	5	6	2	4	0%	0%	0%	0%	0%	0%	0	0	0	0	0	0
All typed of Equipment / Facility failure	Conductor	n	43	29	39	25	27	33	2%	0%	3%	0%	4%	2%	1	0	1	0	1	1
	Crossarm	n	5	4	3	2	7	4	0%	0%	0%	0%	14%	5%	0	0	0	0	1	0
	Fuse	n	122	130	156	127	118	131	0%	0%	1%	0%	1%	0%	0	0	1	0	1	0
	Insulator	n	3	5	2	5	6	4	0%	0%	0%	0%	0%	0%	0	0	0	0	0	0
	Lightning arrestor	n	10	12	13	14	8	11	0%	0%	0%	0%	0%	0%	0	0	0	0	0	0
	Other	n	13	10	19	35	32	22	0%	0%	0%	0%	0%	0%	0	0	0	0	0	0
	Pole	n	4	5	8	3	9	6	0%	0%	0%	0%	0%	0%	0	0	0	0	0	0
	Sectionalizer	n	0	1	0	0	0	0	0%	0%	0%	0%	0%	0%	0	0	0	0	0	0
	Splice/clamp /connector	n	137	60	100	41	71	82	0%	2%	0%	0%	0%	0%	0	1	0	0	0	0
	Switch	n	0	1	1	0	0	0	0%	0%	0%	0%	0%	0%	0	0	0	0	0	0
	Transformer	n	61	34	54	29	48	45	0%	0%	2%	0%	0%	0%	0	0	1	0	0	0
	Voltage regulator	n	0	0	0	1	0	0	0%	0%	0%	0%	0%	0%	0	0	0	0	0	0
Normal Operation		n	31	13	19	18	27	22	0%	0%	0%	0%	0%	0%	0	0	0	0	0	0
Other		n	175	43	194	73	224	142	0%	0%	0%	0%	0%	0%	0	0	0	0	1	0

²⁰ Additional table as requested in the WMP Clarification Document from 11/15/2020 in Section 3.2 at page 12

Incident Type by ignition probability driver	Near misses tracked [y/n]	Number of incidents per year						Average percentage probability of ignition per incident						Number of ignitions per year from this driver					
		2015	2016	2017	2018	2019	Average	2015	2016	2017	2018	2019	Average	2015	2016	2017	2018	2019	Average
Unknown	n	132	116	88	85	108	106	0%	0%	0%	0%	0%	0%	0	0	0	0	0	0
Vandalism/Theft	n	1	0	1	2	0	1	0%	0%	0%	0%	0%	0%	0	0	0	0	0	0
Wire-to-wire contact	n	10	12	6	7	9	9	0%	0%	0%	0%	0%	0%	0	0	0	0	0	0
Contact from 3rd party	n	4	3	4	1	8	4	0%	0%	0%	0%	13%	5%	0	0	0	0	1	0

In addition to the tables requested above, the company also included in the tables below, PacifiCorp's recent drivers of ignition probability over the last five years during fire season. These ignition probability drivers are complementary to the above requested data set with additional granularity that allows the company to understand ignition probability drivers as specifically experienced within the company's service territory during a subset of the year when environmental conditions are more likely to escalate an ignition event to a catastrophic wildfire event. As addressed previously and supported in Figure 7, within PacifiCorp's California service territory there is substantial difference in fire risk during the winter time as compared to the summer time, which dictates segmentation of the data set.

Table 11c: Key recent drivers of ignition probability during fire season, transmission lines, last 5 years

Incident Type by ignition probability driver		Near misses tracked [Y/N]	Number of incidents per year						Average percentage probability of ignition per incident						Number of ignitions per year from this driver					
			2015	2016	2017	2018	2019	Average	2015	2016	2017	2018	2019	Average	2015	2016	2017	2018	2019	Average
Contact from object	Animal contact	n	2	0	0	2	1	1	0%	0%	0%	0%	100%	20%	0	0	0	0	1	0
	Balloon contact	n	0	0	0	0	0	0	0%	0%	0%	0%	0%	0%	0	0	0	0	0	0
	Other	n	16	2	11	0	2	6	0%	0%	0%	0%	0%	0%	0	0	0	0	0	0
	Unknown	n	0	0	0	1	0	0	0%	0%	0%	0%	0%	0%	0	0	0	0	0	0
	Veg. contact	n	2	0	2	0	0	1	0%	0%	0%	0%	0%	0%	0	0	0	0	0	0
	Vehicle contact	n	1	0	0	0	0	0	0%	0%	0%	0%	0%	0%	0	0	0	0	0	0
Contamination		n	1	2	1	3	2	2	0%	0%	0%	0%	0%	0%	0	0	0	0	0	0
All typed of Equipment / Facility failure	Conductor	n	1	0	0	0	0	0	0%	0%	0%	0%	0%	0%	0	0	0	0	0	0
	Crossarm	n	0	0	0	0	0	0	0%	0%	0%	0%	0%	0%	0	0	0	0	0	0
	Fuse	n	0	0	0	0	0	0	0%	0%	0%	0%	0%	0%	0	0	0	0	0	0
	Insulator	n	0	0	0	0	0	0	0%	0%	0%	0%	0%	0%	0	0	0	0	0	0
	Lightning arrestor	n	0	0	0	0	0	0	0%	0%	0%	0%	0%	0%	0	0	0	0	0	0
	Other	n	0	0	0	0	0	0	0%	0%	0%	0%	0%	0%	0	0	0	0	0	0
	Pole	n	0	0	0	0	0	0	0%	0%	0%	0%	0%	0%	0	0	0	0	0	0
	Sectionalizer	n	0	0	0	0	0	0	0%	0%	0%	0%	0%	0%	0	0	0	0	0	0
	Splice/clamp /connector	n	0	0	0	0	1	0	0%	0%	0%	0%	100%	100%	0	0	0	0	1	0
	Switch	n	0	0	0	0	0	0	0%	0%	0%	0%	0%	0%	0	0	0	0	0	0

Incident Type by ignition probability driver		Near misses tracked [y/n]	Number of incidents per year						Average percentage probability of ignition per incident						Number of ignitions per year from this driver					
			2015	2016	2017	2018	2019	Average	2015	2016	2017	2018	2019	Average	2015	2016	2017	2018	2019	Average
	Transformer	n	0	0	0	0	0	0	0%	0%	0%	0%	0%	0%	0	0	0	0	0	0
	Voltage regulator	n	0	0	0	0	0	0	0%	0%	0%	0%	0%	0%	0	0	0	0	0	0
Normal Operation		n	2	0	1	0	0	1	0%	0%	0%	0%	0%	0%	0	0	0	0	0	0
Other		n	2	1	5	3	0	2	0%	0%	0%	0%	0%	0%	0	0	0	0	0	0
Unknown		n	8	0	4	6	10	6	0%	0%	0%	0%	10%	4%	0	0	0	0	1	0
Vandalism/Theft		n	0	0	0	0	0	0	0%	0%	0%	0%	0%	0%	0	0	0	0	0	0
Wire-to-wire contact		n	1	0	0	0	0	0	0%	0%	0%	0%	0%	0%	0	0	0	0	0	0
Contact from 3rd party		n	1	0	0	0	0	0	0%	0%	0%	0%	0%	0%	0	0	0	0	0	0

Table 11d: Key recent drivers of ignition probability during fire season, distribution lines, last 5 years

Incident Type by ignition probability driver		Near misses tracked [Y/n]	Number of incidents per year						Average percentage probability of ignition per incident						Number of ignitions per year from this driver					
			2015	2016	2017	2018	2019	Average	2015	2016	2017	2018	2019	Average	2015	2016	2017	2018	2019	Average
Contact from object	Animal contact	n	32	17	18	18	26	22	3%	0%	0%	6%	0%	2%	1	0	0	1	0	0
	Balloon contact	n	1	0	0	1	0	0	0%	0%	0%	0%	0%	0%	0	0	0	0	0	0
	Other	n	70	5	27	20	30	30	0%	0%	0%	0%	0%	0%	0	0	0	0	0	0
	Unknown	n	0	0	2	2	1	1	0%	0%	0%	0%	0%	0%	0	0	0	0	0	0
	Veg. contact	n	23	14	16	20	33	21	0%	0%	6%	5%	3%	3%	0	0	1	1	1	1
	Vehicle contact	n	5	4	4	10	2	5	0%	0%	0%	10%	0%	4%	0	0	0	1	0	0
Contamination		n	3	1	1	5	1	2	0%	0%	0%	0%	0%	0%	0	0	0	0	0	0
All typed of Equipment / Facility failure	Conductor	n	9	7	8	3	7	7	0%	0%	13%	0%	14%	6%	0	0	1	0	1	0
	Crossarm	n	1	2	0	0	1	1	0%	0%	0%	0%	100%	25%	0	0	0	0	1	0
	Fuse	n	34	26	52	30	41	37	0%	0%	2%	0%	2%	1%	0	0	1	0	1	0
	Insulator	n	0	1	1	2	2	1	0%	0%	0%	0%	0%	0%	0	0	0	0	0	0
	Lightning arrestor	n	5	1	3	4	5	4	0%	0%	0%	0%	0%	0%	0	0	0	0	0	0
	Other	n	5	3	4	11	6	6	0%	0%	0%	0%	0%	0%	0	0	0	0	0	0
	Pole	n	0	2	4	3	2	2	0%	0%	0%	0%	0%	0%	0	0	0	0	0	0
	Sectionalizer	n	0	0	0	0	0	0	0%	0%	0%	0%	0%	0%	0	0	0	0	0	0
	Splice/clamp /connector	n	33	11	16	10	16	17	0%	9%	0%	0%	0%	1%	0	1	0	0	0	0
	Switch	n	0	0	1	0	0	0	0%	0%	0%	0%	0%	0%	0	0	0	0	0	0
	Transformer	n	31	10	26	17	18	20	0%	0%	4%	0%	0%	1%	0	0	1	0	0	0
	Voltage regulator	n	0	0	0	0	0	0	0%	0%	0%	0%	0%	0%	0	0	0	0	0	0
Normal Operation		n	22	1	1	6	7	7	0%	0%	0%	0%	0%	0%	0	0	0	0	0	0
Other		n	6	4	3	15	13	8	0%	0%	0%	0%	8%	2%	0	0	0	0	1	0
Unknown		n	39	28	23	27	33	30	0%	0%	0%	0%	0%	0%	0	0	0	0	0	0

Incident Type by ignition probability driver	Near misses tracked [y/n]	Number of incidents per year						Average percentage probability of ignition per incident						Number of ignitions per year from this driver					
		2015	2016	2017	2018	2019	Average	2015	2016	2017	2018	2019	Average	2015	2016	2017	2018	2019	Average
Vandalism/Theft	n	0	0	0	0	0	0	0%	0%	0%	0%	0%	0%	0	0	0	0	0	0
Wire-to-wire contact	n	0	0	1	0	3	1	0%	0%	0%	0%	0%	0%	0	0	0	0	0	0
Contact from 3rd party	n	1	1	2	0	2	1	0%	0%	0%	0%	50%	17%	0	0	0	0	1	0

3.3 Recent use of PSPS, last 5 years

PacifiCorp developed its plans for PSPS in response to ESRB-8 in late 2018; it did not have such procedures in place prior to that time. In 2019, no PSPS procedures were initiated.

Table 12: Recent use of PSPS, last 5 years

PSPS characteristic	2015	2016	2017	2018	2019	Unit(s)
Frequency of PSPS events (total)	N/A	N/A	N/A	N/A	0	Number of instances where utility operating protocol requires de-energization of a circuit or portion thereof to reduce ignition probability, per year
Frequency of PSPS events (normalized)	N/A	N/A	N/A	N/A	0	Number of instances where utility operating protocol requires de-energization of a circuit or portion thereof in order to reduce ignition probability, per RFW circuit mile day per year
Scope of PSPS events (total)	N/A	N/A	N/A	N/A	0	Circuit-events, measured in number of events multiplied by number of circuits de-energized per year
Scope of PSPS events (normalized)	N/A	N/A	N/A	N/A	0	Circuit-events, measured in number of events multiplied by number of circuits targeted for de-energization per RFW circuit mile day per year
Duration of PSPS events (total)	N/A	N/A	N/A	N/A	0	Customer hours per year
Duration of PSPS events (normalized)	N/A	N/A	N/A	N/A	0	Customer hours per RFW circuit mile day per year
Other	N/A	N/A	N/A	N/A	N/A	

3.4 Baseline state of equipment and wildfire and PSPS event risk reduction plans

The following subsections include PacifiCorp's baseline state of equipment and wildfire and PSPS event risk reduction plans. Additional relevant notes or assumptions used to populate these values can be found in Section 2.7. It is critical to note that, based on the way data was prepared to meet the GIS data requested in Section 2.4 and subsequently populate the tables below, certain facilities or components may be included in multiple categories below. For example, a single linear circuit mile of transmission with distribution underbuild will be included as both a circuit mile of transmission as well as a circuit mile of distribution. Similarly, a substation that includes both transmission and distribution components, is included as a distribution substation and transmission substation below. Therefore, PacifiCorp cautions using any summation or aggregation of the categorical data reflected in the tables below to draw trends or comparisons.

In contrast to how PacifiCorp applies district level population density to characterizes the company's service territory as urban or rural consistent with the methodology and requirements found in rule 21.2 in CA General Order 95, the census data provided was extrapolated and calculated discretely for each 1 mile x 1 mile grid to classify grids as urban, rural, or highly rural as opposed to districts. Therefore, PacifiCorp cautions making any correlations between the district classifications used for compliance with CA GO 95 and the grid values presented in this document.

3.4.1 Current baseline state of service territory and utility equipment

The following table includes PacifiCorp's current baseline state of service territory and utility equipment.

Table 13: Current baseline state of service territory and utility equipment

Land use	Characteristic tracked	In non-HFTD	In HFTD Zone 1	In HFTD Tier 2	In HFTD Tier 3
In urban areas	Circuit miles	55.2	0	6.7	0
	Circuit miles in WUI	0.03	0	3.2	0
	Number of critical facilities	75	0	5	0
	Number of critical facilities in WUI	0	0	1	0
	Number of customers	4,656	0	151	0
	Number of customers in WUI	0	0	24	0
	Number of customers belonging to access and functional needs populations	6	0	0	0
	Number of customers belonging to access and functional needs populations in WUI	0	0	0	0
	Circuit miles of overhead transmission lines	2.2	0	0.7	0
	Circuit miles of overhead transmission lines in WUI	0	0	0.2	0
	Circuit miles of overhead distribution lines	32.9	0	4.6	0
	Circuit miles of overhead distribution lines in WUI	0.03	0	2.3	0

Land use	Characteristic tracked	In non-HFTD	In HFTD Zone 1	In HFTD Tier 2	In HFTD Tier 3
	Number of substations (distribution/transmission)	1/0	0/0	0/0	0/0
	Number of substations in WUI (distribution/transmission)	0/0	0/0	0/0	0/0
In rural areas	Circuit miles	1,022.6	0.7	814.6	115.9
	Circuit miles in WUI	667.1	0.5	633.2	96
	Number of critical facilities	272	0	262	33
	Number of critical facilities in WUI	100	0	156	26
	Number of customers	14,505	1	13,383	1,080
	Number of customers in WUI	6,005	1	6,610	870
	Number of customers belonging to access and functional needs populations	17	0	8	0
	Number of customers belonging to access and functional needs populations in WUI	11	0	6	0
	Circuit miles of overhead transmission lines	164.5	0.2	150.9	23.3
	Circuit miles of overhead transmission lines in WUI	127.6	0.2	116.1	15.9
	Circuit miles of overhead distribution lines	728.4	0.5	419.8	38.5
	Circuit miles of overhead distribution lines in WUI	458.5	0.3	323	29.3
	Number of substations (distribution/transmission)	14/8	0/0	9/9	1/1
	Number of substations in WUI (distribution/transmission)	5/4	0/0	7/9	1/0
In highly rural areas	Circuit miles	1,231.6	6.1	614.2	0
	Circuit miles in WUI	498.4	5.3	429.4	0
	Number of critical facilities	198	0	139	0
	Number of critical facilities in WUI	64	0	111	0
	Number of customers	7,663	14	4577	0
	Number of customers in WUI	2,841	13	3,965	0
	Number of customers belonging to access and functional needs populations	7	0	2	0
	Number of customers belonging to access and functional needs populations in WUI	1	0	2	0
	Circuit miles of overhead transmission lines	217.3	1	169.3	0
	Circuit miles of overhead transmission lines in WUI	90.1	0.6	77.5	0
	Circuit miles of overhead distribution lines	937.9	4.8	356.7	0
	Circuit miles of overhead distribution lines in WUI	378	4.4	275.6	0
	Number of substations (distribution/transmission)	15/21	0/0	12/2	0/0
	Number of substations in WUI (distribution/transmission)	4/2	0/0	8/1	0/0

The following table includes PacifiCorp's current summary data on weather station count. PacifiCorp installed 10 weather stations in its Northern California service territory. Collectively, this weather station network is comprised of various weather instrumentation strategically installed in areas of significant concern with respect to strong wind events and rapid wildfire spread potential. The weather station network leverages applications performed previously by San Diego Gas & Electric (SDG&E). Due to northern California's wetter climate and shorter fire season, PacifiCorp augmented their weather station network with tipping bucket rain gauges at all locations and fuel moisture probes at approximately half of its locations. This contributes additional data regarding combustion potential of vegetation with respect to recent precipitation events.

In addition to this supplemental data, every weather station collects temperature, relative humidity, dew point and wind speed and direction, as well as maximum wind gusts during each collection period. Fire weather indices such as the Fosberg Fire Weather Index (FFWI) and the Keetch-Byram Drought Index (KBDI) are calculated by each data logger to provide additional information pertaining to wildfire risk. This data is continuously monitored by internal data loggers and collected on ten-minute intervals before it is transmitted to a central repository cloud database (which is critical for forecast operations). The data is also simultaneously transmitted to MesoWest, a weather data resource housed by the University of Utah's Atmospheric Science Department, which can be viewed at mesowest.utah.edu.

The current list of stations placed by PacifiCorp can be viewed at https://mesowest.utah.edu/cgi-bin/droman/stn_owner.cgi?owner=627. The graphic below shows the placement of the recently added PacifiCorp stations.

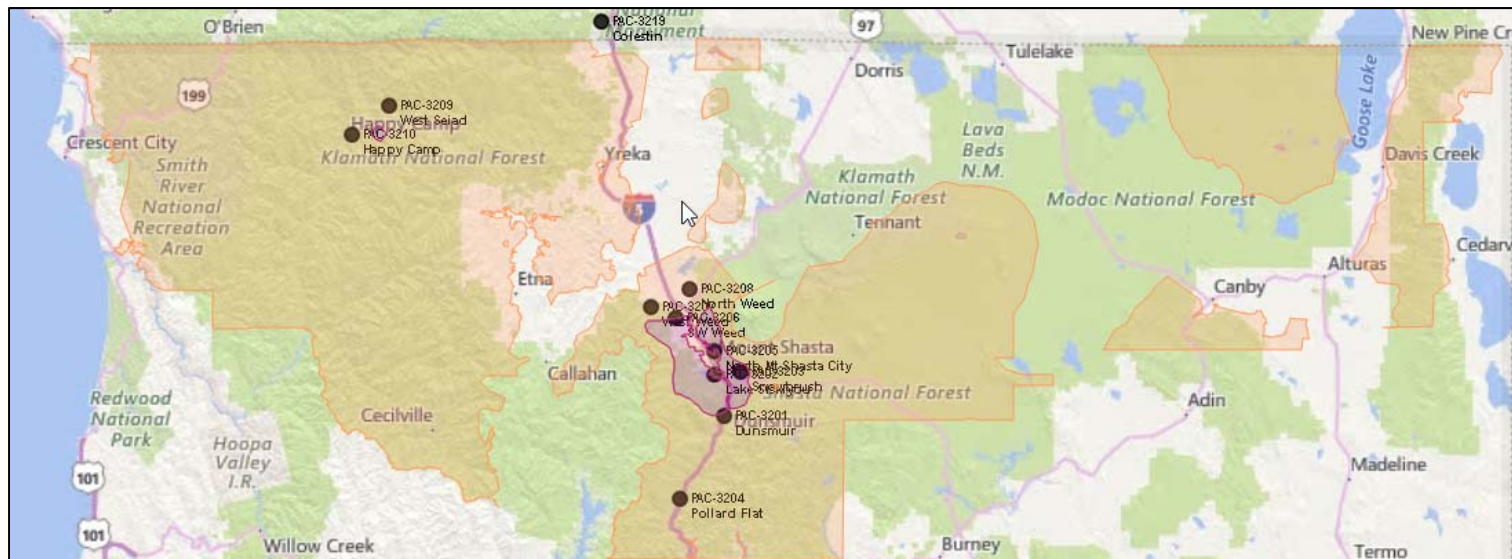


Table 14: Summary data on weather station count

Weather station count type	Current count	Unit(s)
Number of weather stations (total)	10	Total number located in service territory and operated by utility
Number of weather stations (normalized)	0.0031	Total number located in service territory and operated by utility, divided by total number of circuit miles in utility service territory
Number of weather stations in non-HFTD (total)	0.0000	Total number located in non-HFTD service territory and operated by utility
Number of weather stations in non-HFTD (normalized)	0.0000	Total number located in non-HFTD service territory and operated by utility, divided by total number of circuit miles in non-HFTD service territory
Number of weather stations in HFTD Zone 1 (total)	0.0000	Total number located in HFTD Zone 1 service territory and operated by utility
Number of weather stations in HFTD Zone 1 (normalized)	0.0000	Total number located in HFTD Zone 1 service territory and operated by utility, divided by total number of circuit miles in HFTD Zone 1 service territory
Number of weather stations in HFTD Tier 2 (total)	8	Total number located in HFTD Tier 2 service territory and operated by utility
Number of weather stations in HFTD Tier 2 (normalized)	0.0073	Total number located in HFTD Tier 2 service territory and operated by utility, divided by total number of circuit miles in HFTD Tier 2 service territory
Number of weather stations in HFTD Tier 3 (total)	2	Total number located in HFTD Tier 3 service territory and operated by utility
Number of weather stations in HFTD Tier 3 (normalized)	0.0328	Total number located in HFTD Tier 3 service territory and operated by utility, divided by total number of circuit miles in HFTD Tier 3 service territory

Table 15 below includes PacifiCorp's summary data on fault indicator count. PacifiCorp interprets the use of the term fault indicator to imply presence of device(s) able to detect and react to fault current, specifically auto-isolation points such as reclosers, fuses, circuit breakers, as well as those device(s) that can be operated locally or remotely and does not require that it can only be operated under load; this designation and these values are subsequently used to identify "modularization." Specifically excluded are jumpers. Thus, it does include switching points and isolation devices that can function as control points and be proactively operated under PSPS watch conditions.

Table 15: Summary data on fault indicator count

Fault indicator count type	Current count	Unit(s)
Number of fault indicators (total)	45,709	Total number located in service territory and operated by utility
Number of fault indicators (normalized)	13.69	Total number located in service territory and operated by utility, divided by total number of circuit miles in utility service territory
Number of fault indicators in non-HFTD (total)	22,466	Total number located in non-HFTD service territory and operated by utility
Number of fault indicators in non-HFTD (normalized)	11.35	Total number located in non-HFTD service territory and operated by utility, divided by total number of circuit miles in non-HFTD service territory
Number of fault indicators in HFTD Zone 1 (total)	46	Total number located in HFTD Zone 1 service territory and operated by utility
Number of fault indicators in HFTD Zone 1 (normalized)	6.42	Total number located in HFTD Zone 1 service territory and operated by utility, divided by total number of circuit miles in HFTD Zone 1 service territory
Number of fault indicators in HFTD Tier 2 (total)	21,312	Total number located in HFTD Tier 2 service territory and operated by utility
Number of fault indicators in HFTD Tier 2 (normalized)	17.18	Total number located in HFTD Tier 2 service territory and operated by utility, divided by total number of circuit miles in HFTD Tier 2 service territory
Number of fault indicators in HFTD Tier 3 (total)	1,886	Total number located in HFTD Tier 3 service territory and operated by utility
Number of fault indicators in HFTD Tier 3 (normalized)	17.18	Total number located in HFTD Tier 3 service territory and operated by utility, divided by total number of circuit miles in HFTD Tier 3 service territory

3.4.2 Planned additions, removal, and upgrade of utility equipment by end of 3-year plan term

Table 16 and Table 17 below include PacifiCorp’s planned additions, removals, and upgrades of utility equipment by the end of 3-year plan term. These planned changes to the system have the potential to impact the scope of the WMP and included assets.

Planned projects at the distribution level (4 kV to 34.5 kV) are derived from the regional distribution studies conducted approximately every five years as well as a complementary reliability analysis. These distribution studies include a review of historical system loading, an evaluation of projected systematic growth over a five year period, and a determination of the required system improvements to accommodate the projected load. Specific distribution system improvements may also be identified as required in customer requested system impact studies of large new load and large new generation facilities. There is one new substation being constructed in the HFTD (Tier 2) before 2022 that will utilize the latest wildfire mitigation construction standards where applicable.

Local transmission follows a similar approach to that of distribution. Planned projects at the sub-transmission level (69 to 115 kV) are derived from the regional transmission studies conducted every three to five years, which project five years of systemic load growth and describe the consequentially required transmission system improvements in detail as well as discuss the general direction proposed for longer term transmission improvement plans. Similar to distribution projects, specific transmission system improvements may also be identified as required in customer requested system impact studies of large new load and large new generation facilities.

At the main grid transmission level (115 kV and above) planned projects are primarily derived from the transmission planning assessments performed every year in accordance with the North American Electric Reliability Corporation (NERC) Standard TPL-001-4 and Western Electricity Coordinating Council (WECC) Criterion TPL-001-WECC-CRT-3.1. This assessment is comprised of the steady-state, transient stability and short circuit studies that evaluate the performance of the Bulk Electric System over a wide range of system conditions throughout the 10-year planning horizon. When the analysis identifies an inability of the system to meet the required level of performance, a corrective action plan is developed to identify transmission system improvements necessary to resolve the identified system deficiencies and ensure compliance with NERC and WECC reliability standards.

To support situational awareness, PacifiCorp established potential locations for new weather stations based upon the proactive de-energization zones outlined in its 2019 WMP. With that knowledge it engaged input from local weather professionals, specifically the Medford National Weather Service Office, to determine any “gaps” these stations could serve to fill for their purposes, while still supporting the company’s needs for proximate data. After such review, specific poles were identified and due to the need for information about “wetting” events (that could impact live fuel ignition proneness) as well as focus on dead fuel moisture, elected to install stations with tipping rain gauges, and approximately half of them with fuel moisture sensors. As the company’s information about weather patterns within the PDZs is augmented it anticipates installing additional weather stations in the Tier 2 areas in Modoc and Del Norte counties, as well as additional stations in more remote Siskiyou county, again requesting involvement from Public Safety Partners in targeting areas for their placement. The methodology above was used to

determine any potential changes to overhead transmission, overhead distribution, substations, and weather stations over a 3-year planning horizon and incorporated into both the table below as well as any applicable GIS layer included in Section 6.0.

Table 16: Location of planned utility equipment additions or removal by end of 3-yr plan

Land use	Characteristic tracked	Changes by end-2022			
		In non-HFTD	In HFTD Zone 1	In HFTD Tier 2	In HFTD Tier 3
In urban areas	Circuit miles of overhead transmission lines	0	0	0	0
	Circuit miles of overhead distribution lines	0	0	0	0
	Circuit miles of overhead transmission lines in WUI	0	0	0	0
	Circuit miles of overhead distribution lines in WUI	0	0	0	0
	Number of substations	0	0	0	0
	Number of substations in WUI	0	0	0	0
	Number of weather stations	0	0	0	0
	Number of weather stations in WUI	0	0	0	0
In rural areas	Circuit miles of overhead transmission lines	0	0	0.9	0
	Circuit miles of overhead distribution lines	0	0	0	0
	Circuit miles of overhead transmission lines in WUI	0	0	0.6	0
	Circuit miles of overhead distribution lines in WUI	0	0	0	0
	Number of substations	0	0	1	0
	Number of substations in WUI	0	0	0	0
	Number of weather stations	0	0	0	0
	Number of weather stations in WUI	0	0	0	0
In highly rural areas	Circuit miles of overhead transmission lines	0	0	0	0
	Circuit miles of overhead distribution lines	0	0	0	0
	Circuit miles of overhead transmission lines in WUI	0	0	0	0
	Circuit miles of overhead distribution lines in WUI	0	0	0	0
	Number of substations	0	0	0	0
	Number of substations in WUI	0	0	0	0
	Number of weather stations	0	0	0	0
	Number of weather stations in WUI	0	0	0	0

The following table includes the location of planned utility infrastructure upgrades, as included in PacifiCorp's 2020 WMP. This data set incorporates planned scope due to hardening initiatives including the installation of covered conductor as further described in Section 5.3.3.3 and 5.3.3.4, installation of system automation equipment as further described in Section 5.3.3.9, and the replacement of Cu conductor described in Section 5.3.3.18.

As described in Section 2.7, PacifiCorp is early in the implementation of its multi-year plan and the annual scope for each location specific program activity has only been completed for the 2020 year, including the system hardening projects contemplated in this data set. While the full scope of the multi-year programs is well understood and program dollars have been assigned in years 2021-2022 and included in Table 23 of Section 5.3.3, the specific locations and associated asset replacements have yet to be determined for each program in each year. However, PacifiCorp's location specific programs do include, as a component, the completion of more detailed scope for years beyond 2020 to be completed, where appropriate, during the 2020 calendar year which is reflected in the company's strategy included in Section 5.1. Where the annual scope has not yet been defined or specifically provided, PacifiCorp intends to follow the methodology described in Section 5 which includes systematic targeting of Tier 3 locations first followed by Tier 2, and Zone 1. Therefore, PacifiCorp has populated the table below to the extent that the information was available and complete. To review the full 2020-2022 grid design and system hardening program details, see Table 23.

PacifiCorp cautions attempts to correlate the data supplied in Table 17 to the details included Tables 23-30 or the prioritization method associated with the various programs. For example, the system automation projects are represented geospatially based on the most applicable substation location where the majority of the project scope may take place. Therefore, a system automation project prioritized and targeted to mitigate risk on a distribution circuit located within Tier 3 may appear, based on this data set, to be located within Tier 2 or Zone 1 based on the location of the associated substation. Furthermore, the units included in this table may not always correlate to the program units or tracked units as included in Table 23-30.

Table 17: Location of planned utility infrastructure upgrades

Land use	Characteristic tracked	In non-HFTD			In HFTD Zone 1			In HFTD Tier 2			In HFTD Tier 3		
		2020	2021	2022	2020	2021	2022	2020	2021	2022	2020	2021	2022
Total circuit miles planned for hardening each year, all types and locations		0			0			33.8			10.3		
Total number of substations planned for hardening each year, all locations		2			0			11			2		
In urban areas	Circuit miles planned for grid hardening of overhead transmission lines	0			0			0			0		
	Circuit miles of overhead transmission lines in WUI to harden	0			0			0			0		

Land use	Characteristic tracked	In non-HFTD			In HFTD Zone 1			In HFTD Tier 2			In HFTD Tier 3		
		2020	2021	2022	2020	2021	2022	2020	2021	2022	2020	2021	2022
	Circuit miles of overhead distribution lines to harden	0			0			0			0		
	Circuit miles of overhead distribution lines in WUI to harden	0			0			0			0		
	Circuit miles of overhead transmission lines in WUI to harden	0			0			0			0		
	Number of substations to harden	0			0			0			0		
	Number of substations in WUI to harden	0			0			0			0		
In rural areas	Circuit miles of overhead transmission lines to harden	0			0			0			0		
	Circuit miles of overhead transmission lines in WUI to harden	0			0			0			0		
	Circuit miles of overhead distribution lines to harden	0			0			31.8			10.3		
	Circuit miles of overhead distribution lines in WUI to harden	0			0			14.5			5.8		
	Circuit miles of overhead transmission lines in WUI to harden	0			0			0			0		
	Number of substations to harden	2			0			8			2		
	Number of substations in WUI to harden	0			0			7			1		
In highly rural areas	Circuit miles of overhead transmission lines to harden	0			0			0			0		
	Circuit miles of overhead transmission lines in WUI to harden	0			0			0			0		
	Circuit miles of overhead distribution lines to harden	0			0			2			0		
	Circuit miles of overhead distribution lines in WUI to harden	0			0			1			0		
	Circuit miles of overhead transmission lines in WUI to harden	0			0			0			0		
	Number of substations to harden	0			0			3			0		
	Number of substations in WUI to harden	0			0			1			0		

3.4.3 *Status quo ignition probability drivers by service territory*

PacifiCorp's primary data set for ignition probability drivers is its outage management repository, named Prosper/US. This system dates back to the early 2000s. It archives all outages and trouble calls reported by customers, public, and specific automated equipment (i.e. remote devices such as substation breakers or more recently, automated metering infrastructure). The data is interfaced into the repository from the real-time system, CADOPS, and upon completion of the outage event, within less than an hour is populated via an automated interface. Upon completion personnel identify whether the trouble call related to customer equipment, such as might result on the customer's service panel and be non-reportable, or whether the trouble call related to utility equipment and was reportable, whereupon company cause codes are used to differentiate the reason for the outage event; response personnel also provide comments that are documented as part of the permanent outage record. The outage causes, and any additional comments, were mapped to the drivers outlined below. Thus, while the Company does not explicitly use cause code balloons, it has an "Interference" cause category which is further decomposed to "Other Interfering Object" and comments generally designate the balloon involvement, allowing the outage to be associated with the ignition probability driver "Balloon contact". On the other hand, PacifiCorp's outage sub-cause designates "Car-Hit Pole", so those outages were able to be directly mapped to the ignition probability driver "Vehicle contact".

A primary assumption made relates to the location of the outage event. In PacifiCorp's outage management system all outage event details are attributed to the device where the fault event was cleared, such that if a car struck a pole several spans away from an auto isolation device (fuse, recloser, etc.), the outage event would be attributed to the fuse or recloser that "saw" that event. To the extent that circuits and device protective zones bridge across the boundaries for non-tier, Zone 1, Tier 2 and Tier 3, there may be slight inaccuracies in attribution spatially because of the precision implied by the latitude and longitude of the auto isolation point compared to where the circuit's protective zone exists.

The graphic below shows the process undertaken to map ignition drivers to outage causes. It is important to note that the outage data was developed to respond and subsequently analyze outage events and is being re-purposed through this effort to support the ignition process. As a result, certain assumptions relating to this mapping occurred. As this process matures, greater confidence in these relationships is likely to occur.

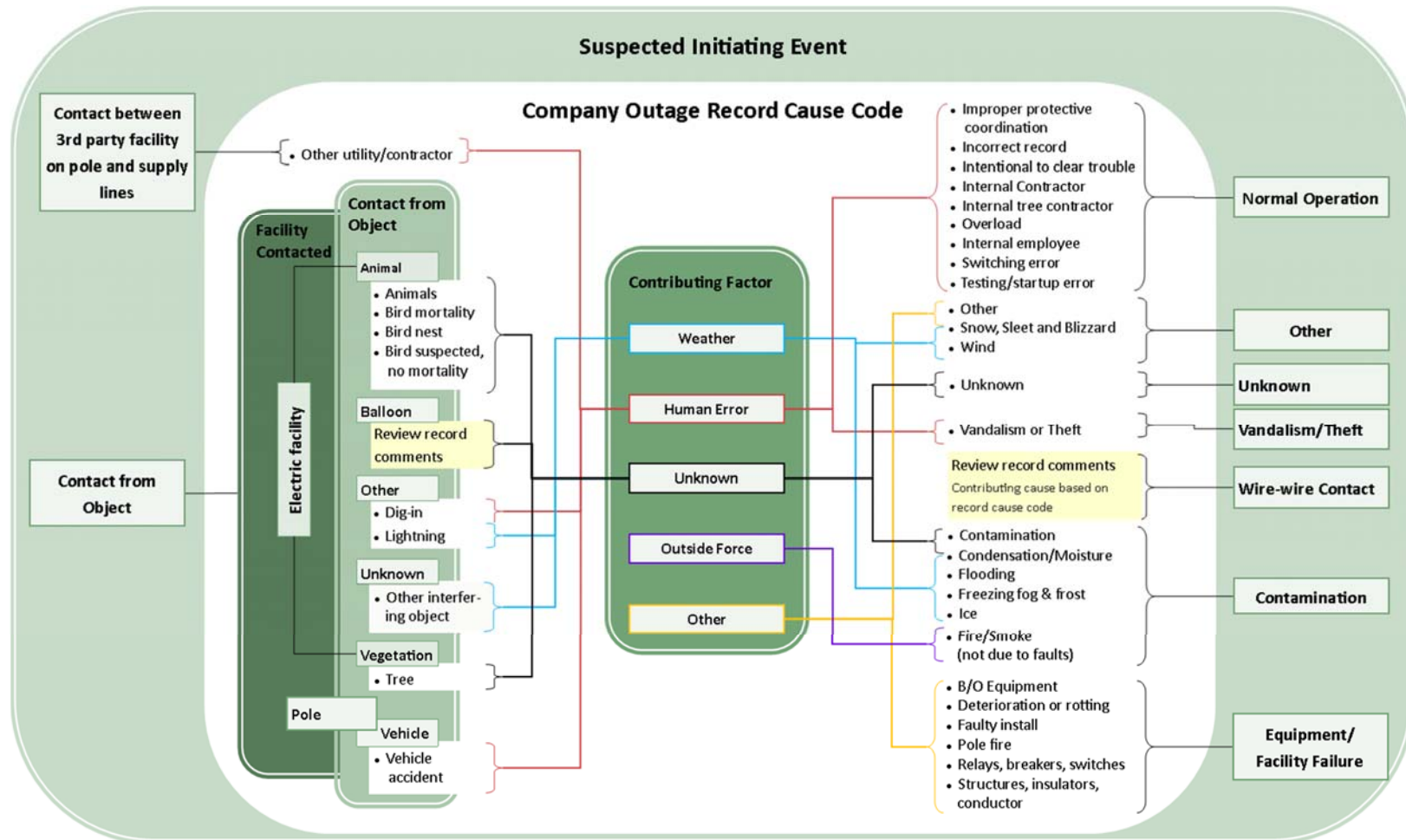


Figure 8: PacifiCorp's process to map ignition drivers to outage causes

Tables 18 a, b, c and d demonstrate incidents that have a potential risk of ignition, differentiated between distribution and transmission, categorized as either having occurred during fire season or outside of fire season.

Table 18: Key drivers of ignition probability – transmission

Incident Type by ignition probability driver		Number of incidents per year (according to 5-year Historical Average)	Average likelihood of ignition per Incident	Ignitions from this driver (according to 5-year historical average)				
				Total	In non-HFTD	In HFTD - Zone 1	In HFTD - Tier 2	In HFTD - Tier 3
Contact from object	Animal contact	1.2	16.7%	1	1	0	0	0
	Balloon contact	0.0	0.0%	0	0	0	0	0
	Other	7.2	0.0%	0	0	0	0	0
	Unknown	0.4	0.0%	0	0	0	0	0
	Veg. contact	3.8	0.0%	0	0	0	0	0
	Vehicle contact	0.4	0.0%	0	0	0	0	0
Contamination		1.8	0.0%	0	0	0	0	0
All typed of Equipment/ Facility failure	Conductor	2.2	0.0%	0	0	0	0	0
	Crossarm	0.0	0.0%	0	0	0	0	0
	Fuse	0.0	0.0%	0	0	0	0	0
	Insulator	0.0	0.0%	0	0	0	0	0
	Lightning arrestor	0.0	0.0%	0	0	0	0	0
	Other	1.4	0.0%	0	0	0	0	0
	Pole	0.0	0.0%	0	0	0	0	0
	Sectionalizer	0.0	0.0%	0	0	0	0	0
	Splice/clamp/connector	0.2	100.0%	1	0	0	1	0
	Switch	0.0	0.0%	0	0	0	0	0
	Transformer	0.0	0.0%	0	0	0	0	0
	Voltage regulator	0.0	0.0%	0	0	0	0	0
Normal Operation		1.4	0.0%	0	0	0	0	0
Other		13.2	0.0%	0	0	0	0	0
Unknown		22.0	0.9%	1	0	0	1	0
Vandalism/Theft		0.0	0.0%	0	0	0	0	0
Wire-to-wire contact		0.4	0.0%	0	0	0	0	0
Contact from 3rd party		0.4	0.0%	0	0	0	0	0

Table 18b: Key drivers of ignition probability – distribution²¹

Incident Type by ignition probability driver		Number of incidents per year (according to 5-year Historical Average)	Average likelihood of ignition per Incident	Ignitions from this driver (according to 5-year historical average)				
				Total	In non-HFTD	In HFTD - Zone 1	In HFTD - Tier 2	In HFTD - Tier 3
Contact from object	Animal contact	43.2	1.4%	3	2	0	1	0
	Balloon contact	0.6	0.0%	0	0	0	0	0
	Other	42.8	0.0%	0	0	0	0	0
	Unknown	2.8	0.0%	0	0	0	0	0
	Veg. contact	131.4	0.9%	6	3	0	3	0
	Vehicle contact	12.4	1.6%	1	1	0	0	0
Contamination		3.8	0.0%	0	0	0	0	0
All typed of Equipment/ Facility failure	Conductor	32.6	1.8%	3	2	0	1	0
	Crossarm	4.2	4.8%	1	1	0	0	0
	Fuse	130.6	0.3%	2	2	0	0	0
	Insulator	4.2	0.0%	0	0	0	0	0
	Lightning arrestor	11.4	0.0%	0	0	0	0	0
	Other	21.8	0.0%	0	0	0	0	0
	Pole	5.8	0.0%	0	0	0	0	0
	Sectionalizer	0.2	0.0%	0	0	0	0	0
	Splice/clamp/connector	81.8	0.2%	1	1	0	0	0
	Switch	0.4	0.0%	0	0	0	0	0
	Transformer	45.2	0.4%	1	1	0	0	0
	Voltage regulator	0.2	0.0%	0	0	0	0	0
Normal Operation		21.6	0.0%	0	0	0	0	0
Other		141.8	0.1%	1	1	0	0	0
Unknown		105.8	0.0%	0	0	0	0	0
Vandalism/Theft		0.8	0.0%	0	0	0	0	0
Wire-to-wire contact		8.8	0.0%	0	0	0	0	0
Contact from 3rd party		4.0	5.0%	1	0	0	1	0

²¹ Additional table as requested in the WMP Clarification Document from 11/15/2020 in Section 3.3.3 at page 12.

Similar to with Table 11 in Section 3.2, PacifiCorp also included recent drivers of ignition probability over the last five years during fire season. These ignition probability drivers are complementary to the above requested data set with additional granularity that allows the company to understand ignition probability drivers as specifically experienced within the company's service territory during a subset of the year when environmental conditions are more likely to escalate an ignition event to a catastrophic wildfire event

Table 18c: Key drivers of ignition probability during fire season - transmission

Incident Type by ignition probability driver		Number of incidents per year (according to 5-year Historical Average)	Average likelihood of ignition per Incident	Ignitions from this driver (according to 5-year historical average)				
				Total	In non-HFTD	In HFTD - Zone 1	In HFTD - Tier 2	In HFTD - Tier 3
Contact from object	Animal contact	1.0	20.0%	1	1	0	0	0
	Balloon contact	0.0	0.0%	0	0	0	0	0
	Other	6.2	0.0%	0	0	0	0	0
	Unknown	0.2	0.0%	0	0	0	0	0
	Veg. contact	0.8	0.0%	0	0	0	0	0
	Vehicle contact	0.2	0.0%	0	0	0	0	0
Contamination		1.8	0.0%	0	0	0	0	0
All typed of Equipment/ Facility failure	Conductor	0.2	0.0%	0	0	0	0	0
	Crossarm	0.0	0.0%	0	0	0	0	0
	Fuse	0.0	0.0%	0	0	0	0	0
	Insulator	0.0	0.0%	0	0	0	0	0
	Lightning arrestor	0.0	0.0%	0	0	0	0	0
	Other	0.0	0.0%	0	0	0	0	0
	Pole	0.0	0.0%	0	0	0	0	0
	Sectionalizer	0.0	0.0%	0	0	0	0	0
	Splice/clamp/connector	0.2	100.0%	1	0	0	1	0
	Switch	0.0	0.0%	0	0	0	0	0
	Transformer	0.0	0.0%	0	0	0	0	0
	Voltage regulator	0.0	0.0%	0	0	0	0	0
Normal Operation		0.6	0.0%	0	0	0	0	0
Other		2.2	0.0%	0	0	0	0	0
Unknown		5.6	3.6%	1	0	0	1	0
Vandalism/Theft		0.0	0.0%	0	0	0	0	0
Wire-to-wire contact		0.2	0.0%	0	0	0	0	0
Contact from 3rd party		0.2	0.0%	0	0	0	0	0

Table 18d: Key drivers of ignition probability during fire season - distribution

Incident Type by ignition probability driver		Number of incidents per year (according to 5-year Historical Average)	Average likelihood of ignition per Incident	Ignitions from this driver (according to 5-year historical average)				
				Total	In non-HFTD	In HFTD - Zone 1	In HFTD - Tier 2	In HFTD - Tier 3
Contact from object	Animal contact	22	1.8%	2	1	0	1	0
	Balloon contact	0	0.0%	0	0	0	0	0
	Other	30	0.0%	0	0	0	0	0
	Unknown	1	0.0%	0	0	0	0	0
	Veg. contact	21	2.8%	3	2	0	1	0
	Vehicle contact	5	4.0%	1	1	0	0	0
Contamination		2	0.0%	0	0	0	0	0
All typed of Equipment/ Facility failure	Conductor	7	5.9%	2	1	0	1	0
	Crossarm	1	25.0%	1	1	0	0	0
	Fuse	37	1.1%	2	2	0	0	0
	Insulator	1	0.0%	0	0	0	0	0
	Lightning arrestor	4	0.0%	0	0	0	0	0
	Other	6	0.0%	0	0	0	0	0
	Pole	2	0.0%	0	0	0	0	0
	Sectionalizer	0	0.0%	0	0	0	0	0
	Splice/clamp/connector	17	1.2%	1	1	0	0	0
	Switch	0	0.0%	0	0	0	0	0
	Transformer	20	1.0%	1	1	0	0	0
	Voltage regulator	0	0.0%	0	0	0	0	0
Normal Operation		7	0.0%	0	0	0	0	0
Other		8	2.4%	1	1	0	0	0
Unknown		30	0.0%	0	0	0	0	0
Vandalism/Theft		0	0.0%	0	0	0	0	0
Wire-to-wire contact		1	0.0%	0	0	0	0	0
Contact from 3rd party		1	16.7%	1	0	0	1	0

4. Inputs to the Plan and Directional Value for Wildfire Risk Exposure

4.1 The objectives of the plan

This plan details PacifiCorp's planned efforts before, during and after the 2020 fire season to construct, maintain, and operate its electrical lines and equipment in a manner to minimize the risk of catastrophic wildfire, in accordance with the requirements of PUC Section 8386(a). In evaluating which engineering, construction, and operational strategies to employ in its California service territory to minimize wildfire risks associated with electric facilities, PacifiCorp was guided by the following core concepts/premises:

- Frequency of ignition events related to electric facilities can be reduced by engineering more resilient systems that experience fewer fault events.
- When a fault event does occur, the impact of the event can be minimized using equipment and personnel to isolate the fault event.
- Systems that facilitate situational awareness and operational readiness are central to mitigating fire risk and its impacts.
- A successful plan must reflect consideration of impact on stakeholders and communities, its effect on the provision of reliable and safe electric service, and the extent to which it is commensurate with both the risks and affordability issues that are specific to PacifiCorp's service territory and customer base.

While this plan addresses all regulatory directives and requirements, the set of principles included in the plan are evolving and are subject to change. As new analysis, technologies, practices, network changes, environmental influences, or risks are identified, changes to address them may be incorporated into future iterations of the plan which is a living document. In addition, the plan integrates and interfaces with various operating policies and asset management and engineering principles which are themselves subject to change. As appropriate, the current version of documents are incorporated either as appendices to this plan or by reference.

The specific immediate, near and longer term objectives of this plan are implementing the programs included in Section 5. PacifiCorp's general approach and core concepts remain the same for any objectives to be completed before the upcoming wildfire season, before the next annual update, within the next three years, and within the next ten years. Detailed differences in the programs to be completed in those planning horizons are included in Section 5.1.1 – Section 5.1.4.

4.2 Understanding major trends impacting ignition probability and wildfire consequence

- A. *Describe how the utility monitors and accounts for the contribution of weather to ignition probability and estimated wildfire consequence in its decision-making, including describing any utility-generated Fire Potential Index or other measure (including input variables, equations, the scale or rating system, an explanation of how uncertainties are accounted for, an explanation of how this index is used to inform operational decisions, and an explanation of how trends in index ratings impact medium-term decisions such as maintenance and longer-term decisions such as capital investments, etc.).*

PacifiCorp established flexible, time-independent input variables to ensure that its fire mitigation triggers would be temporally relevant. It supported the development of this risk model by evaluating historic fires throughout Northern California over the past decade. As discussed previously, it correlated the magnitude of the acreage burned against environmental conditions and observed that generally the largest fires occurred when three specific variables were present, KBDI, FFWDI and wind gusts, at specific levels. As a result of this correlation it established thresholds and watch guidelines which inform its day-to-day activities. As conditions vary due to drought or wetting periods, this serves to alter what would have previously been considered “fire season”. On the short term basis, FFWDI and wind gusts are normal inputs to fire professionals and their response activities, thus aligning the operational functions of PacifiCorp with the public safety partners in a given area. The company expects that updating these data sets will be required as trends continue to unfold.

- B. *Describe how the utility monitors and accounts for the contribution of fuel conditions to ignition probability and estimated wildfire consequence in its decision-making, including describing any proprietary fuel condition index (or other measures tracked), the outputs of said index or other measures, and the methodology used for projecting future fuel conditions. Include discussion of measurements and units for live fuel moisture content, dead fuel moisture content, density of each fuel type, and any other variables tracked.*

PacifiCorp further recognized the significant role that fuel (e.g. vegetation) plays in sustaining ignitions, and chose to address it in two different methods. First, KBDI is theorized to provide information regarding recent and protracted wetting or drying trends which will impact live fuel. Second, PacifiCorp placed fuel moisture sensors on approximately half of its weather stations. These devices are anticipated to provide extra insight into dry fuel conditions; at this time the trends and reasonably expected values have not yet been determined, however the data will support advancement of any thresholds. In combination, these two measures inform the fuel readiness aspect of wildfire risk.

4.2.1 Service territory fire-threat evaluation and ignition risk trends

The following table includes PacifiCorp's macro trends impacting ignition probability and/or wildfire consequence.

Primary drivers to ignition probability are chiefly environmental (including drought or impacts resulting in live and dead fuel changes), population-based and the results of additional infrastructure. Further segmenting these drivers into those relating to utility ignitions narrows them further. Below is the rank ordering assessment for PacifiCorp's service area.

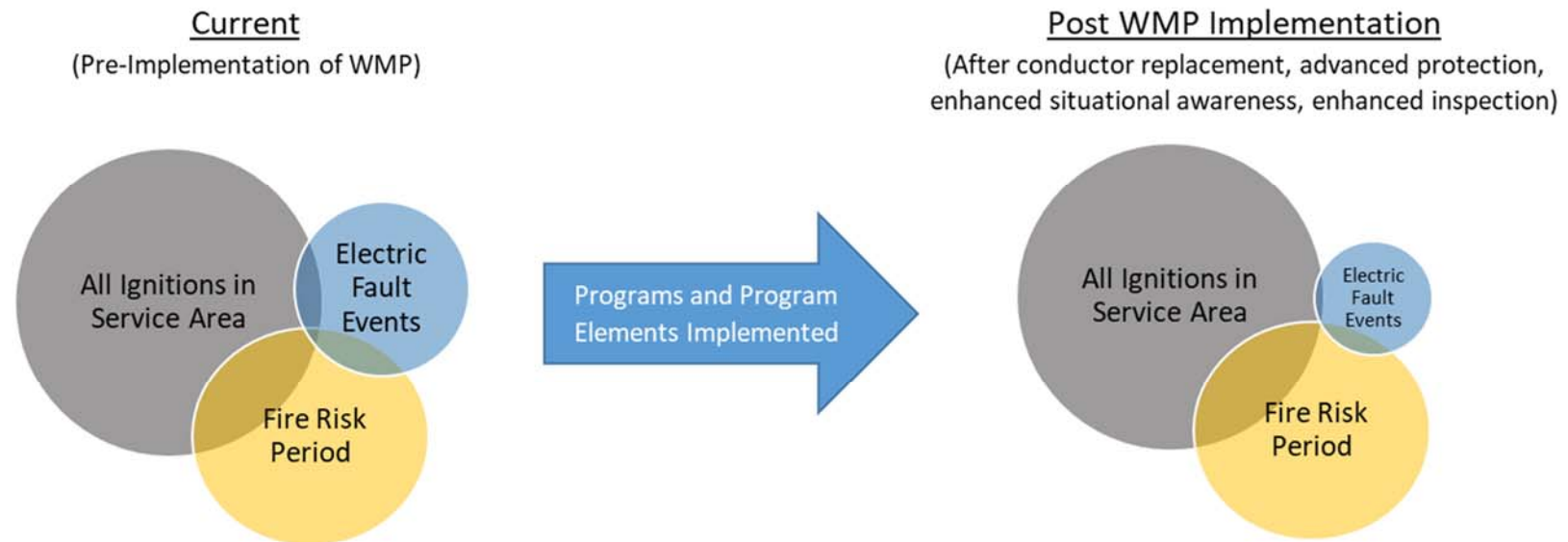
Table 19: Macro trends impacting ignition probability and/or wildfire consequence

Rank	Macro trends impacting utility ignited ignition probability and estimated wildfire consequence by year 10	Comments
1	Change in ignition probability and estimated wildfire consequence due to climate change	Reduced live and dead fuel moisture values relative to the historical baseline correlate with increased fire severity. Tree mortality may increase ignitions associated with tree line contact.
5	Change in ignition probability and estimated wildfire consequence due to relevant invasive species, such as bark beetles	Tree mortality induced by disturbances such as beetle kill may increase ignitions associated with tree line contact. The relation between tree mortality and fire behavior is not clear and remains an active research area.
2	Change in ignition probability and estimated wildfire consequence due to other drivers of change in fuel density and moisture	100+ years of fire suppression and exclusion have contributed to higher fuel loading and a shift from frequent low intensity fires that benefit the landscape to a smaller number of intense fires that have negative effects on the landscape.
7	Population changes (including Access and Functional Needs population) that could be impacted by utility ignition	This macro trend was interpreted to refer to aging population and individuals with limited mobility and/or cognitive impairments and how they could be impacted by utility-caused ignitions. Due to limited urban populations, this is not viewed as a major driver of fire consequence in PacifiCorp's service territory.
8	Population changes in HFTD that could be impacted by utility ignition	Future demographic trends in PacifiCorp's service territory are unknown, but this is not viewed as a major driver of fire consequence in PacifiCorp's service territory.
6	Population changes in WUI that could be impacted by utility ignition	Structures in Wildland Urban Interface or Intermix are more vulnerable to fire losses than those in urbanized areas. As more structures are built in WUI/Intermix areas fire losses from all causes, not just utility ignitions, may increase.

Rank	Macro trends impacting utility ignited ignition probability and estimated wildfire consequence by year 10	Comments
3	Utility infrastructure location in HFTD vs non-HFTD	As additional utility infrastructure is added to HFTD areas to serve new development, utility ignition probability may increase due to the presence of utilities in HFTD areas that previously had no utility infrastructure. However, some of this increase in ignition probability may be offset by hardened infrastructure, advanced coordination, improved real-time monitoring of circuits or other fire prevention measures such as proactive de-energization.
4	Utility infrastructure location in urban vs rural vs highly rural areas	As more structures are built in rural & highly rural areas that are connected to the grid, increased presence of utilities may in areas that previously contained no utilities may increase utility ignition probability. However, some of this increase in ignition probability may be offset by hardened infrastructure, advanced coordination, improved real-time monitoring of circuits or other fire prevention measures such as proactive de-energization.

4.3 Change in ignition probability drivers

In the visual model shown previously, ignition is the outcome of an ignition source, favorable environmental conditions and available fuel. As WMPs are implemented the utility aspect of this is expected to limit substantially the probability of an ignition source of sufficient magnitude that can result in a utility-caused ignition. The tactics discussed in the WMP include reducing the probability of ignition during those environmentally favorable times in locations where fuel loads exist. Specifically, focusing on limiting the probability of ignition sources (assumed to be related to fault events) during the fire season is expected to dramatically impact utility-caused fire risks.



4.4 Directional vision for necessary PSPS

The following section addresses the regulatory requirements of PSPS events, the methodology applied to identify candidate PSPS zones, the potential impact to customers and communities, triggers for activation, subsequent communications and protocols, as well as lessons learned from 2019 and planned evolution of the program as a whole.

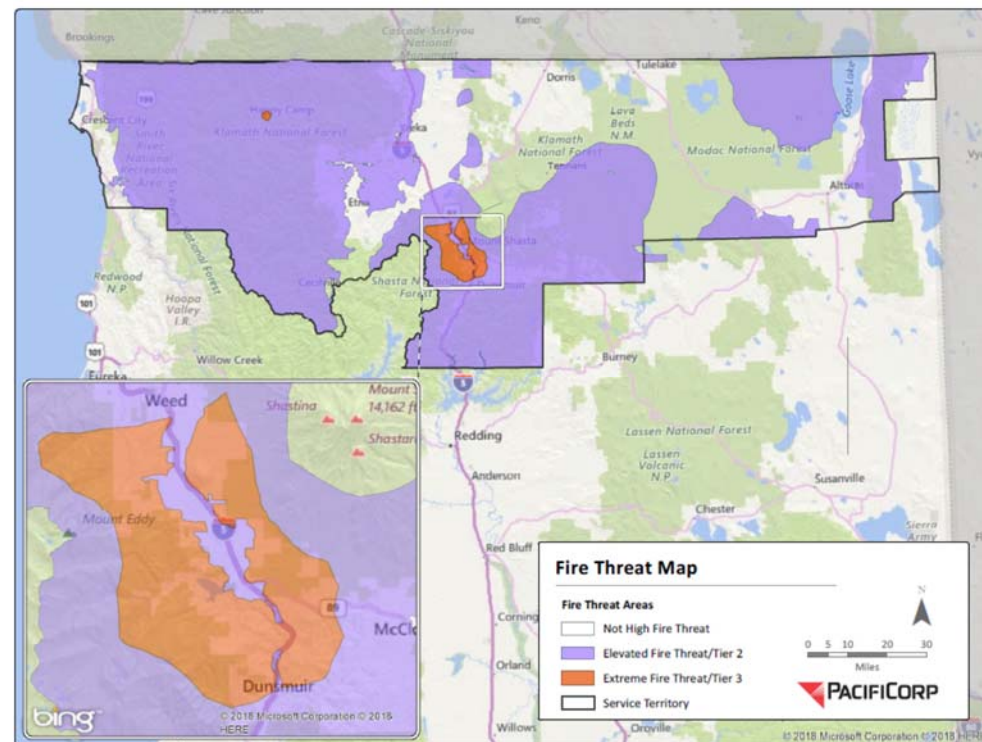
4.4.1 Methodology to Identify Candidate PSPS Zones

PacifiCorp, consistent with other California investor owned utilities, generally constrains PSPS events to Tier 3 areas and has established its plans consistent with regulatory requirements pursuant to Decision D. 12-04-024 (applicable to PacifiCorp pursuant to Resolution ESRB-8) and as adopted in the current PSPS Rulemaking, R.18-12-005. PacifiCorp has two Tier 3 areas within California, as shown in the graphic below.

A Tier 3 designation itself does not require the development of a PSPS plan, rather it identifies high threat locations requiring further evaluation to determine if a PSPS event should be considered for mitigating fire risk. This is particularly relevant in the Happy Camp area which while the Tier 3 footprint contains no overhead electric equipment, has frequent weather of a widespread nature which could result in impacts to the community.

Nor must the PSPS zone be fully contained within the Tier 3 area; the shape instead is a result of similar risk levels given the weather history and other environmental factors in combination with associated electrical equipment in the area.

PacifiCorp reviewed fire threat, terrain, fire history, fuel characteristics and weather in determining the company's PSPS zones. It also considered wildland urban interface, defensible space, impacts to customers and facilities to establish its proactive de-energization zones. Additional details can be found in Annex A of the company's California Proactive De-Energization Plan.

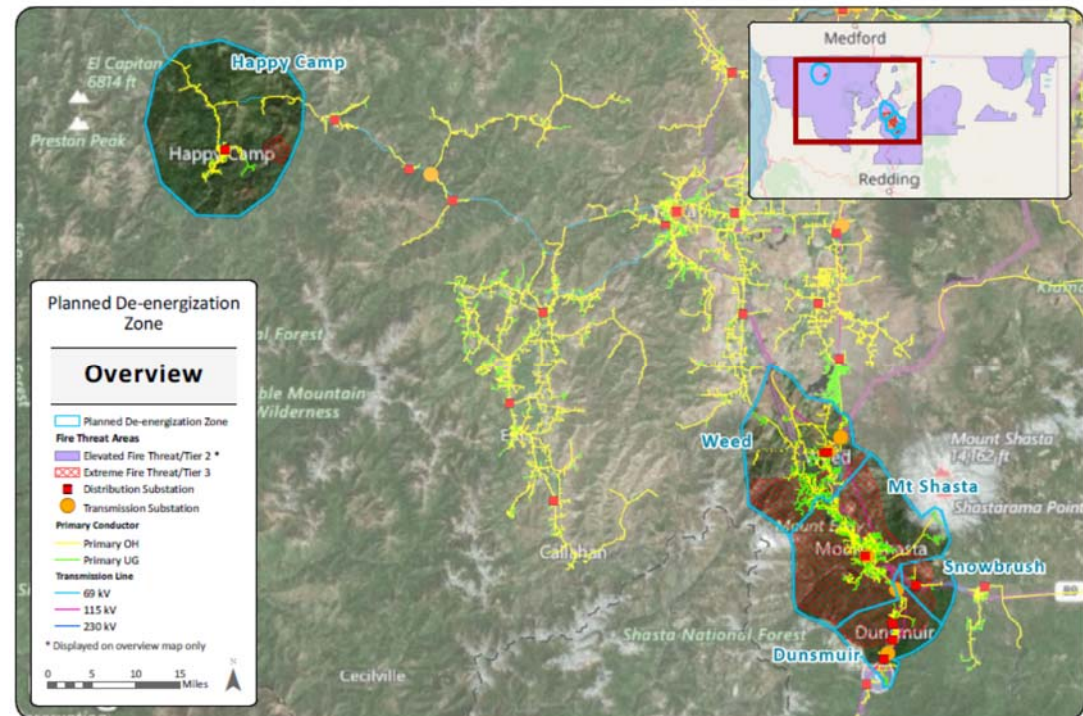


4.4.2 PSPS Zones & Potential Impact to Customers

PacifiCorp, through its review, identified two primary zones where a PSPS event might be applicable in its California service territory. The two primary zones were further subdivided into smaller areas (shown outlined in the graphic) minimizing customer impact where appropriate based on weather monitoring capability and circuit topology. This approach resulted in five discrete PSPS areas with a mix of circuit topology and customer impacts as summarized in the below table.

Approximately 20% of PacifiCorp's California customers are located or are electrically-connected to the designated Tier 3 area within its service territory. Thus, it is challenging to mitigate the impacts of PSPS, until sufficient hardening efforts have been delivered to minimize the ignition risk during environmentally favorable periods described in Section 5.3.3.

However, as included in Section 5.3.3.8, PacifiCorp continues to evaluate opportunities within the company's pre-defined PSPS zones where projects can promote flexibility, enhance quality and quantity of localized data to inform decision making, and mitigate the impact of potential PSPS events. At this time, the following table includes the five discrete zones and potential customer impact associated with a PSPS events.



	PSPS Name	Substation	# of Circuits	Customers	Distribution OH	Distribution UG
1	Happy Camp	Seiad, Happy Camp	3	865	48.4	5.9
2	Weed	Weed, International Paper	5	2,589	90.5	62.1
3	Mt. Shasta	Mt. Shasta	6	5,074	86.4	76.7
4	Dunsuir	North & South Dunsuir	5	1,806	30.0	8.6
5	Snowbrush	Snowbrush	1	17	4.2	1.2
	Total	9 Substations	20	10,351	259.5	154.5

4.4.3 Criteria for PSPS

To successfully identify, activate, and implement a PSPS event within PacifiCorp's service territory in California, the company monitors weather information from the PSPS areas, uses a list of pre-determined and measurable triggers for activation of a watch event, incorporates additional local knowledge and data to potentially activate a PSPS event, and then facilitates continuous monitoring of system conditions to determine when elevated risk conditions subside.

The main process outline is summarized below.

- 1) PacifiCorp utilizes automated weather systems monitoring to generate an internal notification based on the criteria, and a potential PSPS activation is triggered.
- 2) When a potential activation is triggered a Public Safety Power Shutoff Event Proposal is prepared and provided to the Vice President of System Operations and the Vice President of T&D Operations which contains the timing details, area, and forecasted duration of the event.
- 3) The Vice President of System Operations and the Vice President of T&D Operations evaluate all relevant information as described in the following subsections, including input from public safety partners to properly characterize and consider impacts to local communities.
- 4) The Vice President of System Operations and the Vice President of T&D Operations decide whether to implement a PSPS event.
- 5) If activated, the company's notification and activation protocols are followed, including activation of the company's emergency management system and customer/public notifications.
- 6) Conditions are continuously monitored during the PSPS event and when elevated risk conditions no longer exist, lines are patrolled for damage, and re-energized, ending the PSPS event.

Criteria Inputs

Building upon work completed in developing the California state-wide fire map in D. 17-12-024, PacifiCorp utilized weather data, geographic topography, fire probability and ignition data and historic fire data to determine the criteria for triggering proactive de-energization in each of the five PSPS area. While the primary triggers are the same – meaning that a candidate event will be identified based on the same thresholds – it is expected that localized topography and weather conditions will be evaluated in real time prior to making a determination to de-energize any power lines; by using microclimatology information, there may be an opportunity for de-energizing smaller areas at a time. For these reasons, it will be rare for proactive de-energization to be simultaneously activated in multiple areas. PacifiCorp uses the following measurements as inputs to the PSPS watch criteria.

- Hourly Fosberg Fire Weather Index (FFWI) which uses temperature, relative humidity, 10-minute wind-speed factored into a single weather index which is correlated to influence on fire spread, accumulated over a 6 hour period (FFWI6).

- The Keetch-Byram Drought Index (KBDI) which assesses the risk of fire by representing the net effect of evapotranspiration and precipitation in producing cumulative moisture deficiency.
- Forecasted wind speeds and potential sustained gusts.

An automatic notification is triggered internally for specific PSPS areas based on a forecast of the above measurements meeting the following levels:²²

PSPS Watch Level 1	PSPS Watch Level 2
<ul style="list-style-type: none"> • KBDI ≥ 622 <u>and</u> • FFWI6 ≥ 30 <u>and</u> • Sustained wind ≥ 16 mph <u>or</u> • Wind gust ≥ 25 mph 	<ul style="list-style-type: none"> • KBDI ≥ 622 <u>and</u> • FFWI6 ≥ 30 <u>and</u> • Wind gust > 31 mph

While these general values are used to identify PSPS watch conditions, localized criteria and up to date information are incorporated when a determination is made to implement an actual PSPS event as described in the following subsection.

Criteria to Activate

After the first notification is delivered, PacifiCorp actively monitors weather conditions and endeavors to provide customers with additional notifications. During this time PacifiCorp begins actively engaging Public Safety Partners to ensure any relevant input is incorporated from these professionals. When Watch Level 2 levels are forecasted (or measured in actual conditions), PacifiCorp's Emergency Operation Center (EOC) is activated. The Watch Level 2 forecast is confirmed and continuously monitored throughout the potential PSPS event. Customer lists in the subject PSPS area are assembled, and a communication plan is implemented according to the details in Section 4.4.3. PacifiCorp also deploys additional resources in the subject PSPS area to monitor local environmental and asset conditions on the ground in real time.

Based on all of the information available to the EOC, the EOC Director, which under normal operation conditions will be the Vice President of T&D Operations, may make a decision to implement a PSPS. In general, barring other unique circumstances, a PSPS would not be implemented unless Watch Level 2 conditions are extremely likely in forecasted weather conditions. At the same time, realization of Watch Level 2 conditions does not necessarily mean that a PSPS is warranted. The EOC Director will consider all available information, including real time feedback from other EOC participants, local field input, recent fire activity, and other pertinent information provided by local emergency management professionals to determine whether PSPS is appropriate. As a matter of practical reality, the EOC Director cannot know if a PSPS will prevent a utility related ignition or not. If a PSPS is not implemented and an ignition occurs, the ignition itself is not proof that a PSPS should have been implemented. Likewise, if a PSPS is implemented, the event itself does not prove that an ignition which would have otherwise occurred was prevented.

²² While Red Flag Warnings provide the public awareness of heightened fire risk conditions and are considered by PacifiCorp when evaluating any candidate event, such warning do not sufficiently correlate to warrant inclusion as a key input to activation of the proactive de-energization process.

4.4.4 Communication Plan & Protocols

In the event of PSPS activation, identified personnel will receive an email notification from System Operations. The email will include the current or forecasted weather conditions triggering an event, the affected area, and the date and time of the event. The goal is to begin notifying customers 48 hours in advance of a potential PSPS event. If this is not possible due to weather or any other changing conditions, the notification process will begin as soon as possible.

Customer Communications

- The list of affected customers (generated by System Operations from the impacted circuits noted in the De-Energization Event Plan) is sent to the Customer Contact Center
- Using this list, the contact center will begin sending notifications utilizing preapproved templates for each state of the notification process.

During the PSPS event, customers will receive updates to the status of the outage. The trigger for an update will be when the status of the outage or the estimated time of restoration changes. If a previously noticed proactive de-energization event is cancelled, customers will receive a cancellation notice.

Method of Notification

- Customers will be contacted by text, email, or phone call based on their preference. If no preference is selected, a phone call will be made to the primary phone number on the account.
- Notifications for a proactive de-energization event are exempted from the 48 hour notification prior to a planned outage as required under Rule 25 under both the Force Majeure and Safety clauses listed under approved exemptions.
- Messages will be posted on social media, local media, and press release.

Timeframe for Communications	Type of Notification	Customer Service/Communications
48 hours before De-Energization	Conditional	48 hour notice to customers (including critical priority customers) Emergency response site goes live Notification posted on website, Social Media and emergency response site Mobilize local authorities for a live stream on Facebook

Timeframe for Communications	Type of Notification	Customer Service/Communications
		Issue a press statement/release Mandatory manager call for local employees impacted
2 hours	Updated Conditional	2 hour notice to customers (including critical priority customers) Notification posted on website, Social Media and emergency response site Mobilize local authorities for a live stream on Facebook Issue a press statement/release Mandatory manager call for local employees impacted
1 hour	Imminent	Mobilize local authorities for a live stream on Facebook Mandatory manager call for local employees impacted
De-Energization	Immediate	Notification posted on website, Social Media and emergency response site Mobilize local authorities for a live stream on Facebook Issue a press statement/release
Re-Energization	Immediate	Notice of cancellation customers (including critical priority customers) Notification posted on website, Social Media and emergency response site Issue a press statement/release

Outreach in Advance of the Implementation of a Public Safety Power Shut-Off

PacifiCorp provides information regarding proactive de-energization on the public website, including the following:

- Actions taken to harden the system to reduce risk,
- Monitoring conditions,
- Criteria for triggering a PSPS event,
- Map of tiers in California,
- Notification before, during, and at the conclusion on an event,
- Restoration information,
- PSPS candidate zones,
- PSPS zone status and forecasting leading up to and during a PSPS event, and
- Available community resources.

Additionally, PacifiCorp intends to communicate through additional methods such as social media, twitter, Facebook, pamphlets, and radio as described above as well as Section 5.3.10.1.

Access and Functional Needs Customers

Known vulnerable customers (medical conditions, etc.) will receive additional outreach from the company requesting they evaluate the safety of their situations and consider a back-up plan in case of a shut off or any emergency outage. PacifiCorp also refers to these customers as AFN, or access and functional needs customers, identified through the process described in Section 2.7.

Public Safety Authorities, Local Municipalities, Emergency Responders

The company's Emergency Manager will notify the appropriate local agencies based on the PSPS zone that was activated. PacifiCorp will work with agencies to minimize the impact of de-energization as much as possible and fully communicate the impacted areas and expected duration. The notification will be documented for reporting purposes after the event has ended.

4.4.5 Operations Response and Management

The following describes the company's PSPS operations response and management requirements in addition to those included in the company's Emergency Response Plans, and described in Section 5.3.9, such as pre-staging of additional resources.

Local Operational Response

Upon notification of a potential proactive de-energization event local operations will secure appropriate resources for required switching, restoration line patrolling, and response to public requests. In each PSPS plan, specific resource estimates have been provided. Further, in each of these plans switching has been identified that can aid in the quicker restoration of priority customers while patrolling continues on the remaining portions of the circuit.

After-Action Reporting/Plan Updates

As outlined in D. 12-04-024 and ESRB-8 there are reporting requirements following a proactive de-energization event. The forms and logs listed in Annex B of the company's California Proactive De-Energization Plan will be used to document required information throughout an event. In addition an annual refresh of the proactive de-energization process and documentation will be conducted and any necessary updates to the plan documented.

4.4.6 Lessons Learned

While PacifiCorp did not implement a PSPS event in the state of California during the 2019 fire season, PacifiCorp did remain vigilant and monitor elevated risk conditions throughout the year when required to maintain the ability to implement a PSPS event. During these time periods, PacifiCorp learned that the ability to efficiently and effectively implement a PSPS event within the company's service territory in a manner that keeps the impact to customers and communities as low as practical, is about flexibility, system knowledge, and the ability to make informed decisions to task appropriate action in the moment.

PacifiCorp has incorporated these lessons learned into the company's grid design and system hardening wildfire mitigation program focused on grid topology improvements to mitigate or reduce PSPS events. Further described in Section 5.3.3.8, 2019 represents the first year of PacifiCorp's PSPS program, and, therefore, the company does not yet have a defined list of mitigation projects. However, moving forward, PacifiCorp's grid topology improvements to mitigate or reduce PSPS events will focus on the evaluation of various scenarios within the company's pre-defined PSPS zones to understand what projects may be able to promote this flexibility. In some cases, these projects may include proactive installation of equipment. However, as weather patterns and risk can change quickly, specific proactive projects may not always be effective and the company may look at enhanced procedures and readiness to implement reactive switching or isolation points during an event.

4.4.7 *Planned Evolution*

Approximately 20% of PacifiCorp's California customers are located or are electrically-connected to the designated Tier 3 area within its service territory. Thus, it is challenging to mitigate the impacts of PSPS, until sufficient hardening efforts have been delivered to minimize the ignition risk during environmentally favorable periods described in Section 5.3.3.

Therefore, PacifiCorp anticipates that further implementation of system hardening programs can substantially reduce the need and impact of PSPS events and will, most likely, require that PacifiCorp's PSPS programs reflect a reduction in potential candidate zones, amendment to threshold criteria, and, where appropriate, removal of a PSPS zone entirely.

Additionally, as PacifiCorp continues to install and leverage data from local weather stations to facilitate informed decision making and enhanced situational awareness, the company may need to incorporate this new information into existing PSPS protocols. However, it is unknown at this time exactly how enhanced situational awareness and localized data will affect PacifiCorp's PSPS protocols. For example, discreet, localized values could enhance decision making and allow PacifiCorp to use real time conditions to initiate or terminate a PSPS event. This information may also demonstrate that localized effects and weather patterns reflect greater risk than initially contemplated, and, therefore, require an amendment to PSPS thresholds and a potential re-evaluation of boundaries and candidate zones. Regardless, the company recognizes that this new information will need to be incorporated into both the overall assessment of risk and selection of potential candidate zones as well as the threshold criteria used to make real time decisions during times of elevated risk.

It is also critical to note that the identification of candidate PSPS zones, as described in Section 4.4.1, is dependent on fire threat, terrain, fire history, fuel characteristics and weather patterns as well as wildland urban interface, defensible space, and impacts to customers and facilities. As many of these inputs are not fixed values, such as weather, PacifiCorp recognizes that the PSPS candidate boundaries can change and anticipates that future evaluation of new data could result in an amendment or relocation of potential PSPS zones.

Similarly, as included in Sections 5.3.3, PacifiCorp's grid design and system hardening programs include focused efforts on and the prioritization work in current known PSPS, Tier 2, and Tier 3 locations. Therefore, a change to PSPS risk evaluation and boundaries may require a change in the company's approach to hardening efforts.

Therefore, PacifiCorp intends the planned evolution of the company's PSPS program and protocols to mimic the implementation of both system hardening programs as well as situational awareness programs. Furthermore, as described above in Section 4.4.6, PacifiCorp intends the evolution of the company's PSPS program and protocols to incorporate flexibility, system knowledge, and the ability to make informed decisions based on accurate information to task appropriate action in the moment.

As PacifiCorp is early in the implementation of its multi-year WMP and 2019 represents the company's first year of PacifiCorp's PSPS program, it is challenging to know exactly how the company's PSPS programs and protocols will evolve or provide specific changes to the impact on customers

and circuits. However, where possible, the following table includes PacifiCorp's approach and planned evolution of the company's PSPS program and protocols before the next annual update, within the next 3 years, and within the next 10 years.

Timeframe	PacifiCorp's Approach/Planned Evolution
Planned evolution before the next annual update	<ul style="list-style-type: none"> • Incorporation of localized weather data and enhanced situational awareness • Continued communication with stakeholders re PSPS • Outreach to ensure AFN populations are specifically identified in plans • Development of PSPS forecast webpage for customers and stakeholders
Planned Evolution within the next 3 years	<ul style="list-style-type: none"> • Continued communication with stakeholders re PSPS • Ongoing outreach to ensure AFN populations are specifically identified in plans • Refinement to PSPS forecast webpage for customers and stakeholders • Incorporation of relevant grid topology programs to mitigate the impact of a PSPS event • Evaluation of system hardening programs to include potential reduction of candidates or PSPS boundaries or amendment to threshold criteria • Incorporation of localized weather data and enhanced situational awareness to review risk profile and overall candidate selection
Planned Evolution within the next 10 years	<ul style="list-style-type: none"> • Continued communication with stakeholders re PSPS • Ongoing outreach to ensure AFN populations are specifically identified in plans • Refinement to PSPS forecast webpage for customers and stakeholders • Continued incorporation of relevant grid topology programs to mitigate the impact of a PSPS event • Evaluation of system hardening program completion to include potential reduction of candidates or PSPS boundaries, amendment to threshold criteria, and, where appropriate, removal of the PSPS zone entirely • Continued incorporation of localized weather data and enhanced situational awareness to review risk profile and overall candidate selection

The following table includes PacifiCorp’s anticipated characteristics of PSPS use over the next 10 years ranked. As PacifiCorp has not enacted a PSPS yet, the answers to these questions remain qualitative in nature as a decrease from zero is not possible. Additionally, those identified as “no change” reflect a general expectation of limited impacts due to PSPS. Furthermore, it is critical to note that many of these anticipated characteristics are interdependent, such as the PSPS scope, number of circuit miles, and number of impacted customers. Therefore, it was challenging to independently rank interdependent characteristics. In all instances below, PacifiCorp assumed a normalized value would be more impactful than a non-normalized value. Additional rationale and notes are included in the table below.

Table 20: Anticipated characteristics of PSPS use over the next 10 years

Rank order 1-9	PSPS characteristic	Significantly increase; increase; no change; decrease; significantly decrease	Comments
4	Number of customers affected by PSPS events (total)	Decrease	As PacifiCorp’s system hardening programs bias toward customer density, PacifiCorp assumes this will be the second most impactful characteristic.
3	Number of customers affected by PSPS events (normalized by fire weather, e.g., Red Flag Warning line mile days)	Decrease	
6	Frequency of PSPS events in number of instances where utility operating protocol requires de-energization of a circuit or portion thereof to reduce ignition probability (total)	Decrease	PacifiCorp assumes implementation of system hardening projects as well as situational awareness will significantly affect threshold criteria and improve the quality of information used to implement PSPS events.
5	Frequency of PSPS events in number of instances where utility operating protocol requires de-energization of a circuit or portion thereof to reduce ignition probability (normalized by fire weather, e.g., Red Flag Warning line mile days)	Decrease	
2	Scope of PSPS events in circuit-events, measured in number of events multiplied by number of circuits targeted for de-energization (total)	Significantly decrease	PacifiCorp assumes implementation of system hardening projects as well as situational awareness will significantly decrease the scope of potential future PSPS event.
1	Scope of PSPS events in circuit-events, measured in number of events multiplied by number of circuits targeted for de-energization (normalized by fire weather, e.g.,	Significantly decrease	
8	Duration of PSPS events in customer hours (total)	Decrease	PacifiCorp assumes implementation of system hardening projects as well as situational awareness will significantly affect threshold criteria and improve the quality of information used to implement PSPS events, including the decision to end a PSPS event affecting duration.
7	Duration of PSPS events in customer hours (normalized by fire weather, e.g., Red Flag Warning line mile days)	Decrease	
N/A	Other	N/A	N/A

5. Wildfire Mitigation Strategy and Programs for 2019 and for each year of the 3-year WMP term

The following subsections include PacifiCorp's strategy and programs for 2019 and for each year of the 3-year WMP term, including a discussion on the company's general approach, summary of 2019 progress and lessons learned, identification of resource limitations and challenges, and description of how the utility expects new technologies and innovations to impact the utility's strategy and implementation approach over the next 3 years

- A. Discuss the utility's approach to determining how to manage wildfire risk (in terms of ignition probability and estimated wildfire consequence) as distinct from managing risks to safety and/or reliability. Describe how this determination is made for both (1) the types of activities needed and (2) the extent of those activities needed to mitigate these two different groups of risks.*

PacifiCorp uses a combination of lessons learned from other utilities, general guidance from Commission-led initiatives, and engineering and operational best practices to determine a general approach to manage wildfire risk. PacifiCorp has extensive experience implementing existing programs, which target safety or reliability risk mitigation, to set a foundation and provide guidance into best practices for the design, implementation, and continuous improvement of a program. As a result, many of the company's wildfire mitigation programs are simply an extension or augmentation of scope to existing programs, such as inspection and correction programs. Where needed, new programs or activities are identified, designed and implemented such as installation of covered conductor.

In either case, to determine the types of activities needed and the extent that those activities are needed to mitigate wildfire risk as opposed to risks to safety and/or reliability, PacifiCorp relies on a combination of the core concepts included in Section 4.1 along with historical data, sound engineering judgement, and documented ignition probability drivers.

Historic ignition data, as available from CALFIRE data sources, along with engineering judgement and operations knowledge indicate where and why historic ignitions have occurred. PacifiCorp's outage records, which document the frequency, duration, and cause of outages experienced on energized circuits, are often used to describe ignition probability drivers and represent the most accurate depiction of how often potential ignition events may occur within the company's service territory. These core concepts provide guidance into the development of a program and include targeting a reduction in ignition probability associated with fault events, mitigation of impact should a fault event occur, and integration of systems that facilitate situational awareness to inform decision making and operational readiness while limiting the impact on stakeholders and communities.

PacifiCorp uses the historic ignition data and outage records in combination with the core concepts to develop the company's wildfire mitigation programs, which may include implementation of new technology, operational practices and procedures, engineering standards, or a combination of all of the above.

- B. Include a summary of what major investments and implementation of wildfire mitigation initiatives achieved over the past year, and any lessons learned, any changes circumstances for the 2020 WMP term (i.e. 2020-2022), and any corresponding adjustment in priorities for the upcoming plan term.

In 2019, PacifiCorp was able to materially deliver its 2019 WMP despite start-up efforts and resource constraints as described further in part C of Section 5.0. The following graphic reflects PacifiCorp's previously reported progress on 2019 WMP efforts.

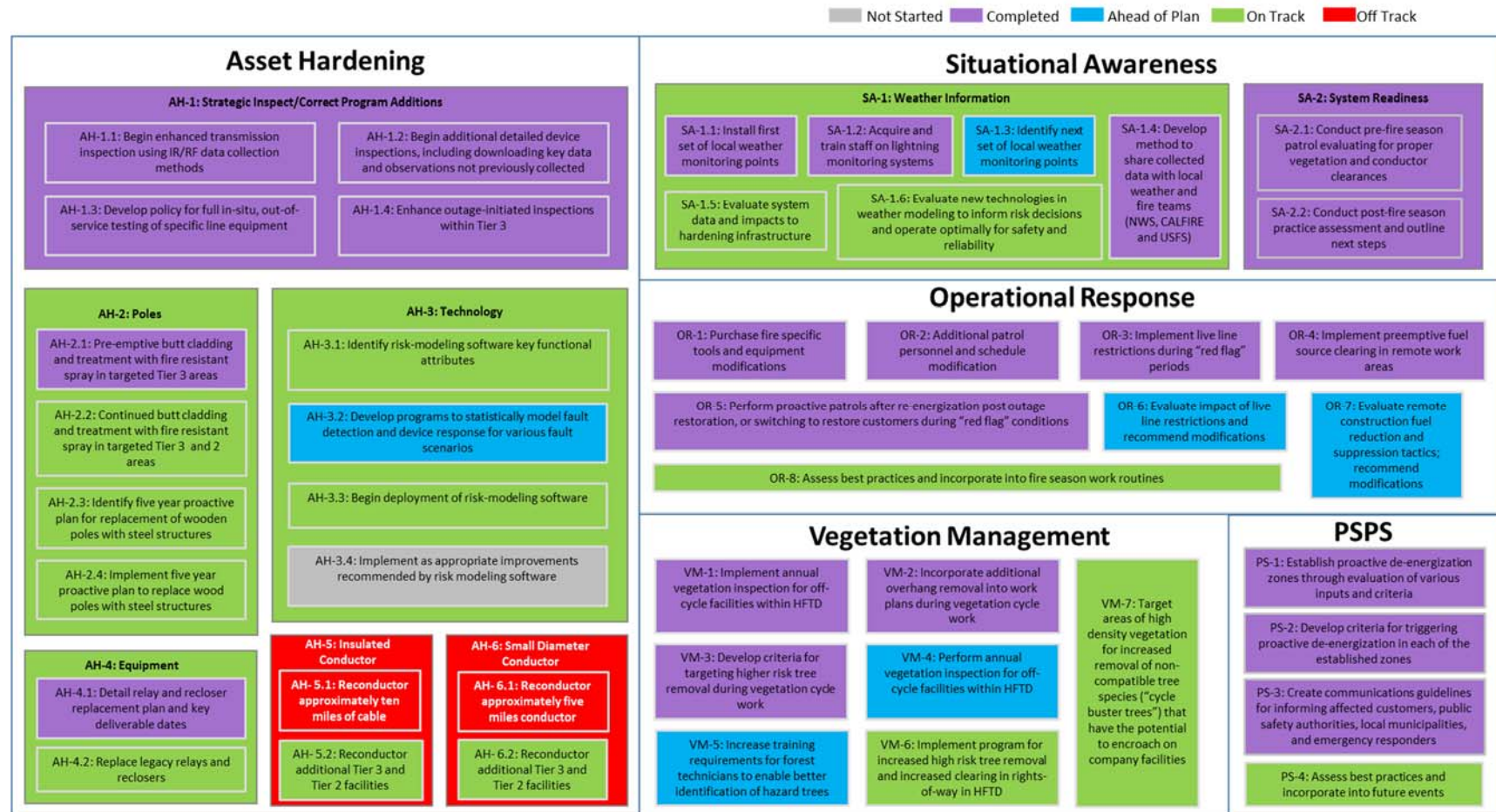


Figure 9: PacifiCorp's 2019 WMP Activities Summary Graphic

Additionally, the following table includes a brief summary of high level activities implemented in 2019, lessons learned, and minor changes or adjustments to existing programs incorporated into the 2020 WMP. As included in PacifiCorp's First Report Regarding Possible Off-Ramps²³, no significant changes were made nor were any new programs introduced or existing programs cancelled. This table is not meant to be an all-inclusive description of progress. Additional details regarding completed work and progress are included in Tables 21-30 in Section 5.3.

Wildfire Mitigation Category	Initiative/Program	Summary	Lessons Learned (where applicable)	Changing circumstances (where applicable)	Corresponding adjustments (where applicable)
Risk assessment and mapping	Climate-driven risk map modeling based on various relevant weather scenarios	PacifiCorp developed key variables against which it monitored forecast conditions to determine operational strategies to employ during the forecast risk periods	Additional threshold values will provide better guidance for operational and engineering staff, such that various combinations of permutations of these variables will identify risk levels (while not explicitly calculating an FPI)	Locations where weather patterns are determined to be substantially different warrant the development of customized threshold values	As more weather data is available (due to the placement of additional microstations) more granularity of historic data and identification of risk periods can occur
Situational awareness and forecasting	Advanced weather monitoring and weather station installation	PacifiCorp installed and commissioned 10 weather stations throughout the company's service territory in the state of California. The placement of additional stations in southern Oregon further complement regional situational awareness for both National Weather Service Personnel and other Public Safety Partners, as well as PacifiCorp's operations teams.	With multiple weather station installations, due to either positioning relative to needed measurements or ability to properly maintain established communication over inconsistent cellular networks, the weather stations needed to be moved multiple times and tested. PacifiCorp learned that this program has an iterative component that may continue over time in order to maintain data quality. Regular monitoring of the stations and verification of data streams is required.	Weather conditions and inconsistent cellular network communication capability	Inclusion of potential iteration and multiple attempts at positioning is now an understood and included element of weather station installation.
Grid design and system hardening	Distribution and transmission pole replacement and reinforcement, including with composite poles	An assessment of optimum material specification was performed prior to undertaking this full program, as noted in the company's	Steel was determined to be not preferable due to lightning environment, strength reduction when in high heat environment and	Cost and resource constraints	Change from use of steel to alternate materials such as fiberglass

²³ PacifiCorp's First Report Regarding Possible Off-Ramps was filed on November 27, 2019 in compliance with Decision 19-05-036.

Wildfire Mitigation Category	Initiative/Program	Summary	Lessons Learned (where applicable)	Changing circumstances (where applicable)	Corresponding adjustments (where applicable)
		2019 WMP filing. The overall system hardening program is effective, but is considering a minor modification to a specification and the use of polymer in place of steel.	costs; rather fiber reinforced polymer (FRP) poles.		
Asset management and inspections	HFTD Inspections & Corrections	Incorporated increase in inspection frequency and acceleration of correction timeframe per GO 95 and included in the 2019 WMP.	Additional granularity and functionality was required in both procedures, processes, data processing, and tools when identifying potential fire threat conditions and ensuring that these conditions were assigned an accelerated correction timeframe.	No additional specific changing circumstances identified for 2020-2022	Adjustments to internal policies, tracking mechanisms and frequency, and introduction of additional QA/QC reviews incorporated throughout 2019. No new adjustments.
	IR Inspections	PacifiCorp performed enhanced inspections on company owned overhead transmission lines in California via helicopter using IR/UV alternative technologies to identify hot spots, potential substandard connections or significant insulative degradation not typically detectable through visual inspection. Flights were performed at standard loading conditions as well as peak loading conditions.	Preliminary results indicate: <ul style="list-style-type: none"> • IR technology may be reliable method to potentially identify Conditions not normally found during a visual inspection; • Conditions can be detected at normal loading levels; • IR inspections may be more valuable at peak loading conditions; and • The combination of UV and IR inspections does not seem to be optimal 	No specific changing circumstances identified for 2020-2022 yet (still completing the pilot). During 2019 activity, PacifiCorp discovered that loading may have a strong impact on results and, therefore, needed to be evaluated.	Additional flights/inspections added throughout 2019 to accommodate performing inspections during peak loading
	LiDAR inspections	PacifiCorp performed LiDAR (Light Detection and Ranging) data collection, analysis, and system modeling on PacifiCorp's transmission and distribution network in four select areas of Northern California consisting of 924 line-miles and 12,803 structures in both rural and suburban environments.	Lessons learned remain unknown as the pilot project is yet to be completed. PacifiCorp anticipates understanding how this technology can be used to inform, identify, and quantify items such as current vegetation clearances, potential encroachments, asset status/condition, other hazards such as leaning poles or threat trees, dead/dying	No specific changing circumstances identified for 2020-2022 yet (still completing the pilot)	No specific corresponding adjustments identified for 2020-2022 yet (still completing the pilot)

Wildfire Mitigation Category	Initiative/Program	Summary	Lessons Learned (where applicable)	Changing circumstances (where applicable)	Corresponding adjustments (where applicable)
			trees, and density per circuit/line		
Vegetation management and inspections	Other discretionary inspection of vegetation around distribution electric lines and equipment, beyond inspections mandated by rules and regulations (radial pole clearing)	PacifiCorp radially cleared poles in 2019 using the specification and practices described in Section 5.3.5.9.	Throughout the implementation of PacifiCorp's radial pole clearing program in 2019, the activity and full scope of work proved to be more challenging, more complex, and less predictable than originally anticipated.	Varied terrain and significant range of scope and tools required	While no specific alterations were made to the program itself, PacifiCorp has set aside additional funding, resources, and time to more effectively plan and execute the company's 2020 work.
	Improvements of inspections - Electronic Tracking and Database	Execution of PacifiCorp's vegetation management wildfire mitigation program	Throughout PacifiCorp's planning and execution of the 2019 WMP, the company identified the need for an electronic database and GIS based planning tools to facilitate greater transparency, efficiency, and data analytics. Specifically, value was identified when populating PacifiCorp's 2020 WMP as many of the template elements proved challenging to populate in the manner requested.	This lesson learned reflects the growing wildfire risk and new reporting and measurement requirements per the CA 2020 WMP.	Implementation of new pilot project incorporating GIS based maps to determine scope and complete/record activity. See Section 5.3.5.6. Additional parallel activity to realize additional benefits through enhanced data analytics to inform vegetation density, vegetation diversity, and overall risk.
Grid operations and protocols	Automatic recloser operations	Implementation of the company's PCC 200, the company's policy designed to reduce the potential for ignition of a fire from sparks emitted when a line is re-energized despite a disturbance on the line through the augmentation of settings or features for reclosing devices.	Since PacifiCorp leverages a combination of devices and schemes throughout its service territory, application of a standard policy was more challenging than anticipated. PacifiCorp had to contemplate the application of this policy to various models of devices with a range of functionality and capability.	Implementation of the company's system automation grid hardening program.	No significant change other than awareness that the company's system automation grid hardening program will facilitate greater standardization but need to align with these strategies.
	PSPS events and protocols	In 2019, PacifiCorp implemented protocols governing execution of PSPS events including analysis of weather conditions,	While PacifiCorp did not implement a PSPS event in the state of California during the 2019 fire season, PacifiCorp did remain vigilant	Constantly changing weather patterns and overall risk levels.	A shifted focus from the capability and readiness to execute a PSPS event to a renewed focus on the evaluation of various

Wildfire Mitigation Category	Initiative/Program	Summary	Lessons Learned (where applicable)	Changing circumstances (where applicable)	Corresponding adjustments (where applicable)
		readiness of operations personnel, and emergency planning and restoration activities. While no actual PSPS events were executed, PacifiCorp learned a great deal through demonstration of the capability of executing a PSPS and general readiness.	and monitor elevated risk conditions throughout the year when required to be able to implement a PSPS event. During these time periods, PacifiCorp learned that the ability to efficiently and effectively implement a PSPS event within the company's service territory in a manner that keeps the impact to customers and communities as low as practical, is less about pre-installed devices and switching points and more about flexibility, system knowledge, and the ability to make informed decisions based on accurate information to task appropriate action in the moment. This includes leveraging local knowledge through collaboration with public safety partners.		<p>scenarios within the company's pre-defined PSPS zones to understand what projects may be able to promote needed flexibility and real-time accurate information gathering such as continued installation of weather stations.</p> <p>PacifiCorp also incorporated collaboration with local public safety partners when determining whether or not to implement a PSPS event.</p>
Data governance	Development of repositories to support wildfire analysis and risk mitigation for wildfire risks	In 2019 and 2020 WMPs PacifiCorp evaluated internal and external data sources to inform its assessment of wildfire risks. Certain of the datasets are internal (such as outage management) as well as external data sources (including weather, fire, habitat datasets)) which also are key to quantifying risks.	Data sources have varying degrees of accuracy and in general have been developed for their specific purposes (i.e. outage data to manage outages) rather than their application to quantifying wildfire risk.	As these datasets become repurposed reconciliation of anomalous results will be an important step in their continued value.	
Resource allocation methodology	All resource allocation methodology programs and risk spend efficiency calculations	In 2017, Per D. 19-04-020, PacifiCorp leveraged lessons learned from other utilities, previous risk and health assessment methodologies and basic principles of the International Standardization Organization's "Risk	While PacifiCorp remains fully committed to the continued development and improvement of the company's risk based decision making framework, many of the elements requested in this 2020 WMP	Further expansion and use of the company's risk based decision making framework to include wildfire risk and overall resource allocation.	Continued development and evolution of the company's risk based decision making framework and incorporate this methodology into PacifiCorp's CA WMP, specifically the methodology

Wildfire Mitigation Category	Initiative/Program	Summary	Lessons Learned (where applicable)	Changing circumstances (where applicable)	Corresponding adjustments (where applicable)
		Management – Principles and Guidelines” (ISO 31000) ²⁴ to develop the company’s first risk based decision making framework, which was subsequently included in the company’s 2018 GRC filing and supporting testimony. ²⁵	filing may not be applicable to PacifiCorp, specifically risk reduction, resource allocation methodology, and risk-spend efficiency calculations.		as it applies to resource allocation.
Emergency planning and preparedness	Completion and execution of PacifiCorp’s emergency response plan components specific to Fire Prevention, Preparedness and Response.	Initial development and filing of the company’s Fire Prevention and Fire Prevention, Preparedness, and Response Plan filed per GO 166 Attachment E ²⁶ as well as incorporation into PacifiCorp’s 2019 and 2020 WMP plans.	Since originally filed in 2018, PacifiCorp, at the guidance of Staff and stakeholders, identified the need for additional elements and details ²⁷ to be incorporated into the company’s Fire Prevention, Preparedness, and Response Plan.	Further development and on-going evaluation of PacifiCorp’s WMP, including the new elements contemplated in the company’s 2020 WMP provided additional context and requirements. PacifiCorp assumes this will continue to have an impact on the company’s Fire Prevention, Preparedness, and Response Plan.	<p>Critical elements, such as the incorporation of risk assessment, system resilience, and situational awareness aspects from the WMP were incorporated into the company’s Fire Prevention, Preparedness, and Response Plan in an attempt to make the Fire Prevention Plan more analogous to a playbook describing the operational readiness and response in the event of a wildfire.</p> <p>As with all of PacifiCorp’s emergency planning and preparedness programs, the company intends to continue implementation of these programs, incorporate new elements such as training, resources, tools, and processes where appropriate, and translate lessons learned or effectiveness into long term program modification and evolution.</p>

²⁴ ISO 31000 is an internationally recognized standard for risk management, and adopting the principles and guidelines of ISO 31000 positions an organization to be able to achieve objectives, improve the identification of risks, and more effectively allocate resources for risk reduction.

²⁵ 2018 PacifiCorp GRC, Exhibit PAC/1000, Direct testimony of Brett S. Allsup, Implementation of a Risk-Based Investment Decision Making Framework

²⁶ PacifiCorp’s General Order 166 Attachment E, Fire Prevention, Preparedness, and Response Plan, or FPP, initially filed on 10/31/2018.

²⁷ As indicated in CPUC Data Request 1.–is this the SDR? This was a data request regarding the 2019 WMP

Wildfire Mitigation Category	Initiative/Program	Summary	Lessons Learned (where applicable)	Changing circumstances (where applicable)	Corresponding adjustments (where applicable)
Stakeholder cooperation and community engagement	Community engagement	Implementation of the company's community engagement, specifically execution of town hall meetings and distribution of materials to facilitate emergency preparedness and awareness of PSPS events.	Communities have specific, localized concerns which need to be incorporated into communication and engagement.	Communities continue to want to be more engaged. Additionally, as PSPS protocols and programs change, communities may be affected differently.	PacifiCorp expanded the type and volume of communications and materials. Additionally, maps were provided to local officials and emergency responders regarding potential PSPS events.

C. List and describe all challenges associated with limited resources and how these challenges are expected to evolve over the next 3 years.

The following subsections include the strategy and programs of PacifiCorp's plan on various planning horizons ranging from months to years. All strategy and programs contemplated throughout PacifiCorp's 2020 WMP, including this section, reflect the company's reasonable best estimates for completion timeframe. However, as previously expressed at the September 2019 workshops, in the company's October 30, 2019 Phase II comments, and in PacifiCorp's First Report Regarding Possible Off-Ramps²⁸, one area of concern that continues to be a challenge, is the availability of qualified resources and materials. All of the investor-owned utilities in California are implementing mitigation programs of a similar nature on similar timelines. As a result, resources are spread very thin and the utilities are competing for resources. PacifiCorp anticipates that this will continue to be an area of concern throughout the implementation of its multi-year programs.

As these projects and programs are subject to continuous evaluation in an effort to drive continuous improvement, specifics may need to change and adapt to moving market conditions, resource constraints, and lessons learned. PacifiCorp intends to monitor potential changes, which the company will incorporate into future Off-Ramp filings.²⁹

D. Outline how the utility expects new technologies and innovations to impact the utility's strategy and implementation approach over the next 3 years, including the utility's program for integrating new technologies into the utility's grid.

As previously described in the company's 2019 California Fire Risk Mitigation Plan and appropriate subsections of Section 5.3 in the company's 2020 WMP, PacifiCorp recognizes that certain emerging technologies, while currently expensive relative to benefit, may provide significant benefit to wildfire risk mitigation. Therefore, PacifiCorp is continuously evaluating the use of new or alternate technologies to either improve efficiency

²⁸ PacifiCorp's First Report Regarding Possible Off-Ramps was filed on November 27, 2019 in compliance with Decision 19-05-036.

²⁹ As required in Decision 19-05-036.

or capability of existing programs or implement new programs all with a focus on wildfire mitigation and the core concepts described in Section 4.1.

However, PacifiCorp anticipates that new technologies and innovations will not significantly influence the overall strategy and core concepts. Instead, PacifiCorp anticipates that new technologies and innovations will most likely impact specific components, elements, or effectiveness of programs included in Section 5.3 and, therefore may change specific goals, targets, or prioritization of programs to reflect this impact.

PacifiCorp is already piloting new technology programs to evaluate the application and effectiveness regarding wildfire mitigation. Examples include but are not limited to the use of Infrared inspections, LiDAR data collection, active and remote weather monitoring, and advance detection and coordination schemes and equipment. PacifiCorp anticipates that over the next three years, the results of these pilot projects will significantly inform and mold future programs, and may either evolve into complete wide scale programs or be removed from consideration.

E. Utility's rationale and alternatives considered for wildfire mitigation programs included in the 2020 WMP

Generally, the list of potential programs included in the 2020 WMP Guidelines Attachment 1³⁰ and included in this Plan encompass all potential approaches that the utility may take to mitigate wildfire risk. Additionally, PacifiCorp thoughtfully and strategically developed the elements of the company's wildfire mitigation programs described in Section 5.0 in a manner to mitigate wildfire risk and address company specific ignition probability drivers described in Section 3.0. Therefore, limited alternatives were considered to this list of programs. Furthermore, alternatives were not considered for compliance based programs, as PacifiCorp is dedicated to maintaining compliance with California specific requirements.

However, PacifiCorp did consider alternatives regarding specific details, tools, frequency, or scope of specific programs. Examples of such include, but are not limited to, the use of IR or LiDAR technology during inspections, specific clearance and cycles selected for vegetation management programs, and the use of fiberglass versus steel for pole replacement programs. Where appropriate, these specifics are included in the subsections of Section 5. Where significant alternatives to specifics of PacifiCorp's wildfire mitigation programs warranted evaluation, PacifiCorp also developed pilot projects to properly understand the potential value and effectiveness of these options. The use of these pilot projects allow PacifiCorp to test alternatives or enhancements with a controlled and limited scope in a manner that still facilitates execution of existing programs, resulting in significant and necessary progress toward the mitigation of wildfire risk throughout its California service territory. These programs are described in detail along with established programs throughout Section 5.3.

³⁰ Attachment 1 (WMP Guidelines) included in the ALJ's ruling on Wildfire Mitigation Plan Templates and Related Material and allowing comment filed 12/16/19.

5.1 Wildfire Mitigation Strategy

The following subsections include PacifiCorp's organization-wide wildfire mitigation strategy and goals for each of the following time periods.

5.1.1 Before the upcoming wildfire season, as defined by the California Department of Forestry and Fire Protection (CALFIRE)

Situational Awareness and forecasting:

- Complete calibration and integration of existing 10 weather stations to ensure in working condition and able for use in PSPS evaluations during the 2020 fire season;
- Perform verification and validation of forecast vs actual fire weather data from 2019 to improve forwarding looking forecast;

Grid Design and system hardening:

- Augment existing program tracking methods to incorporate new requirements as indicated in the 2020 WMP and implement a new, robust program tracking system for system hardening projects;
- Prioritize programs needed before the next fire season and annual update and ensure inclusion in the CY2020 execution plan;
- Final installation and commissioning of 25 field reclosers located within the PSPS candidate zones as a part of the installation of system automation equipment program;
- Installation of an RF network to facilitate remote implementation of fire season settings on newly installed field reclosers;
- Final installation and commissioning of 12 transmission and distribution substation relays with advanced protection and control capabilities;

Asset management and inspections:

- Complete the CY2020 planned inspections within the HFTD;
- Complete remaining scope of IR inspections of transmission lines pilot project to include IR capture at winter peak loading;
- Analyze results from LiDAR inspection pilot to determine next steps and potential pilot project expansion;

Vegetation management and inspections:

- Complete incremental Tier III visual vegetation inspections within the HFTD;
- Evaluate LiDAR inspection pilot to determine next steps and potential pilot project expansion as it relates to vegetation management;

Grid operations and protocols:

- Review existing operating protocols and ensure preparedness for 2020 fire season;
- Develop a plan and schedule to leverage new high impedance fault detection capabilities and data analytics to inform operating procedures and protocols;

Stakeholder cooperation and community engagement

- Improve internal and external customer and community facing forecast of PSPS status (website);
- Continue partnering with public safety partners in communities throughout California regarding wildfire and PSPS preparedness;

5.1.2 *Before the next annual update*

PacifiCorp's wildfire mitigation strategy and goals to be accomplished before the next annual update include:

Situational awareness and monitoring:

- Complete installation of 10 additional weather stations and continue improvement of real time weather monitoring capability;
- Evaluate use and potential viability of RAWS-quality weather stations to augment the company's micro-station installations;
- Perform a probabilistic arc energy analysis on all circuits within the HFTD to improve circuit protection coordination;
- Perform a probabilistic arc energy analysis on all small diameter circuits outside of the HFTD to improve circuit protection coordination;
- Collaborate with Texas A&M and pilot distribution fault anticipation (DFA) technology at identified circuits to inform pre-fault inspection protocols;

Grid Design and system hardening:

- Complete full detailed scope for specific programs in years CY2021 and CY2022;
- Identify, scope, and begin all projects in some discipline related to the wildfire mitigation program through CY2023;
- Complete CY2020 scope of work pending resource constraints as identified in Section 5 above;
- Establish a system of audit with documentation through each phase of the project with checks and balances identified for quality assurance;

Asset management and inspections:

- Complete the CY2020 planned inspections within California;
- Collaborate with other industry utilities to further the evaluation of potential line equipment maintenance programs to augment existing compliance based programs;
- Establish long term strategy regarding the use of IR or LiDAR for equipment based inspections and maintenance;

Vegetation management and inspections:

- Evaluate and, if applicable, be prepared to implement a new tree density inventory system targeted initially within the HFTD to inform risk assessment and prioritization of efforts;
- Pilot new electronic planning, mapping, and record keeping system regarding vegetation management within the HFTD;
- Establish long term strategy regarding the use of LiDAR as it pertains to vegetation management and inspections;

Grid operations and protocols:

- Review existing operating protocols and ensure preparedness for 2021 fire season;
- Leverage RF network where available to facilitate remote implementation of fire season settings on newly installed field reclosers;
- Implement the plan to leverage new high impedance fault detection capabilities and data analytics to inform operating procedures and protocols;

Stakeholder cooperation and community engagement:

- Continue applicable improvements to internal and external customer and community facing forecast of PSPS status (website);
- Continue partnering with public safety partners in communities throughout California regarding wildfire and PSPS preparedness;

5.1.3 *Within the next 3 years*

PacifiCorp's wildfire mitigation strategy and goals to be accomplished within the next 3 years include:

Situational awareness and monitoring:

- Complete installation of all program weather stations and continue improvement of real time weather monitoring capability;
- Install any viable RAWS-quality weather stations to augment the company's micro-station installations;
- Complete recommendations per probabilistic arc energy analysis on all circuits within the HFTD to improve circuit protection coordination;
- Complete recommendations per probabilistic arc energy analysis on all small diameter circuits outside of the HFTD to improve circuit protection coordination;
- Evaluate benefits of distribution fault anticipation (DFA) technology in normal system operations;

Grid Design and system hardening:

- Complete CY2020 – CY2022 system hardening program scope per Tables 23 – 31.
- Evaluate the use of additional new technologies as it relates to grid design and system hardening programs;

Asset management and inspections:

- Complete annual scope of planned inspections in CY2020-CY2022 within California;
- Evaluate potential incorporation of risk assessment software solutions to inform asset management and inspections programs and augment existing risk based decision making framework;
- Memorialize findings regarding evaluation of potential line equipment maintenance programs and incorporate, where appropriate, new programs into the long term asset management strategy;

Vegetation management and inspections:

- Evaluate overall workforce management strategies and structures to augment existing programs;
- Incorporate lessons learned through tree inventory system analytics to inform risk assessment and prioritization of efforts;
- Implement new electronic planning, mapping, and record keeping system regarding vegetation management within the HFTD;

Grid operations and protocols:

- Review existing operating protocols and ensure preparedness for 2024 fire season;
- Expand capability of RF network to facilitate remote implementation of fire season settings on newly installed field reclosers;
- Validate efficacy of high impedance fault detection in both day to day and extreme weather condition operations;

Stakeholder cooperation and community engagement:

- Continue applicable improvements to internal and external customer and community facing forecast of PSPS status (website);
- Incorporate three year history, enhanced real time weather monitoring capability, and system hardening progress to, where appropriate, evaluate PSPS methodology and protocols and potential reduce the potential scope or impact of PSPS events;
- Continue partnering with public safety partners in communities throughout California regarding wildfire and PSPS preparedness;

5.1.4 Within the next 10 years

PacifiCorp's general goal within the next ten years is to complete the work included in this plan to mitigate wildfire risk and continue the vigilance of discovery, technology, shared information and program improvements and further grow the programs in areas identified from data collection and analysis. As PacifiCorp is early in the implementation of its multi-year WMP, it is challenging to set additional specific goals on a ten year planning horizon, except to the extent that certain programs can be delivered within the three year period. However, as PacifiCorp progresses with program implementation and lessons learned are incorporated, the company anticipates firming up these longer term goals in future updates to the plan.

5.2 Wildfire Mitigation Plan Implementation

The following describes the processes and procedures PacifiCorp is using or intends to use to facilitate implementation of the company's WMP.

- A. Monitor and audit the implementation of the plan. Include what is being audited, who conducts the audits, what type of data is being collected, and how the data undergoes quality assurance and quality control.*

To facilitate the implementation of PacifiCorp's 2020 WMP construction projects (system hardening, relays, reclosers, communication, etc.) a focused wildfire mitigation project management office has been established as described in Section 5.3.3. It is the responsibility of this department to monitor all aspects of construction (permitting, standards, estimating, construction, and post audit quality assurance) to ensure the plan deliverables are achieved. The non-construction aspects of the 2020 WMP are overseen by existing program offices such as Vegetation Management, Asset Management, Emergency Management etc. that will have the responsibility of collecting all pertinent information (inspection records, etc.) to ensure compliance. All collected data will be maintained in the company's corporate enterprise systems. Additional details regarding QA/QC or audit specifics for each program are further described in each program's respective subsection in Section 5.3.

- B. Identify any deficiencies in the plan or the plan's implementation and correct those deficiencies.*

The Emergency Management department will be responsible for ensuring annual review of preparedness of on-going tasks and processes such as; Wildfire Prevention Practices for operational employees and PSPS processes. Part of this review includes the use of desktop exercises and after event reports for lessons learned that can inform and improve future plans as included and further described in Section 5.3.9.

Additionally, imbedded within the program specific QA/QC and auditing plans is the incorporation of corrective action. Specific to the company's grid design and system hardening programs, PacifiCorp recently formed a Wildfire Mitigation Delivery Project Management Office within the Transmission and Distribution Operations department and assigned a Wildfire Mitigation Delivery Director to lead this effort. While this department remains in its early stages and is not yet fully formed, the office intends to explore and develop a quality assurance process throughout the life cycle of the programs, specifically focused on the construction phase of these programs, which will include a process to correct deficiencies discovered. Potential solutions currently under consideration might include the use of qualified inspectors, standardized forms and evaluations, or random sampling and inspection by the Wildfire Mitigation Delivery Director. PacifiCorp anticipates that this aspect of the program will evolve quickly and intends to provide additional updates and detail in the company's first annual update in 2021.

- C. Monitor and audit the effectiveness of inspections, including inspections performed by contractors, carried out under the plan and other applicable statutes and commission rules.*

PacifiCorp has an existing inspection program that includes post-inspection auditing program of inspections performed by contractors. All additional inspections laid out in the 2020 WMP are included in the on-going inspection program and will be held to the same standard to ensure compliance with applicable statutes and commission rules. Additional program specific information has been included in applicable subsections of Section 5.3.4.

D. For all data that is used to drive wildfire-related decisions, including grid operations, capital allocation, community engagement, and other areas, provide a thorough description of the utility's data architecture and flows. List and describe 1) all dashboards and reports directly or indirectly related to ignition probability and estimated wildfire consequences and reduction, and 2) all available GIS data and products. For each, include metadata and a data dictionary that defines all information about the data. For each, also describe how the utility collects data, including a list of all wildfire-related data elements, where it is stored, how it is accessed and by whom. Explain processes for QA/QC, cleaning and analyzing, normalizing, and utilizing data to drive internal decisions. Include list of internal data standards and cross reference for the data sets or map products to which standards apply.

PacifiCorp leverages a range of data set, sources, processes, and tools to drive wildfire-related decisions, including grid operations, capital allocation, community engagement, and other areas such as PSPS evaluation or system hardening and pilot projects. Where pertinent to a specific component or program of the 2020 WMP and available in a way requested, PacifiCorp has included a description of relevant data set in applicable subsections throughout the Plan, such as PSPS activation measurements, data sets, and criteria described in Section 4.4.3 or internal and external data sets used to develop the company's ignition probability drivers included in Section 3.0.

It is challenging to provide a full list and description in the way requested of all data, meta-data, dashboards, reports, GIS data, products, QA/QC cleaning and analyzing, normalizing, and utilizing processes, as well as applicable cross references or dictionary definitions, as this work product is not part of a data set required to operate the system and, therefore, is not readily available. Furthermore, as PacifiCorp uses a vast range of data, meta-data, processes, tools, and products to drive wildfire-related decisions and the creation of this work product would be overly burdensome. Moving forward, PacifiCorp will look to provide additional details regarding the company's data leveraged to drive wildfire-related decision, but cannot, at this time, provide the information and specific work product in the manner requested. PacifiCorp also suggests additional discussions with the WSD to determine whether additional information would be helpful and to determine the most efficient and effective manner to provide this data.

5.3 Detailed wildfire mitigation programs

PacifiCorp leveraged the methodology and framework included in the company's 2018 GRC filing as well as PacifiCorp's 2019 WMP and subsequent collaborative efforts to inform the company's 2020 WMP and included programs.

The following subsections include PacifiCorp's detailed wildfire mitigation programs and initiatives organized into the following top categories:

1. Risk assessment and mapping
2. Situational awareness and forecasting
3. Grid design and system hardening
4. Asset management and inspections
5. Vegetation management and inspections
6. Grid operations and protocols
7. Data governance
8. Resource allocation methodology
9. Emergency planning and preparedness
10. Stakeholder cooperation and community engagement

Each of these categories is addressed in the following subsections. Each section includes a detailed description for the utility's programs, approximate timeline of each program, the utility's rationale behind each of the elements of this program, the utility's prioritization approach/methodology to determine spending and deployment of human and other resources, how the utility will conduct audits or other quality checks on each program, how the utility plans to demonstrate over time whether each component is effective, and expectations for general evolution (1) before the upcoming wildfire season, (2) before the next annual update, (3) within the next 3 years, and (4) within the next 10 years.

For each program, where requested, 2019 plan values were included as N/A. The 2019 WMP did not include specific annual requirements and, therefore, PacifiCorp only provided the total proposed program units and costs. Including any 2019 plan values for WMP programs contemplated in the company's 2019 WMP would be confusing and not helpful in understanding progress or the company's overall programs as these values reflect the total multi-year program proposals.

With each program, as new analysis, technologies, practices, network changes, environmental influences, or risks are identified, changes to address them may be incorporated into future iterations of the Plan which is, in effect, a living document. This may include changes to the specific programs

and initiatives included in Section 5.3 of this document. Where appropriate, PacifiCorp will memorialize such changes in either subsequent filings or future Off-Ramp filings.³¹

S-MAP and RAMP process for small and multijurisdictional utilities

As a small and multijurisdictional utility, PacifiCorp complies with the adopted methodology per D.19-04-020 regarding the company's S-MAP and RAMP process. Historically, PacifiCorp has performed annual risk assessment of its key transmission and distribution asset base to identify potential issues, develop investment drivers, target short and long term programs, and inform the company's capital, maintenance, and operational spending decision. In 2014, PacifiCorp began using an Asset Health Index (AHI) methodology combined with historic assessment elements such as asset utilization, system reliability, and asset condition inspections to develop comparative health of assets baseline and determine relative changes.

In 2017, Per D. 12-12-025,³² PacifiCorp leveraged lessons learned from other utilities, previous risk and health assessment methodologies and basic principles of the International Standardization Organization's "Risk Management – Principles and Guidelines" (ISO 31000)³³ to develop the company's first risk based decision making framework, which was subsequently included in the company's 2018 GRC filing and supporting testimony.³⁴ This methodology included assessment of the company's top categorical risks including but not limited to substation transformer failure, substation circuit breaker failure, overhead distribution conductor failure, and relay mis-operation.

As is expected with small and multijurisdictional utilities per D.19-04-020, PacifiCorp has adhered to the 10 RAMP Elements in the company's risk based decision making framework but still remains in the early stages of the S-MAP and RAMP process.

Many of the elements requested in this 2020 WMP filing may not be applicable to PacifiCorp, specifically risk reduction, resource allocation methodology, and risk-spend efficiency calculations. To the extent that a program addresses a top categorical risk included in the company's GRC filing, PacifiCorp can qualify relative risk ranking. However, PacifiCorp, at this time, cannot provide the discreet calculations as requested. At the guidance of the Wildfire Safety Division of the California Public Utilities Commission,³⁵ these elements are marked "does not apply", "not applicable", or "N/A" throughout the company's filing.

³¹ As required in Decision 19-05-036.

³² CA Decision No. ("D") 14-12-025 issued on December 4, 2014.

³³ ISO 31000 is an internationally recognized standard for risk management, and adopting the principles and guidelines of ISO 31000 positions an organization to be able to achieve objectives, improve the identification of risks, and more effectively allocate resources for risk reduction.

³⁴ 2018 PacifiCorp GRC, Exhibit PAC/1000, Direct testimony of Brett S. Allsup, Implementation of a Risk-Based Investment Decision Making Framework

³⁵ Clarified in an email from Melissa K. Semcer, Program Manager Wildfire Safety Division at the California Public Utilities Commission on January 6, 2019.

5.3.1 Risk assessment and mapping

PacifiCorp actively participated in the development of the California Fire Threat map and leveraged that process and work product to determine its prioritization for public safety power shutoff and system hardening. Foundational to that work, as discussed previously, were local operating experiences and history such that local issues, such as ingress/egress were considered in promoting specific areas to elevated fire risk. Since that time PacifiCorp hasn't undertaken more specific risk assessment, however it has laid the groundwork for more locational-precise data through the placement of micro-weather stations. These stations produce information which can be consumed by the company in its real-time and after the fact analysis, as well as external stakeholders, including academia and other researchers, since the data is transmitted to MesoWest, a weather data resource housed by the University of Utah's Atmospheric Science Department, which can be viewed at mesowest.utah.edu.

5.3.1.1 A summarized risk map showing the overall ignition probability and estimated wildfire consequence along electric lines and equipment

Program Name	Risk Assessment and Mapping
Initiative Name	A summarized risk map showing the overall ignition probability and estimated wildfire consequence along electric lines and equipment
Description	PacifiCorp implemented fully throughout its systems the California High Fire Threat Map, which quantifies specific geography that under historically-viable fire weather conditions, could be subject to elevated fire risk. It created associations between the tier designation to inform inspection, vegetation management, correction timeframes, and prioritized hardening efforts.
Timeline to Minimize Risk [Planned/ Implemented]	Implemented
Rationale for Program	Wildfire risk mapping is foundational to prioritizing efforts for a variety of activities undertaken throughout the business. With this information certain program locations can be advanced more rapidly, while other locations can be addressed later.
Prioritization Approach	Tier 3 areas, and those facilities electrically-connected to Tier 3 are highest priority while Tier 2 and Zone 1 areas are next highest priority. Non-tier areas are considered lowest fire mitigation risk priority.

Plan for audits/quality checks		N/A
Planned demonstration of effectiveness over time		Effectiveness over time will be discernable through time via metrics such as those outlined in Table 1.
Planned Evolution	General	It is expected that varying surface (fuel) conditions and other temporal changes will need to be incorporated into the stable long term identification of higher fire risk areas.
	Before the upcoming wildfire season	N/A
	Before the next annual update	N/A
	Within the next 3 years	Develop method to incorporate temporal elements into stable fire threat map.
	Within the next 10 years	Incorporate method for temporal element inclusion to update basic stable fire threat map.

5.3.1.2 Climate-driven risk map modeling based on various

Program Name	Risk Assessment and Mapping
Initiative Name	Climate-driven risk map modeling based on various
Description	Develop methods for incorporating climate impacts into wildfire risks into system hardening (long term prioritization) as well as situational awareness (short term response) actions. Specific climate conditions may result in elevated wildfire risk, as is experienced in southern California during Santa Ana wind conditions. To the extent that such a phenomenon exists in PacifiCorp's service territory, outlining the leading indicators of the condition, the probable effects and the appropriate mitigation measures is an important augmentation of the company's WMP.
Timeline to Minimize Risk [Planned/ Implemented]	Planned
Rationale for Program	More specific identification of weather phenomenon that leads to heightened risk will allow the company to align hardening and operational tactics appropriately including optimal use of public safety power shutoff actions.
Prioritization Approach	Tier 3 areas, and those facilities electrically-connected to Tier 3 are highest priority while Tier 2 and Zone 1 areas are next highest priority. Non-tier areas are considered lowest fire mitigation risk priority.
Plan for audits/quality checks	PacifiCorp develops such theories engaging peer review to ensure well-vetted rationale and reasonable outcomes. To the extent that a climatological phenomenon is identified it would anticipate reviewing such products with audiences in venues such as the California Utility Forecasters Meeting ³⁶
Planned demonstration of effectiveness over time	Any advancements in this area should be discernable through the metrics supplied in Tables 1, 2, 10 and 12.

³⁶ This is an annually held conference by parties to advance the understanding of weather and its impacts to utilities and allows for academia, utilities and other interested parties to explore emerging information.

Planned Evolution	General	While PacifiCorp has not historically evaluated climate beyond its impact to fundamental needs to deliver power reliably, as it embarks on this aspect of risk mitigation it will be touching upon new areas of study to support developing such products. It will engage as appropriate with specialists, but align these endeavors toward their application to the utility environment and not necessarily fully develop in a manner not intended for other applications.
	Before the upcoming wildfire season	No specific advancement prior to the upcoming wildfire season is anticipated.
	Before the next annual update	PacifiCorp will begin exploring climate phenomenon with local weather professionals to identify any areas for investigation.
	Within the next 3 years	PacifiCorp will advance relevant climate phenomenon and share progress with local weather professionals through venues such as the California Utility Forecasters Meeting.
	Within the next 10 years	PacifiCorp will develop any utility relevant climate phenomenon and share application with local weather professionals through venues such as the California Utility Forecasters Meeting.

5.3.1.3 Ignition probability mapping showing the probability of ignition along the electric lines and equipment

Program Name	Risk Assessment and Mapping
Initiative Name	Ignition probability mapping showing the probability of ignition along the electric lines and equipment
Description	In the approval of PacifiCorp's WMP, the company was ordered to produce annually a Utility Fire Incident Report similar to that required of the three largest Investor Owned Utilities in D.14-02-015. As a result of the data collected, in addition to the analysis done by PacifiCorp supporting its Metric #4: Events recorded with fire reference: damage fire, equipment fire, pole fire, PacifiCorp can more precisely begin to establish history for ignitions and fires related to specific component types. As it becomes clear that certain components, particularly in wildfire risk time periods are more prone to ignition, risk models can begin to incorporate equipment specifics. This data will support improved alignment of programs including hardening, vegetation management and inspection to mitigate these events.
Timeline to Minimize Risk [Planned/ Implemented]	Planned
Rationale for Program	Better granularity about specific components within certain higher risk environments will support improved performance at lower costs.
Prioritization Approach	Tier 3 areas, and those facilities electrically-connected to Tier 3 are highest priority while Tier 2 and Zone 1 areas are next highest priority. Non-tier areas are considered lowest fire mitigation risk priority.
Plan for audits/quality checks	PacifiCorp will make underlying data available through the delivery of its Fire Incident Data Report as well as its proposed Metric #4.
Planned demonstration of effectiveness over time	It is expected that delivery of this activity will be visible in performance as outlined in Tables 2 and 3.

Planned Evolution	General	Historically data was not captured as is now planned, thus comparing history to current and future performance may result in conclusions being drawn that are not correct, due to variations in reporting practices over time. As such, any significance regarding trends must be cautiously undertaken, when comparing across those periods.
	Before the upcoming wildfire season	Submit Fire Incident Data Report, consistent with Order approving the company's WMP.
	Before the next annual update	Augment data; evaluate any recent observations to support understanding of equipment performance.
	Within the next 3 years	Augment data; incorporate risk findings into relevant risk methodology framework.
	Within the next 10 years	Augment data; incorporate risk findings into relevant risk methodology framework.

5.3.1.4 Initiative mapping and estimation of wildfire and PSPS risk-reduction impact

Program Name	Risk Assessment and Mapping
Initiative Name	Initiative mapping and estimation of wildfire and PSPS risk-reduction impact
Description	To develop PSPS boundaries the company evaluated fire weather wind patterns and magnitude coincident to tier designations within the California Fire Threat Map. It then considered electrical equipment and customers impacted within the specific geography. As a result proactive de-energization zones (PDZs) were outlined and sectioned to limit the number of customers likely to be affected by any PSPS implemented. Customers, including both critical (categorized consistent with the CPUC's directive of critical based upon Standard Industrial Classification Codes-SICC) and "medical baseline" customers were identified and attempts to limit the total customers and these critical customers resulted in sectioning up larger PDZs into five specific areas.
Timeline to Minimize Risk [Planned/ Implemented]	Implemented
Rationale for Program	In order to mitigate fire risk from utility equipment under the most extreme conditions, PSPS was developed as a method, with specific guidance in ESRB-8 to ensure proper notification protocols are undertaken to mitigate the consequences to customers and the public.
Prioritization Approach	Tier 3 areas, and those facilities electrically-connected to Tier 3 are highest priority while Tier 2 and Zone 1 areas are next highest priority. Non-tier areas are considered lowest fire mitigation risk priority.
Plan for audits/quality checks	No specific plans for audits or quality checks were developed for these plans with parties outside of the impacted communities. The company met with these stakeholders in city/county coordination meetings for Public Safety Partners and open houses for customers. The material is broadly shared in map form at the company's website https://www.pacificpower.net/content/dam/pcorp/documents/en/pacificpower/outages-safety/wildfire-safety/CA_PDZ_Maps_All.pdf

Planned demonstration of effectiveness over time		It is anticipated that after action reports required by ESRB-8 will demonstrate the effectiveness of these plans. Additionally rulemaking activities regarding PSPS are further opportunities to determine that the plans properly balance risk of utility-caused ignition versus customer and community impacts.
Planned Evolution	General	PacifiCorp developed its PSPS plans in late 2018 and during 2019 had no occasion to activate them fully, however internal watch periods occurred twice, thus its experience with managing these risks is largely informed by observations of its utility peers, and it does regularly assess the reports that have been filed by utilities as well as the comments filed by parties. It has found this information helpful. In addition, as the company “hardens” its infrastructure, the probability of reaching thresholds that would result in a PSPS become lower, so incorporating the changing utility equipment will be an important aspect of refreshing these plans. Further, as equipment-specific risks become better known, dialing into those risks will additionally provide insight into specific risks to the system that could result in ignition.
	Before the upcoming wildfire season	Re-evaluate current PDZs in light of recent performance data developed in support of 2020 WMP.
	Before the next annual update	Modify PSPS plan in light of delivered system hardening projects. Communicate modifications to plan to communities.
	Within the next 3 years	Modify PSPS plan in light of delivered system hardening projects. Communicate modifications to plan to communities.
	Within the next 10 years	Modify PSPS plan in light of delivered system hardening projects. Communicate modifications to plan to communities.

5.3.1.5 Match drop simulations showing the potential wildfire consequence of ignitions that occur along the electric lines and equipment

Program Name	Risk Assessment and Mapping
Initiative Name	Match drop simulations showing the potential wildfire consequence of ignitions that occur along the electric lines and equipment
Description	<p>N/A</p> <p>PacifiCorp does not, at this time, have a risk assessment and mapping wildfire mitigation program focused on match drop simulations showing the potential wildfire consequence of ignitions that occur along the electric lines and equipment.</p>

5.3.1.6 Weather-driven risk map an modeling based on various relevant weather scenarios

Program Name	Risk Assessment and Mapping
Initiative Name	Weather-driven risk map an modeling based on various relevant weather scenarios
Description	PacifiCorp developed specific weather criteria based on its analysis of historic fires and their spread that were located in northern California (for latitudes north of the 40 th parallel) as part of its 2019 WMP and in support of its PSPS plans. Associating independent variables, then developing methods for measuring (through the placement of weather stations in the areas of fire risk) and monitoring through the relevant risk period, weather-driven risk was incorporated into actions plans.
Timeline to Minimize Risk [Planned/ Implemented]	Implemented
Rationale for Program	Using independent variables it was able to correlate extremely large fires to specific drought, fire weather and wind gusts, and using this data establish triggers, rather than specific maps, that could be expected
Prioritization Approach	Tier 3 areas, and those facilities electrically-connected to Tier 3 are highest priority while Tier 2 and Zone 1 areas are next highest priority. Non-tier areas are considered lowest fire mitigation risk priority.
Plan for audits/quality checks	Data was evaluated by fire science and weather professionals, and subsequently operationalized by weather professionals. No additional plan for audits of the data have been prepared, however the company is prepared to share its findings and experiences with any interested parties.
Planned demonstration of effectiveness over time	The effectiveness of this approach is demonstrated through its performance during fire season 2019, but anticipates that the metrics it proposed in its data collection plan, in addition performance shown in Table 2 indicates the effectiveness of the approach.

Planned Evolution	General	Many of the metrics being provided through the 2020 WMP are nascent and likely to be not properly comparable on a going-backward basis.
	Before the upcoming wildfire season	Re-evaluate weather independent variables for recent fire history environmental conditions.
	Before the next annual update	Assess approach and determine continued viability of method.
	Within the next 3 years	Assess approach and determine continued viability of method.
	Within the next 10 years	Assess approach and determine continued viability of method.

5.3.1.7 Other/not listen [only is an initiative cannot feasibly be classified within those listen above]

Program Name	Risk Assessment and Mapping
Initiative Name	Other/not listen [only is an initiative cannot feasibly be classified within those listen above]
Description	PacifiCorp, at this time, does not have any additional risk assessment and mapping wildfire mitigation programs.

Table 21 below summarizes all elements of PacifiCorp's risk assessment and mapping wildfire mitigation program. For each program, where requested, 2019 plan values were included as N/A. The 2019 WMP did not include specific annual requirements and, therefore, PacifiCorp only provided the total proposed program units and costs. Including any 2019 plan values for WMP programs contemplated in the company's 2019 WMP would be confusing and not helpful in understanding progress or the company's overall programs as these values reflect the total multi-year program proposals.

Table 21: Risk assessment and mapping

Initiative activity	Year	Line miles to be treated	Spend/treated line mile	Ignition probability drivers targeted	Risk reduction	risk-spend efficiency	Other risk drivers addressed	Existing/new	Existing: What proceeding has reviewed program	If new: Memorandum account	In/exceeding compliance with regulations	Cite associated rule	Comments
1. A summarized risk map showing the overall ignition probability and estimated wildfire consequence along electric lines and equipment	2019 plan	PacifiCorp implemented fully throughout its systems the California High Fire Threat Map, which quantifies specific geography that under historically-viable fire weather conditions, could be subject to elevated fire risk. It created associations between the tier designation to inform inspection, vegetation management, correction timeframes, and prioritized hardening efforts. Wildfire risk mapping is foundational to prioritizing efforts for a variety of activities undertaken throughout the business. With this information certain program locations can be advanced more rapidly, while other locations can be addressed later.											
	2019 actual												
	2020												
	2021												
	2022												
	2020-2022 plan total												
2. Climate-driven risk map modeling based on various	2019 plan	Develop methods for incorporating climate impacts into wildfire risks into system hardening (long term prioritization) as well as situational awareness (short term response) actions. Specific climate conditions may result in elevated wildfire risk, as is experienced in southern California during Santa Ana wind conditions. To the extent that such a phenomenon exists in PacifiCorp's service territory, outlining the leading indicators of the condition, the probable effects and the appropriate mitigation measures is an important augmentation of the company's WMP. PacifiCorp develops such theories engaging peer review to ensure well-vetted rationale and reasonable outcomes. To the extent that a climatological phenomenon is identified it would anticipate reviewing such products with audiences in venues such as the California Utility Forecasters Meeting											
	2019 actual												
	2020												
	2021												
	2022												
	2020-2022 plan total												
3. Ignition probability mapping showing the probability of ignition along the electric lines and equipment	2019 plan	N/A	N/A	Contact from object; All types of equipment/facility failure; Wire-to-wire contact/contact amination; Other	N/A	N/A	Better use of PSPS in light of equipment and weather coincidence	New	N/A	2019 WMP Memorandum Account	Exceeds current requirements	GO95 Generally	Anticipate one study outcome per year, which is generally cumulative
	2019 actual	N/A	N/A										
	2020	1	\$25,000										
	2021	1	\$25,000										
	2022	1	\$25,000										
	2020-2022 plan total	3	\$25,000										

Initiative activity	year	Line miles to be treated	Spend/treated line mile	Ignition probability drivers targeted	Risk reduction	risk-spend efficiency	Other risk drivers addressed	Existing/new	Existing: What proceeding has reviewed program	If new: Memorandum account	In/exceeding compliance with regulations	Cite associated rule	Comments
4. Initiative mapping and estimation of wildfire and PSPS risk-reduction impact	2019 plan	N/A	N/A	Improper Application of PSPS Actions	N/A	N/A	Better informed stakeholder understanding of PSPS	Existing	N/A	2019 WMP Memorandum Account	Exceeds current requirements	GO95 Generally	Advanced ESRB-8 and HFTD maps to quantify impacted areas; communicated with communities
	2019 actual												
	2020												
	2021												
	2022												
	2020-2022 plan total												
5. Match drop simulations showing the potential wildfire consequence of ignitions that occur along the electric lines and equipment	2019 plan	PacifiCorp does not, at this time, have a risk assessment and mapping wildfire mitigation program focused on match drop simulations showing the potential wildfire consequence of ignitions that occur along the electric lines and equipment.											
	2019 actual												
	2020												
	2021												
	2022												
	2020-2022 plan total												
6. Weather-driven risk map an modeling based on various relevant weather scenarios	2019 plan	N/A	N/A	Contact from object; All types of equipment/facility failure; Wire-to-wire contact/contactation; Other	N/A	N/A	Better use of PSPS in light of equipment and weather coincidence	Existing	N/A	2019 WMP Memorandum Account	Exceeds current requirements	GO95 Generally	No specific charges developed for this plan; Assumes annual refresh to support operational and PSPS thresholds
	2019 actual												
	2020												
	2021												
	2022												
	2020-2022 plan total												
7.Other/not listen [only is an initiative cannot feasibly be classified within those listen above]	2019 plan	PacifiCorp, at this time, does not have any additional risk assessment and mapping wildfire mitigation programs.											
	2019 actual												
	2020												
	2021												
	2022												
	2020-2022 plan total												

5.3.2 *Situational awareness and forecasting*

A critical element to PacifiCorp's WMP revolves around situational awareness, and as it has analyzed history, developing methods for incorporating found conditions to establish when similar conditions could be expected in the future and forecast when they may be expected. Thus it has enhanced substantially its situational awareness as part of its day to day and elevated fire risk periods. This has substantially enhanced the methods used by the company to limit risks of utility-caused ignitions while simultaneously limiting impacts to customers and communities the company serves.

The following subsections describe all required elements of PacifiCorp's situational awareness and forecasting wildfire mitigation initiatives.

5.3.2.1 Advanced weather monitoring and weather stations

Program Name	Situational Awareness
Initiative Name	Advanced weather monitoring and weather stations
Description	Implement weather monitoring functions, including placing needed stations to support needed level of granularity for real time and retrospective analysis of environmental conditions that could pose risk to utility or could result in utility operations that could create wildfire risk. Monitor real-time system, including establishing appropriate triggers to initiate specific responses throughout organization, which could include modifying reclosing or other device "fire settings", activating monitoring teams or initiating PSPS operations.
Timeline to Minimize Risk [Planned/ Implemented]	Partially Implemented
Rationale for Program	In order to ensure that locally appropriate utility operations take place sufficient weather monitoring data points need to exist to inform those operations. Thus placement of stations that support better understanding of local climatology that could result in elevated fire risk, as well as analysis of fire weather history are foundational steps. With this information the utility is better able to take actions when needed and not expend resources when there is no significant wildfire risk.
Prioritization Approach	Tier 3 areas, and those facilities electrically-connected to Tier 3 are highest priority while Tier 2 and Zone 1 areas are next highest priority. Non-tier areas are considered lowest fire mitigation risk priority.

Plan for audits/quality checks		As weather stations are placed they are quality tested (calibrated) and verified that they are transmitting data. As data is analyzed and used to establish operational triggers this information is shared with Public Safety Partners and is available for review by these and other stakeholders. Annually the weather stations are calibrated to ensure all hardware is measuring properly and communicating properly with data aggregating resources.
Planned demonstration of effectiveness over time		Assessment of performance as outlined
Planned Evolution	General	During 2019 PacifiCorp installed 10 weather stations and with this data and established weather monitoring protocol enacted its operational plans throughout the 2019 fire season. The company is evaluating the viability of installing RAWS (Remote Automatic Weather Station)-quality stations to augment its micro-station installations.
	Before the upcoming wildfire season	Calibrate 10 weather stations placed during 2019.
	Before the next annual update	Install additional 2020 WMP stations.
	Within the next 3 years	Complete build out of PacifiCorp's California weather network.
	Within the next 10 years	Maintain and evaluate completeness of PacifiCorp's California weather network.

5.3.2.2 Continuous monitoring sensors

Program Name	Situational Awareness
Initiative Name	Continuous monitoring sensors
Description	At this time PacifiCorp does not have a specific initiative for continuous monitoring sensors. However, PacifiCorp is contemplating the use of distribution fault anticipation (DFA) technology through piloting with Texas A&M.

5.3.2.3 Fault indicators for detecting faults on electric lines and equipment

Program Name	Situational Awareness
Initiative Name	Fault indicators for detecting faults on electric lines and equipment
Description	<p>Information being captured and communicated rapidly in a manner to enable operational staff to make rapid, accurate decisions is critical to safe and reliable service. In addition, devices that are able to detect fault events, operate rapidly when conditions have been reached and accurately perform the designed-for function are key components for the in situ environment.</p> <p>Fault indicators are devices capable of detecting and reacting to line fault events, in a manner that when such operations occur, the fault condition is confined to as small a section as possible, for as short of a time as possible. Awareness of these conditions allows for quick reaction to restore the system to the pre-fault condition state and ensure safety and customer reliability. To the extent fault events are able to rapidly be communicated to grid operations and local response personnel, they are better informed about the current state of the system, they become more situationally aware, and can better coordinate with other Public Safety Partners, while improving outcomes for the communities in which the event occurred.</p> <p>PacifiCorp efforts and strategy regarding deployment and use of fault indicators are prioritized based on geographic wildfire risk area such that the highest priority is given to Tier 3 areas and those facilities electrically-connected to Tier 3 and Tier 2 and Zone 1 areas are next highest priority. Non-tier areas are considered lowest fire mitigation risk priority.</p> <p>While this program is critical to facilitate situational awareness, the overall management of this program is better suited with PacifiCorp's grid design and system hardening program focused on system automation, additional details have been included in Section 5.3.3.9. Costs and timelines for this program were outlined in Table 23, Initiative Activities 2.</p>

5.3.2.4 Forecast of a fire risk index, fire potential index, or similar

Program Name	Situational Awareness
Initiative Name	Forecast of a fire risk index, fire potential index, or similar
Description	To ensure that operational team members are aware of conditions which could favor spread of ignition it is important that such conditions are rationalized, and where appropriate, quantified and then communicated to throughout organization to enable proper mitigation takes place. This approach is also discussed in Section 5.3.1.6 as part of the weather monitoring function, which is found to have correlation to conditions in which ignition could result in fire spread.
Timeline to Minimize Risk [Planned/ Implemented]	Implemented
Rationale for Program	Developing readily-understood indications of metrics that correlate to elevated fire risk provides guidance for operating personnel to consider as they undertake their daily activities. Such metrics can play an important role in limiting operations that could be inappropriate under elevated fire risk conditions but would otherwise be considered accepted good practice and environmentally benign.
Prioritization Approach	Tier 3 areas, and those facilities electrically-connected to Tier 3 are highest priority while Tier 2 and Zone 1 areas are next highest priority. Non-tier areas are considered lowest fire mitigation risk priority.
Plan for audits/quality checks	In 5.3.1.6 PacifiCorp identified that its data was evaluated by fire science and weather professionals, and subsequently operationalized by weather professionals. No additional plan for audits of the data have been prepared, however the company is prepared to share its findings and experiences with any interested parties.
Planned demonstration of effectiveness over time	In 5.3.1.6 PacifiCorp asserted the effectiveness of this approach is demonstrated through its performance during fire season 2019, but anticipates that the metrics it proposed in its data collection plan, in addition performance shown in Table 2 indicates the effectiveness of the approach.

Planned Evolution	General	While PacifiCorp doesn't currently plan to create a single metric serving as a Fire Potential Index (or FPI), as its plans evolve, if such a need becomes apparent through feedback from operations team members, Public Safety Partners or other stakeholders it will consider such development. Generally however the company is concerned that various indices that have specific purpose (such as a Red Flag Warning meaning certain alert for fire suppression personnel), such an index could be broadly interpreted and perhaps misapplied. To the extent that a single index dictates specific actions and provides clarity to others about those expected actions, this can be beneficial, but if there is any element of subjectivity it can result in the index having limited value, and perhaps lead to greater confusion.
	Before the upcoming wildfire season	As stated in 5.3.1.6, re-evaluate weather independent variables for recent fire history environmental conditions.
	Before the next annual update	As stated in 5.3.1.6, assess approach and determine continued viability of method.
	Within the next 3 years	As stated in 5.3.1.6, assess approach and determine continued viability of method.
	Within the next 10 years	As stated in 5.3.1.6, assess approach and determine continued viability of method.

5.3.2.5 Personnel monitoring areas of electric lines and equipment in elevated fire risk conditions

Program Name	Situational Awareness
Initiative Name	Personnel monitoring areas of electric lines and equipment in elevated fire risk conditions
Description	During elevated risk periods operational staff and support staff may be activated to monitor equipment including lines and specific components to ensure safe operation during the exposure window. Section 5.3.6.3 also discusses additional resource utilized during elevated fire risk conditions.
Timeline to Minimize Risk [Planned/ Implemented]	Implemented
Rationale for Program	In order to limit the risk of ignition due to utility equipment but continue to serve customers during these periods establishing methods for monitoring the condition of the electrical equipment during the elevated risk periods is important. Such an action would be a potential alternate to PSPS, until such time that system hardening activities have been completed.
Prioritization Approach	Areas that are candidates for PSPS are the highest priority, which generally applies to Tier 3 areas, and those facilities electrically-connected to Tier 3. If a localized risk outside of Tier 3 were identified it would be weighed for the duration and extent of scope to critical and non-critical customers would be considered to evaluate priority. To the extent Mutual Assistance Agreements would need to be exercised to ensure appropriate coverage (once PacifiCorp resources are no longer able to be utilized) such agreements would be enacted.
Plan for audits/quality checks	No plans for audit or quality checks have been identified.
Planned demonstration of effectiveness over time	The effectiveness of this approach is demonstrated through its performance shown in Tables 2, 3, 8 and 12.

Planned Evolution	General	As the industry evolves with technology enhancements, PSPS experiences and is complemented by advancements of Public Safety Partners in their management of fire risks alteration of this strategy may occur. Such modifications to the approaches will, however, be communicated to stakeholders through PSPS updates with communities and Public Safety Partners.
	Before the upcoming wildfire season	Prepare operational and support teams to activation process.
	Before the next annual update	Evaluate effectiveness of real-time monitoring function, determine needed changes and inform stakeholders.
	Within the next 3 years	Evaluate effectiveness of real-time monitoring function, determine needed changes and inform stakeholders.
	Within the next 10 years	Evaluate effectiveness of real-time monitoring function, determine needed changes and inform stakeholders.

5.3.2.6 Weather forecasting and estimating impacts on electric lines and equipment

Program Name	Situational Awareness
Initiative Name	Weather forecasting and estimating impacts on electric lines and equipment
Description	As weather evolves, understanding the probability of extreme events that could result in fires or PSPS impacts is important to gauge how best to mitigate against such events. As such, when PacifiCorp developed its PSPS triggers as outlined in 5.3.1.6, it retrospectively applied those thresholds to determine what history could have been expected, thus articulating how impactful any such operations would be to customers.
Timeline to Minimize Risk [Planned/ Implemented]	Implemented
Rationale for Program	Evaluation of historical candidate PSPS levels allowed an assessment of whether it was a highly likely or very unlikely occurrence, enabling estimation of customer hours of PSPS interruption.
Prioritization Approach	Tier 3 areas, and those facilities electrically-connected to Tier 3 are highest priority while Tier 2 and Zone 1 areas are next highest priority. Non-tier areas are considered lowest fire mitigation risk priority.
Plan for audits/quality checks	Comparison against threshold levels was conducted by fire science and weather professionals to verify the frequency, duration and extent of PSPS and shared with Public Safety Partners and communities during PSPS open houses.
Planned demonstration of effectiveness over time	PacifiCorp anticipates refreshing this analysis on a yearly basis.

Planned Evolution	General	As systems become more resilient to fire risks due to completion of system hardening plans such comparative metrics will become more challenging to provide generally, since location will play a substantial role in whether there remains expected risks with the more resilient utility equipment.
	Before the upcoming wildfire season	Communicate recent history of performance against thresholds to stakeholders.
	Before the next annual update	Review, modify thresholds as appropriate and validate history of performance against thresholds.
	Within the next 3 years	Review, modify thresholds as appropriate and validate history of performance against thresholds.
	Within the next 10 years	Review, modify thresholds as appropriate and validate history of performance against thresholds.

5.3.2.7 Other/not listed [only if initiative cannot feasibly be classified within those listed above]

Program Name	Situational Awareness
Initiative Name	Other/not listed [only if initiative cannot feasibly be classified within those listed above]
Description	PacifiCorp does not have any other situational awareness wildfire mitigation programs.

Table 22 below summarizes all elements of PacifiCorp's risk assessment and mapping wildfire mitigation program. For each program, where requested, 2019 plan values were included as N/A. The 2019 WMP did not include specific annual requirements and, therefore, PacifiCorp only provided the total proposed program units and costs. Including any 2019 plan values for WMP programs contemplated in the company's 2019 WMP would be confusing and not helpful in understanding progress or the company's overall programs as these values reflect the total multi-year program proposals.

Table 22: Situational awareness and forecasting

Initiative activity	year	Line miles to be treated	Spend/treated line mile	Ignition probability drivers targeted	Risk reduction	risk-spend efficiency	Other risk drivers addressed	Existing/new	Existing: What proceeding has reviewed program	If new: Memorandum account	In/exceeding compliance with regulations	Cite associated rule	Comments
1. Advanced weather monitoring and weather stations	2019 plan	NA	NA	Contact from object; All types of equipment/facility failure; Wire-to-wire contact/contamination; Other	N/A	N/A	N/A	New Proposed 2019	N/A	2019 WMP Memorandum Account	N/A (Supports structural loading cases for regular application)	GO95 Section IV	Generally uses micro stations with evaluation for RAWs-quality measurements
	2019 actual	10	\$12,834										
	2020	10	\$16,600										
	2021	10	\$13,000										
	2022	5	\$13,000										
	2020-2022 plan total	25	\$14,440										
2. Continuous monitoring sensors	2019 plan	NA	NA	Contact from object; All types of equipment/facility failure; Wire-to-wire contact/contamination; Other	N/A	N/A	N/A	New Proposed 2020	N/A	2019 WMP Memorandum Account	Exceeds Regulation	GO95 Generally	Expansion of technology contingent of successful pilot experiences
	2019 actual	0	0										
	2020	4	\$28,000										
	2021	8	\$28,000										
	2022	12	\$28,000										
	2020-2022 plan total	24	\$28,000										
3. Fault indicators for detecting faults on electric lines and equipment	2019 plan	While this program is critical to facilitate situational awareness, the overall management of this program is better suited with PacifiCorp’s grid design and system hardening program focused on system automation, additional details have been included in Section 5.3.3.9. Costs and timelines for this program were outlined in Table 23, Initiative Activities 2.											
	2019 actual												
	2020												
	2021												
	2022												
	2020-2022 plan total												

Initiative activity	year	Line miles to be treated	Spend/treated line mile	Ignition probability drivers targeted	Risk reduction	risk-spend efficiency	Other risk drivers addressed	Existing/new	Existing: What proceeding has reviewed program	If new: Memorandum account	In/exceeding compliance with regulations	Cite associated rule	Comments
4. Forecast of a fire risk index, fire potential index, or similar	2019 plan	At this time PacifiCorp has not established a plan to develop a fire risk index beyond that which it is communicated in its 2019 and 2020 WMPs. In addition, no specific incremental spend has been identified.											
	2019 actual												
	2020												
	2021												
	2022												
	2020-2022 plan total												
5. Personnel monitoring areas of electric lines and equipment in elevated fire risk conditions	2019 plan	Additional resources deployed during elevated fire risk conditions is captured in section 5.3.6.3.											
	2019 actual												
	2020												
	2021												
	2022												
	2020-2022 plan total												
6. Weather forecasting and estimating impacts on electric lines and equipment	2019 plan	N/A	NA	Contact from object; All types of equipment/ facility failure; Wire-to-wire contact/contamination; Other	N/A	N/A	Mini mizes PSPS impac ts to custo mers	New Proposed 2019	N/A	2019 WMP Memora ndum Account	In/Exceeds Regulation	ESRB-8	Persists approach applied during 2019 fire season; retained forecasting firm with company-establish thresholds
	2019 actual												
	2020												
	2021												
	2022												
	2020-2022 plan total												
7.Other/not listen [only is an initiative cannot feasibly be classified within those listen above]	2019 plan	At this time, PacifiCorp does not have any specific situation awareness and forecasting programs focused not included in other programs.											
	2019 actual												
	2020												
	2021												
	2022												
	2020-2022 plan total												

5.3.3 *Grid design and system hardening*

PacifiCorp's electrical infrastructure is engineered, designed, and operated in a manner consistent with prudent utility practice, enabling the delivery of safe, reliable power to all customers. When installing new assets, PacifiCorp is committed to incorporating new technology and engineered solutions. When conditions warrant, PacifiCorp may engage in strategic system hardening, which PacifiCorp interprets to mean replacement of existing assets (or, in some circumstances, modifying existing assets using a new design and additional equipment) to make the assets more resilient. Specific to PacifiCorp's 2020 Wildfire Risk Mitigation Plan, grid design and system hardening are the use of enhanced programs or non-standard designs to specifically manage the electrical distribution and transmission system in high fire threat geographic locations to mitigate wildfire risk.

PacifiCorp's wildfire mitigation system hardening programs are designed in reference to the equipment on the electrical network which could be involved in the ignition of a wildfire or could be suspect to a wildfire event, such as a brush fire, and, therefore, require greater resilience in design. In general, system hardening programs attempt to reduce the occurrence of events involving the emission of sparks (or other forms of heat) from electrical facilities or enhance resilience to survive a fire event. No single program mitigates all wildfire risk related to all types of equipment. Individual programs address different factors, different circumstances, and different geographic areas. For example, one program might specifically focus on reducing the potential of arcing between two lines. Another program, however, might involve a systematic reconstruction of an entire line in a particular geographic area of concern, including use of non-wood poles, to support restoration efforts. Each program described below, however, shares the common objective of reducing overall wildfire risk associated with the design and type of equipment used to construct and operate electrical facilities.

Examples of such programs which are covered in greater detail in this section include installation of non-standard covered conductor, installation of advanced protection, control, and isolation schemes, and use of non-standard pole material specifications and parameters such as fiberglass in place of wood. For each program requested, PacifiCorp focused on wildfire mitigation specific components or initiatives that required additional funding, development, or tracking. Where an existing program was deemed sufficient or where PacifiCorp did not have a wildfire mitigation specific program, notes were included.

1. Routine maintenance programs and protocols (i.e. covering general maintenance approach and programmatic structure)

PacifiCorp interprets routine maintenance programs and protocols as it relates to grid design and system hardening to mean all non-inspection related planned, preventative maintenance activities as inspection related maintenance items are included in Section 5.3.4. PacifiCorp leverages a combination of policies, processes, procedures, and tools to identify, schedule, and complete non-inspection related planned and preventative maintenance activities, which are generally focused on either keeping the asset in good working condition, diagnosing the asset condition and need for repairs, or a combination of both. Examples of routine maintenance activities include the collection and analysis of oil samples from substation transformers, routine operation, cleaning, and battery replacement of circuit breakers, and functional inspection and battery

replacement of field reclosers. The oil sampling analysis provides insight into whether or not the transformer is showing signs of deterioration and requires repairs while the circuit breaker and recloser maintenance inform repair work and ensure the equipment continues to be in good working condition.

PacifiCorp's policies, which prescribe maintenance cycles and requirements, are generally the result of either state specific codes, balancing authority requirements, national electric codes, or industry best practices. Generally speaking, a "best practice" does not have a finite definition, unit of measure, or specific threshold; also it is not necessarily the optimum process but rather intended to include acceptable practices, methods or acts. It is, instead, a practice established by the culmination of assessment which generally includes one or more of; industry methods analysis (as may be supported through IEEE, NESC, NERC, WECC or other technical organizations in addition to peer validation), validation of individuals having standing by virtue of years of experience of qualified personnel, continuous improvement, or cross collaboration throughout the industry. As best practices are also informed by research results or technological advancements, they are flexible to evolve over time and reflect updates. Therefore, an expected level of subjectivity and fluidity is present in these policies and requirements where applicable.

Generally speaking, these non-inspection preventative maintenance activities are scheduled and planned in SAP, one of PacifiCorp's available tools for maintenance planning, work orders and work plans are created at the beginning of the year, work is scheduled by local operations managers and then centrally tracked to completion. Standard forms are used for each type of routine maintenance to capture the scope of work completed as well as relevant results or findings. These forms are stored in a central repository.

2. Non-Routine maintenance

PacifiCorp interprets non-routine maintenance as it pertains to grid design and system hardening as non-inspection related corrective or repair activities not associated with a major storm or major event, but could include corrective work due to isolated weather related events such as lightning. Inspection related maintenance items are included in Section 5.3.4. PacifiCorp's electrical infrastructure is engineered, designed, and operated in a manner consistent with prudent utility practice, enabling the delivery of safe, reliable power to all customers. However, over time, as a result of various circumstances, facilities placed in service may wear, break, become damaged by third parties or incidental contact, or otherwise be affected such that the facilities cannot operate per design. In these circumstances, PacifiCorp must perform non-routine maintenance to bring equipment back into proper working condition.

2.a. Emergency response maintenance/repair and

While PacifiCorp's intent is to perform maintenance activities to prevent failure and subsequent outages to customers, circumstances may still arise where either equipment failure is due to unforeseen circumstances such as third party damage and lightning events or where accurate and prudent diagnostics beyond visual inspection are not available to properly predict failure. In this case, a fault event or system abnormal condition

is detected at PacifiCorp's central grid operation center and resources are immediately dispatched to repair equipment and restore electrical service and system normal conditions.

Once at the site of the fault or equipment mis-operation, qualified personnel work quickly to identify and repair any damage in a methodical and systematic manner as to not exacerbate the situation or compromise worker or public safety. Wildfire emergency specific response programs and operational practices that facilitate this are further described in Section 5.3.6. As is expected, priority is given to emergency restoration or maintenance activities to restore electrical service to customer and maintain system normal conditions. Very little subjectivity exists in the identification and completion of emergency maintenance or repair activities, as the need is generally identified through detection of a fault event or abnormal operating conditions, which are all measureable activities. Similarly, effective completion of the activity results in restoration of service.

2.b. Inspection response maintenance/repair

As described above, routine maintenance activities performed are generally focused on either keeping the asset in good working condition, diagnosing the asset condition and need for repairs, or a combination of both. When the maintenance activity includes a diagnostic component, results are recorded and reviewed by qualified personnel to determine the necessity and urgency of any required repair work.

Qualified personnel may include operations staff when evaluating on-site results such as the failure of a breaker to operate or centralized engineering and technical support staff when performing an engineering analysis of Dissolved Gas Analysis (DGA) testing of the oil in a transformer. Craft personnel may assess and subsequently repair the circuit breaker on-site to be placed back in service or request full asset replacement depending on the extent of the damage and the specific reason for failure to operate. Similarly, in the case of DGA testing, the results of diagnostic gas analysis are reviewed by engineering and technical support and then categorized as either (1) extreme, requiring immediate corrective action, (2) elevated, requiring follow up testing and monitoring, or (3) normal, requiring no corrective action or repair work.

While there can be subjectivity into the evaluation and categorization of results of maintenance activities, PacifiCorp generally uses a combination of industry accepted best practices, sound engineering judgement, and experienced based operations knowledge. The use of standardized forms and centralized teams where applicable does reduce the range of accepted practices and evaluation techniques and bounds the potential results and corrective actions.

5.3.3.1 Capacitor maintenance and replacement program

Program Name	Grid design and system hardening
Initiative Name	Capacitor maintenance and replacement program
Description	At this time, PacifiCorp does not have a specific grid design and system hardening wildfire mitigation program focused on capacitor maintenance and replacement. Capacitor replacement and maintenance is included in the company's standard inspection, maintenance, and replacement protocols. Any enhanced inspections or accelerated correction timeframe/replacements are captured in Section 5.3.4.3, Improvement of inspections.

5.3.3.2 Circuit breaker maintenance and installation to de-energize lines upon detecting a fault

Program Name	Grid design and system hardening
Initiative Name	Circuit breaker maintenance and installations to de-energize lines upon detecting a fault
Description	<p>At this time, PacifiCorp does not have a specific grid design and system hardening wildfire mitigation program focused on circuit breaker maintenance and replacement.</p> <p>Circuit breakers are generally installed for all distribution circuits and transmission lines to detect fault current and protect equipment in the event that a fault is detected. Circuit breaker replacement and maintenance is included in the company's standard inspection, maintenance, and replacement protocols.</p> <p>Any enhanced inspections or accelerated correction timeframe/replacements are captured in Section 5.3.4.3, Improvement of inspections.</p> <p>Replacement of specific, targeted circuit breakers as a part of PacifiCorp's WMP to support overall advanced coordination and detection efforts are better captured in initiative 5.3.3.9, Installation of system automation equipment.</p>

5.3.3.3 Covered conductor installation

PacifiCorp interprets the covered conductor installation wildfire mitigation program to include the proactive replacement of existing in-service lines with covered conductor on both applicable distribution and transmission lines. These programs are meant to cover multiple relevant technologies such as Hendrix cable or spacer cable and include all elements required to design and install, such as but not limited to materials, engineering, circuit coordination review, hardware, connectors, and installation/construction. For the purposes of this document, these programs have been collectively described and then further separated into both transmission and distribution voltage classes in Table 23.

Program Name	Grid design and system hardening																																	
Initiative Name	Covered conductor installation (transmission & distribution)																																	
Description	<p>PacifiCorp's grid design and system hardening wildfire mitigation program focused on covered conductor installation includes replacement of existing single phase, two phase, and three phase overhead distribution and transmission conductor within the HFTD with insulated conductor solutions such as insulated cable, spacer cable, and crossarm insulation. The program is phased across 5 years, with the first year focused on engineering and program start up. The high level scope of this program includes the following:</p> <table border="1"> <thead> <tr> <th>Component</th><th>Total Program</th><th>2019³⁷</th><th>2020</th><th>2021</th><th>2022</th><th>2023</th></tr> </thead> <tbody> <tr> <td>Distribution (line-miles)</td><td>165</td><td>0</td><td>38</td><td>52</td><td>41</td><td>34</td></tr> <tr> <td>Transmission (line-miles)</td><td>24</td><td>0</td><td>0</td><td>8</td><td>8</td><td>8</td></tr> <tr> <td>Total (line-miles)</td><td>189</td><td>0</td><td>38</td><td>60</td><td>49</td><td>42</td></tr> </tbody> </table> <p>The program includes all necessary components to install the preferred solution such as but not limited to materials, engineering, circuit coordination review, hardware, and installation/construction. This program also include the construction and installation of spacer cable consistent with NESC requirements.</p>						Component	Total Program	2019 ³⁷	2020	2021	2022	2023	Distribution (line-miles)	165	0	38	52	41	34	Transmission (line-miles)	24	0	0	8	8	8	Total (line-miles)	189	0	38	60	49	42
Component	Total Program	2019 ³⁷	2020	2021	2022	2023																												
Distribution (line-miles)	165	0	38	52	41	34																												
Transmission (line-miles)	24	0	0	8	8	8																												
Total (line-miles)	189	0	38	60	49	42																												
Timeline to Minimize Risk [Planned/ Implemented]	Planned																																	

³⁷ 2019 efforts focused on development of engineering standard and detailed scoping.

<p>Rationale for Program</p>	<p>PacifiCorp currently engineers, constructs, and operates overhead conductor consistent with company standards which account for the necessary electrical loading as well as structural competence under standard operating conditions. However, as demonstrated in the risk assessment, overhead distribution conductor can be susceptible to incidental contact with foreign objects or phase to phase contact which, under certain conditions, can result in a fault scenario. During fire season, these fault scenarios pose wildfire risk, because arcing associated with the fault could ignite a fire.</p> <p>Because of the different fault scenarios associated with different configurations of overhead distribution assets, PacifiCorp’s covered conductor installation programs include specific solutions for single phase, two phase, and three phase configurations.</p> <p>Reconductor with Insulated Cable: While not part of standard prudent utility construction practices, specialized overhead insulated conductors can be constructed with additional shielding and enhanced insulating properties. Insulated cable has less susceptibility to incidental contact with foreign objects such as branches or Mylar balloons. While insulated cable does not prevent incidental contact from occurring, it reduces the potential that incidental contact will result in a fault event, thereby reducing the wildfire risk. Therefore, PacifiCorp’s program includes installing insulated cable on all single phase overhead conductor circuits within the HFTD.</p> <p>Spacer Cable Installation: As previously described, overhead three phase conductors can be susceptible to external factors, such as high winds which result in phase to phase contact and a potential fault scenario. Spacer cable can be installed on multi-phase installations to provide additional rigidity, hold the multiple phases apart, and reduce the probability that phase to phase contact can occur. Therefore, PacifiCorp’s program includes installing spacer cable on multi-phase overhead conductor circuits within the HFTD.</p> <p>Crossarm Installation: Where weight precludes the installation of spacer cable, insulated conductor can be installed on the cross arm for a similar risk reducing effect. Therefore, PacifiCorp’s covered conductor installation program includes the installation of insulated conductor on all V phase cross-arms within the HFTD.</p>
<p>Prioritization Approach</p>	<p>As with all grid design and system hardening programs, PacifiCorp prioritizes the location of work to be completed and includes all elements of the plan at those locations instead of prioritizing specific programs or initiatives. Tier 3 and Tier 2 activities are given the highest priority and all program elements planned on a given line or circuit in that location are combined into a project. This ensures that risk is mitigated in the highest risk geographic locations first and facilitates efficiency in planning and execution.</p>

		Specific to the prioritization of covered conductor installation, PacifiCorp's general methodology included selecting locations where the dominant fire weather was experienced in 2019 and the installation of covered conductor can reduce the potential for a PSPS event. Furthermore, PacifiCorp took into consideration the constructability, such as the requirement to complete hardening of the backbone prior to any radial sections or taps as well as the location of critical customers and load centers. This prioritized the location of 2020 activity and will inform the 2021 and 2022 scope of work. As PacifiCorp's situational awareness and weather data accuracy improves, PacifiCorp may further refine this methodology.
Plan for audits/quality checks		<p>Where applicable, PacifiCorp intends to use standard company policies and procedures to implement audits/quality checks of its grid design and system hardening wildfire mitigation programs. Examples of these policies and procedures include but are not limited to development and use of detailed engineering standards, thorough peer/panel review of engineering design prior to approval, rigorous and competitive procurement processes, and use of qualified personnel for construction.</p> <p>PacifiCorp recently formed a Wildfire Mitigation Delivery Project Management Office within the transmission and distribution operations department and assigned a Wildfire Mitigation Delivery Director to lead the effort. The Wildfire Mitigation Implementation PMO will be responsible for planning, tracking, completion, and quality assurance of PacifiCorp's grid design and system hardening programs. While this department remains in its early stages and is not yet fully formed, the office intends to explore and develop a quality assurance process throughout the life cycle of the programs, specifically focused on the construction phase of these programs. Potential solutions currently under consideration might include the use of qualified inspectors, standardized forms and evaluations, or random sampling and inspection by the Wildfire Mitigation Delivery Director. PacifiCorp anticipates that this aspect of the program will evolve quickly and intends to provide additional updates and detail in the company's first annual update in 2021.</p>
Planned demonstration of effectiveness over time		Similar to all grid design and system hardening wildfire mitigation programs, effectiveness of the covered conductor program includes a reduction in outage events, specifically those relating to incidental contact. As a reduction in potential fault events correlates to a reduction in potential ignition scenarios, an effective covered conductor program will mitigate the potential of incidental contact to result in a fault scenario and potential ignition.
Planned Evaluation	General	While PacifiCorp maintains its commitment to deliver the company's wildfire mitigation programs and projects as proposed, it is critical to recognize that, as these projects and programs are subject to continuous evaluation in an effort to drive continuous improvement, specifics may need to change and adapt to moving market conditions, resource constraints, and lessons learned. PacifiCorp intends to keep a close eye on these potential changes, which the company will incorporate into future Off-Ramp filings.

		As PacifiCorp continues to implement its multi-year WMP, the company will continue to evaluate how various grid design and system hardening programs may be improved by either changes to scope, technology, timing, or prioritization.
	Before the upcoming wildfire season	No expected/planned evolution at this time.
	Before the next annual update	No expected/planned evolution at this time.
	Within the next 3 years	No expected/planned evolution at this time.
	Within the next 10 years	As PacifiCorp is early in the implementation of its multi-year WMP, it is challenging to know specifically how and when the company's covered conductor program will evolve. However, the company anticipates that modification or evolution could occur within the next 10 years but most likely to take place beyond the 3 year timeframe.

5.3.3.4 Covered conductor maintenance

Program Name	Grid design and system hardening
Initiative Name	Covered conductor maintenance
Description	At this time, PacifiCorp does not have any grid design and system hardening programs focused on covered conductor maintenance. As PacifiCorp progresses with implementation of the company wildfire mitigation programs, the company will continue to evaluate covered conductor specific wildfire mitigation maintenance programs.

5.3.3.5 Crossarm maintenance, repair, and replacement

Program Name	Grid design and system hardening
Initiative Name	Crossarm maintenance, repair, and replacement
Description	<p>At this time, PacifiCorp does not have a specific grid design and system hardening wildfire mitigation program focused on crossarm maintenance, repair, and replacement.</p> <p>Routine crossarm maintenance, repair, and replacement are included in the company's standard inspection and correction programs, with an accelerated timeline for correction under the company's Inspection program improvement, Section 5.3.4.3.</p>

5.3.3.6 Distribution pole replacement and reinforcement, including with composite poles

PacifiCorp's pole replacement and reinforcement programs include both transmission and distribution poles. The methodology and general program approach are the same, but the specific volume of assets to be replaced and expenditure is different. For the purposes of this filing, the programs have been described below and the separately accounted for in Table 23.

Program Name	Grid design and system hardening						
Initiative Name	Distribution (and transmission) pole replacement and reinforcement, including with composite poles						
Description	PacifiCorp's distribution and transmission pole replacement and reinforcement program includes both the incorporation of new engineering fiberglass specification for new construction/installations within the HFTD as well as accelerated proactive replacement of existing wooden structures within the HFTD with non-wooden solutions outside of existing inspection and replacement programs described in Section 5.3.4.1, Section 5.3.4.2, and Section 5.3.4.6.						
	Year	Total Program	2019 ³⁸	2020	2021	2022	2023
	Distribution (poles)	1,600	0	39	300	300	961
	Transmission (poles)	2,400	0	150	180	180	1,890
	Total (poles)	4,000	0	189	480	480	2,851
Timeline to Minimize Risk [Planned/ Implemented]	Planned & Partial Implementation <ul style="list-style-type: none"> Completed evaluation of technical specification options Implemented new fiberglass pole standard for new construction within the HFTD Begin phased implementation of proactive replacement in 2020 (multi-year program) Scope of full proactive replacement currently in progress 						
Rationale for Program	Currently, overhead poles and pole mounted equipment are replaced or reinforced within PacifiCorp's service territory, consistent with state specific requirements and prudent utility practice. Subject poles are identified through routine inspection and testing, major weather events, or joint use accommodation projects.						

³⁸ 2019 efforts focused on development of engineering standard and detailed scoping.

	<p>Traditionally, when a pole is identified for replacement through routine testing and inspections, a new wooden pole suitable for the intended use and design is installed in its place. While the use of wooden poles is consistent with prudent utility practice and considered safe and structurally sufficient to support overhead electrical facilities during standard operating conditions, alternate construction such as steel or fiberglass can provide additional structural resilience during wildfire events and, therefore, aid in restoration efforts.</p> <p>Accelerating the replacement of wooden poles with non-wooden solutions within the HFTD in addition to condition-based replacement can improve vintage diversity for adjacent pole loading, improve overall structural resilience, reduce wildfire risk, and support restoration efforts should a wildfire event happen.</p> <p>Furthermore, over time, joint use services have been permitted to attach to utility wooden poles within the existing safety factor margin designed for utility use only, effectively reducing the actual engineering safety factor. Proactive installation of new non-wooden poles with enhanced structural capability works to re-establish this original safety factor as designed.</p>
Prioritization Approach	<p>As with all grid design and system hardening programs, PacifiCorp prioritizes the location of work to be completed and includes all elements of the various programs at those locations instead of prioritizing specific programs or initiatives. Tier 3 and Tier 2 activities are given the highest priority and all program elements planned on a given line or circuit in that location that can be worked in parallel are combined into a project. This ensures that risk is mitigated in the highest risk geographic locations first and facilitates efficiency in planning and execution.</p> <p>Specific to PacifiCorp's pole replacement program, PacifiCorp first prioritizes pole replacements coincident to other planned programs or projects such as installation of covered conductor or replacement of Cu conductor (See Sections 5.3.3.3, 5.3.3.18). As these other programs target Tier 3 and Tier 2 locations as well as locations that are most likely to experience a PSPS event, the pole replacement program will essentially prioritize replacement of poles within Tier 3 and Tier 2 initially with a focus on mitigating potential PSPS events. Further criteria is then applied to this subset of PacifiCorp's poles and these poles are replaced based on age, condition, pole loading calculation and modeling, and overall diversity on the circuit or line.</p> <p>Beyond where coincident with other programs, PacifiCorp will apply a further prioritization method to identify where pole replacement should take place as a stand-alone project beyond CY2020. This prioritization methodology takes into consideration geographic wildfire tier designation, outstanding conditions, age, age diversity, pole loading calculation and modeling, presence of joint use attachments and presence of distribution underbuild.</p>

Plan for audits/quality checks		<p>Where applicable, PacifiCorp intends to use standard company policies and procedures to implement audits/quality checks of its grid design and system hardening wildfire mitigation programs. Examples of these policies and procedures include but are not limited to development and use of detailed engineering standards thorough peer/panel review of engineering design prior to approval, rigorous and competitive procurement processes, and use of qualified personnel for construction.</p> <p>PacifiCorp recently formed a Wildfire Mitigation Delivery Project Management Office within the Transmission and Distribution Operations department and assigned a Wildfire Mitigation Delivery Director to lead this effort. The Wildfire Mitigation Implementation PMO will be responsible for planning, tracking, completion, and quality assurance of PacifiCorp's grid design and system hardening programs. While this department remains in its early stages and is not yet fully formed, the office intends to explore and develop a quality assurance process throughout the life cycle of the programs, specifically focused on the construction phase of these programs. Potential solutions currently under consideration might include the use of qualified inspectors, standardized forms and evaluations, or random sampling and inspection by the Wildfire Mitigation Delivery Director. PacifiCorp anticipates that this aspect of the program will evolve quickly and intends to provide additional updates and detail in the company's first annual update in 2021.</p>
Planned demonstration of effectiveness over time		<p>This programs aims to improved structural resilience to either prevent pole failure during severe conditions or survive a wildfire event and support quicker, safer restoration efforts. Therefore, planned demonstration of effectiveness is a generally downward trend in pole related failures either before or during a wildfire event.</p>
Planned Evolution	General	<p>While PacifiCorp maintains its commitment to deliver the company's wildfire mitigation programs and projects as proposed, it is critical to recognize that, as these projects and programs are subject to evaluation in an effort to drive continuous improvement, specifics may need to change and adapt to moving market conditions, resource constraints, and lessons learned. PacifiCorp intends to keep a close eye on these potential changes, which the company will incorporate into future Off-Ramp filings.</p> <p>As PacifiCorp continues to implement its multi-year WMP, the company will continue to evaluate how various grid design and system hardening programs may be improved by either changes to scope, technology, timing, or prioritization. As PacifiCorp is early in the implementation of its multi-year WMP, it is challenging to know specifically how and when the company's pole replacement program will evolve. However, the company anticipates that modification or evolution is most likely to take place after the next three years of implementation.</p>

	Before the upcoming wildfire season	No expected/planned evolution at this time.
	Before the next annual update	No expected/planned evolution at this time.
	Within the next 3 years	No expected/planned evolution at this time.
	Within the next 10 years	Potential for evolution beyond the 3+ year timeframe which could potential include the use alternate technology or expansion and broadening of scope.

5.3.3.7 Expulsion fuse replacement

Program Name	Grid design and system hardening
Initiative Name	Expulsion fuse replacement
Description	<p>Overhead expulsion fuses serve as one of the primary system protection devices on the overhead system. The expulsion fuse has a small metal element within the fuse body that is designed to melt when excessive current passes through the fuse body, interrupting the flow of electricity to the downstream distribution system. Under certain conditions, the melting action and interruption technique will expel an arc out of the bottom of the fuse tab. To reduce the potential for ignition as a result of fuse operation, PacifiCorp has identified alternate methodologies and equipment that do not expel an arc for installation within the HFTD.</p> <p>PacifiCorp's overhead expulsion fuse replacement program includes incorporation of a new engineering standard to be applied to new construction projects throughout the HFTD as well as proactive replacement of existing in-service expulsion fuses along with other system hardening projects throughout the HFTD (such as covered conductor or pole replacements). The new engineering standard is completed and has been incorporated into new construction projects.</p> <p>Replacement of in-service overhead expulsion fuses requires installation of new overhead equipment and potentially replacement of or augmentation to other protection and control equipment on a given circuit. Therefore, as opposed to initiating a separate program, PacifiCorp is incorporating this element into other system hardening programs to embrace maximum planning and spend efficiency (pole replacement, covered conductor replacement, advanced coordination, etc.).</p> <p>PacifiCorp will continue to evaluate the need for an additional, stand-alone overhead expulsion fuse program should all fuses not be replaced through other programs. At that time, these fuses will most likely be evaluated and prioritized based on geographic location and overall wildfire risk (Tier 3/II/Zone 1) for replacement.</p> <p>As part of the company's 2019 WMP vegetation management programs, PacifiCorp's radial pole clearing program was expanded. This supplemental vegetation management program helps mitigate the potential risk and impact of overhead expulsion fuses by reducing the available fuel at the base of the pole, along with similar risks from other overhead equipment, within the HFTD until alternate devices can be installed as a part of the broader programs.</p>

5.3.3.8 Grid topology improvements to mitigate or reduce PSPS events

Program Name	Grid design and system hardening
Initiative Name	Grid topology improvements to mitigate or reduce PSPS events
Description	<p>The totality of the company's wildfire mitigation programs include, as a component, improvements to mitigate or reduce PSPS events. Examples of such programs include the installation of covered conductor, installation and operation of weather stations, or enhanced inspections and corrections. While the company's many wildfire mitigation programs are designed and focused to reduce the overall wildfire risk, PacifiCorp anticipates that, as these programs evolve, an additional benefit may be realized through the reduction of potential PSPS events.</p> <p>However, PacifiCorp interprets the grid topology improvements to mitigate or reduce PSPS events to be specific program components which mitigate either the frequency, duration, or overall impact of PSPS events not included in other wildfire mitigation programs such as those noted above.</p> <p>As many of PacifiCorp's points of delivery (customers) reside within the HFTD and PSPS zones, it is challenging to mitigate or reduce the entire existence of a PSPS event through grid topology improvements alone. Therefore, efficient and effective grid topology improvements mitigate or reduce PSPS events in the company's service territory to focus on augmentation or evaluation of existing circuitry as opposed to complete relocation of assets.</p> <p>While PacifiCorp did not implement a PSPS event in the state of California during the 2019 fire season, PacifiCorp did monitor elevated risk conditions throughout the year when required to remain vigilant and maintain the capacity to implement a PSPS event. During these time periods, PacifiCorp learned that the ability to efficiently and effectively implement a PSPS event within the company's service territory in a manner that keeps the impact to customers and communities as low as practical is about flexibility, system knowledge, and the capability to make informed decisions based on accurate information to task appropriate action in the moment.</p> <p>As a result, PacifiCorp's grid topology improvements to mitigate or reduce PSPS events will focus on the evaluation of various scenarios within the company's pre-defined PSPS zones to understand what projects may be able to promote this flexibility and inform decision making. As 2019 represents the first year of PacifiCorp's PSPS program, the company does not yet have a defined list of mitigation projects. PacifiCorp anticipates that as this program evolves, these projects may include proactive installation of equipment but also recognizes that as weather patterns and risk can change quickly, specific proactive projects may not always be effective. Alternatively, the company may also look at enhance procedures and readiness to implement reactive switching or isolation points during an event.</p>

		In any case, PacifiCorp assumes these projects will be limited in scope and expenditure and may need to be considered on a case by case basis. At this time, no specific scope or budget has been set aside for this program.
Timeline to Minimize Risk [Planned/ Implemented]		Planned
Rationale for Program		PSPS events, while critical to reducing wildfire risk, can cause disruption to customers and communities. PacifiCorp's grid topology improvements to mitigate or reduce PSPS events program are developed to mitigate either the frequency, duration, or overall impact of PSPS events.
Prioritization Approach		High priority given to the program specifically focused within existing PSPS candidate zones described in Section 4.4.1.
Plan for audits/quality checks		N/A
Planned demonstration of effectiveness over time		The effectiveness of these programs is a reduction in frequency, duration, or overall impact of PSPS events. However, as PSPS has not yet implemented a PSPS, PacifiCorp has very little data to leverage and measurement of effectiveness of this program may be challenging. Additionally, as the implementation and evolution PacifiCorp's PSPS program is directly influenced by hazardous and high risk weather conditions, changing weather conditions may also make this a moving target as described in Section 4.4.7.
Planned Evolution	General	<p>While PacifiCorp maintains its commitment to deliver the company's wildfire mitigation programs and projects as proposed, it is critical to recognize that, as these projects and programs are subject to continuous evaluation in an effort to drive continuous improvement, specifics may need to change and adapt to moving market conditions, resource constraints, and lessons learned. PacifiCorp intends to keep a close eye on these potential changes, which the company will incorporate into future Off-Ramp filings.</p> <p>Additionally, as PacifiCorp continues to implement its multi-year WMP, the company will continue to evaluate how grid topology improvements to mitigate or reduce PSPS events may be improved by either changes to scope, technology, timing, or prioritization. As PacifiCorp is early in the implementation of its multi-year WMP, it is challenging to know specifically how and when the company's grid topology improvements to mitigate or reduce PSPS</p>

		events program will evolve. However, PacifiCorp anticipates that this program will evolve alongside the company's overall PSPS program as described in Section 4.4.7.
	Before the upcoming wildfire season	No evolution planned/anticipated at this time.
	Before the next annual update	Incorporation of localized weather data and enhanced situational awareness to influence projects
	Within the next 3 years	<ul style="list-style-type: none"> • Incorporation of relevant grid topology programs to mitigate the impact of a PSPS event • Evaluation of system hardening programs to include potential reduction of candidates or PSPS boundaries, amendment to threshold criteria, and, where appropriate, removal of the PSPS zone entirely • Incorporation of localized weather data and enhanced situational awareness to review risk profile and overall candidate selection
	Within the next 10 years	<ul style="list-style-type: none"> • Continued incorporation of relevant grid topology programs to mitigate the impact of a PSPS event • Evaluation of system hardening program completion to include potential reduction of candidates or PSPS boundaries, amendment to threshold criteria, and, where appropriate, removal of the PSPS zone entirely • Continues incorporation of localized weather data and enhanced situational awareness to review risk profile and overall candidate selection

5.3.3.9 Installation of system automation equipment

PacifiCorp interprets system automation equipment to mean all equipment, schemes, engineering, and processes to facilitate advance detection and coordination on the company's distribution circuits.

Program Name	Grid design and system hardening																			
Initiative Name	Installation of system automation equipment																			
Description	<p>PacifiCorp's installation of system hardening wildfire mitigation program includes the deployment of distribution and transmission protection and control schemes and equipment, such as relays, circuit breakers, reclosers, and communications equipment, to enhance fault detection capabilities, reduce fault isolation time, improve fault location and record availability, and expedite restoration efforts. Currently, the scope of this program includes 68 projects throughout the HFTD over four years, with completion of the program in 2022 as indicated below.</p> <table border="1"> <thead> <tr> <th>Component</th><th>Total Program</th><th>2019</th><th>2020</th><th>2021</th><th>2022</th><th>2023</th></tr> </thead> <tbody> <tr> <td>Projects</td><td>68</td><td>10</td><td>31</td><td>24</td><td>3</td><td>0</td></tr> </tbody> </table>						Component	Total Program	2019	2020	2021	2022	2023	Projects	68	10	31	24	3	0
Component	Total Program	2019	2020	2021	2022	2023														
Projects	68	10	31	24	3	0														
Timeline to Minimize Risk [Planned/ Implemented]	Planned and Partial Implementation (See Table 23)																			
Rationale for Program	<p>Advanced coordination refers to the upgrade and deployment of distribution protection and control schemes and equipment, such as relays, circuit breakers, reclosers, and communications equipment, to enhance fault detection capabilities, reduce fault isolation time, improve fault location and record availability, and expedite restoration efforts.</p> <p>While the existing protection and control equipment and schemes are consistent with prudent utility practice and are sufficient to safely operate the electric system under standard operating conditions, advance coordination can further reduce operational risk in specific scenarios. Specific to wildfire mitigation, advanced coordination can allow for the detection of high impedance faults, such as those consistent with brush fires, reduce fault isolation time and reduce potential exposure to ignition events, improve fault location and records to facilitate timely response to fire events and support continuous improvement, and can provide ability to remotely operate equipment, which is critical for PSPS efforts.</p>																			

Prioritization Approach	<p>As with all grid design and system hardening programs, PacifiCorp prioritizes the location of work to be completed and includes all elements of the plan at those locations instead of prioritizing specific programs or initiatives. Tier 3 and Tier 2 activities are given the highest priority and all program elements planned on a given line or circuit in that location are combined into a project. Specific to the installation of system automation equipment, the specific projects are prioritized based on the proportional amount of line miles exposed in Tier 3 and Tier 2 that are protected or controlled by the equipment proposed for upgrades and enhancements. Within that prioritization, additional consideration, where needed, was given to the type and vintage of existing equipment (such as relays) in the event that further prioritization and delineation was needed. This approach ensures that risk is mitigated in the highest risk geographic locations first and facilitates efficiency in planning and execution.</p>
Plan for audits/quality checks	<p>Where applicable, PacifiCorp intends to use standard company policies and procedures to implement audits/quality checks of its grid design and system hardening wildfire mitigation programs. Examples of these policies and procedures include but are not limited to development and use of detailed engineering standards, thorough peer/panel review of engineering design prior to approval, rigorous and competitive procurement processes, and use of qualified personnel for construction.</p> <p>PacifiCorp recently formed a Wildfire Mitigation Delivery Project Management Office within the transmission and distribution operations department and assigned a Wildfire Mitigation Delivery Director to lead the effort. The Wildfire Mitigation Implementation PMO will be responsible for planning, tracking, completion, and quality assurance of PacifiCorp's grid design and system hardening programs. While this department remains in its early stages and is not yet fully formed, the office intends to explore and develop a quality assurance process throughout the life cycle of the programs, specifically focused on the construction phase of these programs. Potential solutions currently under consideration might include the use of qualified inspectors, standardized forms and evaluations, or random sampling and inspection by the Wildfire Mitigation Delivery Director. PacifiCorp anticipates that this aspect of the program will evolve quickly and intends to provide additional updates and detail in the company's first annual update in 2021.</p>
Planned demonstration of effectiveness over time	<p>This programs aims to improve advanced detection, coordination, and protection schemes on PacifiCorp's circuits within the HFTD in California. Therefore, PacifiCorp views demonstration of effectiveness as a generally downward trend in protection and control mis-operation, faster isolation times during a fault event, greater resolution in fault location information during a fault event, and the availability of additional fault data after an event occurs.</p>

Planned Evolution	General	<p>While PacifiCorp maintains its commitment to deliver the company's wildfire mitigation programs and projects as proposed, it is critical to recognize that, as these projects and programs are subject to continuous evaluation in an effort to drive continuous improvement, specifics may need to change and adapt to moving market conditions, resource constraints, and lessons learned. PacifiCorp intends to keep a close eye on these potential changes, which the company will incorporate into future Off-Ramp filings.</p> <p>Additionally, as PacifiCorp continues to implement its multi-year WMP, the company will continue to evaluate how various grid design and system hardening programs may be improved by either changes to scope, technology, timing, or prioritization. As PacifiCorp is early in the implementation of its multi-year WMP, it is challenging to know specifically how and when the company's installation of system automation program will evolve. However, given how quickly advanced detection, protection, and control equipment is changing, the company anticipates that modification or evolution could take place in the 3 year timeframe, specifically regarding the communication methods and schemes.</p>
	Before the upcoming wildfire season	No expected/planned evolution at this time.
	Before the next annual update	No expected/planned evolution at this time.
	Within the next 3 years	Potential for evolution in the 3 year timeframe, most likely to incorporate changes to communication methods or schemes.
	Within the next 10 years	Continued evolution.

5.3.3.10 Maintenance, repair, and replacement of connectors, including hotline clamps

Program Name	Grid design and system hardening
Initiative Name	Maintenance, repair, and replacement of connectors, including hotline clamps
Description	PacifiCorp does not currently have a specific grid design and system hardening wildfire mitigation program focused on maintenance, repair, and replacement of connectors, including hotline clamps. Replacement of connectors, where applicable, is included in other programs such as installation of covered conductor.

5.3.3.11 Mitigation of impact on customers and other residents affected during PSPS event

Program Name	Grid design and system hardening
Initiative Name	Mitigation of impact on customers and other residents affected during PSPS event
Description	<p>PacifiCorp does not currently have an additional grid design and system hardening wildfire mitigation program focused on mitigation of impact on customers and other residents affected during PSPS event outside of the initiatives described in Section 5.3.3.8.</p> <p>Both of these programs are combined as relevant grid topology improvements pertaining to grid design and system hardening that reduce PSPS events inherently also mitigate the impact on customers. Furthermore, PacifiCorp's additional programs or efforts to mitigate the impact on customers and other residents affected during a PSPS event are described in Section 4.4 and Section 5.6.2.</p>

5.3.3.12 Other corrective action

Program Name	Grid design and system hardening
Initiative Name	Other corrective action
Description	At this time, PacifiCorp does not have any grid design and system hardening wildfire mitigation programs focused on other corrective action. PacifiCorp's relevant corrective actions are included in the company's Improvement of inspections in Section 5.3.4.3.

5.3.3.13 Pole loading infrastructure hardening and replacement program based on pole loading assessment program

Program Name	Grid design and system hardening
Initiative Name	Pole loading infrastructure hardening and replacement program based on pole loading assessment program
Description	<p>Pole loading to accommodate safety factors and necessary specifications are included in PacifiCorp's engineering and construction standards.</p> <p>At this time, PacifiCorp has piloted the use of LiDAR to create structural models to calculate pole loading capacity. In addition, specific pole loading assessment of in-service assets was included as a subset to the methodology of PacifiCorp's pole replacement programs included in Section 5.3.3.6. Where appropriate, pole loading assessment of new construction has also been incorporated into the new standards developed included in Section 5.3.3.6.</p>

5.3.3.14 Transformers maintenance and replacement

Program Name	Grid design and system hardening
Initiative Name	Transformers maintenance and replacement
Description	At this time, PacifiCorp does not have a specific grid design and system hardening wildfire mitigation program focused on transformer maintenance and replacement. Transformer replacement and maintenance is included in the company's standard inspection, maintenance, and replacement protocols. Any enhanced inspections or accelerated correction timeframe/replacements are captured in Section 5.3.4.3, Improvement of inspections.

5.3.3.15 Transmission tower maintenance and replacement

Program Name	Grid design and system hardening
Initiative Name	Transmission tower maintenance and replacement
Description	PacifiCorp does not have a specific grid design and system hardening wildfire mitigation program focused on transmission tower maintenance and replacement outside of standard inspection and correction programs describes in Section 5.3.4 or transmission pole replacement as included in Section 5.3.3.6.

5.3.3.16 Undergrounding of electric lines and/or equipment

Program Name	Grid design and system hardening
Initiative Name	Undergrounding of electric lines and/or equipment
Description	PacifiCorp recognizes that value may exist in installation of underground electrical equipment. However, in PacifiCorp's experience, undergrounding of electric utility lines tends to be less economical as compared to the installation of overhead electric lines, including the installation of covered conductor. Therefore, at this time, PacifiCorp does not have any grid design and system hardening wildfire mitigation programs specifically focused on undergrounding of electric lines and/or equipment. Should these conditions change, PacifiCorp,

5.3.3.17 Updates to grid topology to minimize risk of ignition in HFTDs

Program Name	Grid design and system hardening
Initiative Name	Updates to grid topology to minimize risk of ignition in HFTDs
Description	<p>At this time, PacifiCorp does not have any specific grid design and system hardening wildfire mitigation programs focus on updates to grid topology to minimize risk of ignition in HFTDs. PacifiCorp recognizes that, as weather patterns change and overall modeling and assessments evolve, updates to grid topology is something to continue to evaluate.</p> <p>Other grid design and system hardening programs include, as a component, grid topology improvements to minimize the risk of ignition in the HFTD. Similar to the company's grid topology improvement to mitigate or reduce PSPS events described in Section 5.3.3.8, PacifiCorp recognizes that it is challenging to mitigate wildfire risk through grid topology changes alone. Therefore, PacifiCorp focuses more on augmentation of existing circuitry through system hardening efforts included throughout Section 5.3.3.</p>

5.3.3.18 Other – Replace small size Cu conductor

Program Name	Grid design and system hardening																			
Initiative Name	Replace small size Cu conductor																			
Description	<p>The scope of this program includes the replacement of small diameter copper and iron conductors throughout PacifiCorp's California service territory with aluminum stranded conductor. A high level summary of the program scope is included below.</p> <table border="1"> <thead> <tr> <th>Component</th><th>Total Program</th><th>2019</th><th>2020</th><th>2021</th><th>2022</th><th>2023</th></tr> </thead> <tbody> <tr> <td>Distribution (line-miles)</td><td>53</td><td>0³⁹</td><td>3</td><td>26</td><td>13</td><td>11</td></tr> </tbody> </table>						Component	Total Program	2019	2020	2021	2022	2023	Distribution (line-miles)	53	0 ³⁹	3	26	13	11
Component	Total Program	2019	2020	2021	2022	2023														
Distribution (line-miles)	53	0 ³⁹	3	26	13	11														
Timeline to Minimize Risk [Planned/ Implemented]	Planned																			
Rationale for Program	Small diameter copper and iron conductors do not coordinate with upstream fusing and relay settings required for advanced fault detection programs. Under certain fault conditions the small diameter conductor will fail before the protection scheme will operate. Replacing the conductor with a larger size will ensure proper protective coordination.																			
Prioritization Approach	As with all grid design and system hardening programs, PacifiCorp prioritizes the location of work to be completed and includes all elements of the plan at those locations instead of prioritizing specific programs or initiatives. Tier 3 and Tier 2 activities are given the highest priority and all program elements planned on a given line or circuit in that location are combined into a project. This ensures that risk is mitigated in the highest risk geographic locations first and facilitates efficiency in planning and execution.																			
Plan for audits/quality checks	Where applicable, PacifiCorp intends to use standard company policies and procedures to implement audits/quality checks of its grid design and system hardening wildfire mitigation programs. Examples of these policies and procedures include but are not limited to the development and use of detailed engineering standards, thorough peer/panel review																			

³⁹ 2019 efforts significantly focused on engineering and scoping efforts.

		<p>of engineering design prior to approval, rigorous and competitive procurement processes, and use of qualified personnel for construction.</p> <p>PacifiCorp recently formed a Wildfire Mitigation Delivery Project Management Office within the transmission and distribution operations department and assigned a Wildfire Mitigation Delivery Director to lead the effort. The Wildfire Mitigation Implementation PMO will be responsible for planning, tracking, completion, and quality assurance of PacifiCorp's grid design and system hardening programs. While this department remains in its early stages and is not yet fully formed, the office intends to explore and develop a quality assurance process throughout the life cycle of the programs, specifically focused on the construction phase of these programs. Potential solutions currently under consideration might include the use of qualified inspectors, standardized forms and evaluations, or random sampling and inspection by the Wildfire Mitigation Delivery Director. PacifiCorp anticipates that this aspect of the program will evolve quickly and intends to provide additional updates and detail in the company's first annual update in 2021.</p>
Planned demonstration of effectiveness over time		The demonstration of effectiveness over time of the replacement of Cu conductor is a reduction of mis-coordination events of the circuits in scope for replacement and the ability to implement advance protection and control schemes.
Planned Evolution	General	<p>While PacifiCorp maintains its commitment to deliver the company's wildfire mitigation programs and projects as proposed, it is critical to recognize that, as these projects and programs are subject to continuous evaluation in an effort to drive continuous improvement, specifics may need to change and adapt to moving market conditions, resource constraints, and lessons learned. PacifiCorp intends to keep a close eye on these potential changes, which the company will incorporate into future Off-Ramp filings.</p> <p>Additionally, as PacifiCorp continues to implement its multi-year WMP, the company will continue to evaluate how various grid design and system hardening programs may be improved by either changes to scope, technology, timing, or prioritization. As PacifiCorp is early in the implementation of its multi-year WMP, it is challenging to know specifically how and when the company's installation of replacement of Cu conductor program will evolve. However, given the small and simplistic scope of the program, it is unlikely that the program will evolve significantly prior to completion.</p>
	Before the upcoming wildfire season	No expected/planned evolution at this time.
	Before the next annual update	No expected/planned evolution at this time.

	Within the next 3 years	No expected/planned evolution at this time.
	Within the next 10 years	No expected/planned evolution at this time.

The following table summarizes all elements of PacifiCorp's grid design and system hardening wildfire mitigation programs. Applicable pilot programs, such as Infrared inspections or LiDAR inspections, were only assigned dollar values for known spend in known years through the duration of the pilot project scope. Future potential spend associated with expansion or evolution of the pilot projects, which will be defined in future updates as the results of the pilot projects are evaluated, is not yet known and, therefore, is represented with TBD in the table below. For each program, where requested, 2019 plan values were included as N/A. Additionally, the 2019 WMP did not include specific annual requirements and, therefore, PacifiCorp only provided the total proposed program units and costs. Including any 2019 plan values for WMP programs contemplated in the company's 2019 WMP would be confusing and not helpful in understanding progress or the company's overall programs as these values reflect the total multi-year program proposals.

Table 23: Grid design and system hardening

Initiative activity	Year	Line miles to be treated	Spend/treated line mile	Ignition probability drivers targeted	Risk reduction	risk-spend efficiency	Other risk drivers addressed	Existing/new	Existing: What proceeding has reviewed program	If new: Memorandum account	In/exceeding compliance with regulations	Cite associated rule	Comments
1. Capacitor maintenance and replacement program	2019 plan	At this time, PacifiCorp does not have a specific grid design and system hardening wildfire mitigation program focused on capacitor maintenance and replacement. Capacitor replacement and maintenance is included in the company's standard inspection, maintenance, and replacement protocols. Any enhanced inspections or accelerated correction timeframe/replacements are captured in Section 5.3.4.3, Improvement of inspections.											
	2019 actual												
	2020												
	2021												
	2022												
	2020-2022 plan total												
2. Circuit breaker maintenance and installation to de-energize lines upon detecting a fault	2019 plan	At this time, PacifiCorp does not have a specific grid design and system hardening wildfire mitigation program focused on circuit breaker maintenance and replacement. Circuit breakers are generally installed for all distribution circuits and transmission lines to detect fault current and protect equipment in the event that a fault is detected. Circuit breaker replacement and maintenance is included in the company's standard inspection, maintenance, and replacement protocols. Any enhanced inspections or accelerated correction timeframe/replacements are captured in Section 5.3.4.3, Improvement of inspections. Replacement of specific, targeted circuit breakers as a part of PacifiCorp's WMP to support overall advanced coordination and detection efforts are better captured in initiative 5.3.3.9, Installation of system automation equipment.											
	2019 actual												
	2020												
	2021												
	2022												
	2020-2022 plan total												

Initiative activity	year	Line miles to be treated	Spend/treated line mile	Ignition probability drivers targeted	Risk reduction	risk-spend efficiency	Other risk drivers addressed	Existing/new	Existing: What proceeding has reviewed program	If new: Memorandum account	In/exceeding compliance with regulations	Cite associated rule	Comments
3. Covered conductor installation - transmission	2019 plan	N/A	N/A	Contact from object; Wire-to-wire contact / contamination	N/A	N/A	N/A	New Proposed in 2019	N/A	2019 WMP Memorandum Account	N/A (exceeds standard design)	N/A	Program can include multiple design types based on installation voltage/ type
	2019 actual	0	\$0										
	2020	0	\$0										
	2021	8	\$725,000										
	2022	8	\$725,000										
	2020-2022 plan total	16	\$725,000										
3b. Covered conductor installation - distribution	2019 plan	N/A	N/A	Contact from object; Wire-to-wire contact / contamination	N/A	N/A	N/A	New Proposed in 2019	N/A	2019 WMP Memorandum Account	N/A (exceeds standard design)	N/A	Program can include multiple design types based on installation voltage/ type
	2019 actual	0	\$0										
	2020	38	\$207,237										
	2021	52	\$218,904										
	2022	41	\$282,439										
	2020-2022 plan total	131	\$235,405										
4. Covered conductor maintenance	2019 plan	At this time, PacifiCorp does not have any grid design and system hardening programs focused on covered conductor maintenance. As PacifiCorp progresses with implementation of the company wildfire mitigation programs, the company will continue to evaluate covered conductor specific wildfire mitigation maintenance programs.											
	2019 actual												
	2020												
	2021												
	2022												
	2020-2022 plan total												
5. Crossarm maintenance, repair, and replacement	2019 plan	At this time, PacifiCorp does not have a specific grid design and system hardening wildfire mitigation program focused on crossarm maintenance, repair, and replacement.											
	2019 actual												
	2020												
	2021	Routine crossarm maintenance, repair, and replacement are included in the company’s standard inspection and correction programs, with an accelerated timeline for correction under the company’s Inspection program improvement, Section 5.3.4.3.											
	2022												
	2020-2022 plan total												

Initiative activity	year	Line miles to be treated	Spend/treated line mile	Ignition probability drivers targeted	Risk reduction	risk-spend efficiency	Other risk drivers addressed	Existing/new	Existing: What proceeding has reviewed program	If new: Memorandum account	In/exceeding compliance with regulations	Cite associated rule	Comments
6. Distribution pole replacement and reinforcement, including with composite poles	2019 plan	N/A	N/A	Contact from object; All types of equipment / facility failure	N/A	N/A	Facilitates restoration efforts through enhanced resiliency	New Element Proposed in 2019	CA GO 95 & 165 2018 GRC	2019 WMP Memorandum Account	Exceeds Regulation	CA GO 95 & 165	Exceeds regulation to the extent that poles are identified for replacement above and beyond standard inspection programs
	2019 actual	0	\$0										
	2020	39	\$8,436										
	2021	300	\$8,427										
	2022	300	\$8,427										
	2020-2022 plan total	639	\$8,427										
6b. Transmission pole replacement and reinforcement, including with composite poles	2019 plan	N/A	N/A	Contact from object; All types of equipment / facility failure	N/A	N/A	Facilitates restoration efforts through enhanced resiliency	New Element Proposed in 2019	CA GO 95 & 165 2018 GRC	2019 WMP Memorandum Account	Exceeds Regulation	CA GO 95 & 165	Exceeds regulation to the extent that poles are identified for replacement above and beyond standard inspection programs
	2019 actual	0	\$0										
	2020	150	\$24,480										
	2021	180	\$24,478										
	2022	180	\$24,478										
	2020-2022 plan total	510	\$24,478										
7.Expulsion fuse replacement	2019 plan	PacifiCorp is incorporating this element into other system hardening programs to embrace maximum planning and spend efficiency (pole replacement, covered conductor replacement, advanced coordination, etc. PacifiCorp will continue to evaluate the need for an additional overhead expulsion fuse program should all fuses not be replaced through other programs)											
	2019 actual												
	2020												
	2021												
	2022												
	2020-2022 plan total												
8. Grid topology improvements to mitigate or reduce PSPS events	2019 plan	N/A	N/A	N/A - Not an ignition probability risk reduction program	N/A	N/A	Reduced impact of PSPS events	New Proposed in 2019	N/A	2019 WMP Memorandum Account	Exceeds standard engineering design	N/A	In evaluation phase; No specific program dollars assigned. See Section 5.3.3.8
	2019 actual												
	2020												
	2021												
	2022												
	2020-2022 plan total												

Initiative activity	year	Line miles to be treated	Spend/treated line mile	Ignition probability drivers targeted	Risk reduction	risk-spend efficiency	Other risk drivers addressed	Existing/new	Existing: What proceeding has reviewed program	If new: Memorandum account	In/exceeding compliance with regulations	Cite associated rule	Comments
9. Installation of system automation equipment	2019 plan	N/A	N/A	All - Regardless of the cause, this program reduces that potential that a fault scenario results in an ignition event through advanced coordination	N/A	N/A	N/A	New Proposed in 2019	N/A	2019 WMP Memorandum Account	N/A (exceeds standard design)	N/A	As these projects are not scoped on a line-mile basis, the values reported reflect projects
	2019 actual	10	\$271,445										
	2020	31	\$97,710										
	2021	24	\$76,375										
	2022	3	\$166,667										
	2020-2022 plan total	58	\$92,449										
10. Maintenance, repair, and replacement of connectors, including hotline clamps	2019 plan	PacifiCorp does not currently have a specific grid design and system hardening wildfire mitigation program focused on maintenance, repair, and replacement of connectors, including hotline clamps. Replacement of connectors, where applicable, is included in other programs such as installation of covered conductor.											
	2019 actual												
	2020												
	2021												
	2022												
	2020-2022 plan total												
11. Mitigation of impact on customers and other residents affected during PSPS events	2019 plan	PacifiCorp does not currently have an additional grid design and system hardening wildfire mitigation program focused on mitigation of impact on customers and other residents affected during PSPS event outside of the initiatives described in Section 5.3.3.8.											
	2019 actual												
	2020												
	2021	Both of these programs are combined as relevant grid topology improvements pertaining to grid design and system hardening that reduce PSPS events inherently also mitigate the impact on customers. Furthermore, PacifiCorp’s additional programs or efforts to mitigate the impact on customers and other residents affected during a PSPS event are described in Section 4.4 and Section 5.6.2.											
	2022												
	2020-2022 plan total												
12. Other corrective action	2019 plan	At this time, PacifiCorp does not have any grid design and system hardening wildfire mitigation programs focused on other corrective action. PacifiCorp’s relevant corrective actions are included in the company’s Improvement of inspections in Section 5.3.4.3.											
	2019 actual												
	2020												
	2021												
	2022												
	2020-2022 plan total												

Initiative activity	Year	Line miles to be treated	Spend/treated line mile	Ignition probability drivers targeted	Risk reduction	risk-spend efficiency	Other risk drivers addressed	Existing/new	Existing: What proceeding has reviewed program	Memorandum account if new:	In/exceeding compliance with regulations	Cite associated rule	Comments
13. Pole loading infrastructure hardening and replacement program based on pole loading assessment program	2019 plan	<p>Pole loading to accommodate safety factors and necessary specifications are included in PacifiCorp's engineering and construction standards.</p> <p>At this time, PacifiCorp has piloted the use of LiDAR to create structural models to calculate pole loading capacity. In addition, specific pole loading assessment of in-service assets was included as a subset to the methodology of PacifiCorp's pole replacement programs included in Section 5.3.3.6. Where appropriate, pole loading assessment of new construction has also been incorporated into the new standards developed included in Section 5.3.3.6.</p>											
	2019 actual												
	2020												
	2021												
	2022												
	2020-2022 plan total												
14. Transformers maintenance and replacement	2019 plan	<p>At this time, PacifiCorp does not have a specific grid design and system hardening wildfire mitigation program focused on transformer maintenance and replacement. Transformer replacement and maintenance is included in the company's standard inspection, maintenance, and replacement protocols. Any enhanced inspections or accelerated correction timeframe/replacements are captured in Section 5.3.4.3, Improvement of inspections.</p>											
	2019 actual												
	2020												
	2021												
	2022												
	2020-2022 plan total												
15. Transmission tower maintenance and replacement	2019 plan	<p>PacifiCorp does not have a specific grid design and system hardening wildfire mitigation program focused on transmission tower maintenance and replacement outside of standard inspection and correction programs describes in Section 5.3.4 or transmission pole replacement as included in Section 5.3.3.6.</p>											
	2019 actual												
	2020												
	2021												
	2022												
	2020-2022 plan total												
16. Undergrounding of electric lines and/or equipment	2019 plan	<p>PacifiCorp recognizes that value may exist in installation of underground electrical equipment. However, at this time, PacifiCorp does not have any grid design and system hardening wildfire mitigation programs specifically focused on undergrounding of electric lines and/or equipment.</p>											
	2019 actual												
	2020												
	2021												
	2022												
	2020-2022 plan total												

Initiative activity	Year	Line miles to be treated	Spend/treated line mile	Ignition probability drivers targeted	Risk reduction	risk-spend efficiency	Other risk drivers addressed	Existing/new	Existing: What proceeding has reviewed program	Memorandum account If new:	In/exceeding compliance with regulations	Cite associated rule	Comments
17. Updates to grid topology to minimize risk of ignition in HFTDs	2019 plan	At this time, PacifiCorp does not have any specific grid design and system hardening wildfire mitigation programs focus on updates to grid topology to minimize risk of ignition in HFTDs. PacifiCorp recognizes that, as weather patterns change and overall modeling and assessments evolve, updates to grid topology is something to continue to evaluate.											
	2019 actual												
	2020												
	2021	Other grid design and system hardening programs include, as a component, grid topology improvements to minimize the risk of ignition in the HFTD. Similar to the company's grid topology improvement to mitigate or reduce PSPS events described in Section 5.3.3.8, PacifiCorp recognizes that it is challenging to mitigate wildfire risk through grid topology changes alone. Therefore, PacifiCorp focuses more on augmentation of existing circuitry through system hardening efforts included throughout Section 5.3.3.											
	2022												
	2020-2022 plan total												
18. Other - Replace small size Cu conductor	2019 plan	N/A	N/A	All - Regardless of the cause, this program reduces that potential that a fault scenario results in an ignition event through advanced coordination	N/A	N/A	N/A	New Proposed in 2019	N/A	2019 WMP Memorandum Account	N/A (exceeds standard design)	N/A	Program facilitates enhanced coordination which reduces impact of all types of fault events and reduced potential of ignition
	2019 actual	0	\$0										
	2020	3	\$166,000										
	2021	26	\$51,923										
	2022	13	\$75,000										
	2020-2022 plan total	42	\$67,214										

5.3.4 *Asset management and inspections*

PacifiCorp interprets asset management and inspections wildfire mitigation programs to include all proactive maintenance or inspections performed not already discussed in Section 5.3.3. Generally, these programs focus on inspection and correction of overhead energized electric lines, but also extend to intrusive pole testing, substation inspections, and pilot projects to deploy enhanced or alternate diagnostic technology. For each program requested, PacifiCorp focused on wildfire mitigation specific components or initiatives that required additional funding, development, or tracking. Where an existing program was deemed sufficient or where PacifiCorp did not have a wildfire mitigation specific program, notes were included.

Utilities protocols relating to maintenance or any electric lines that could directly, or indirectly relate to wildfire ignition

Inspection and correction programs are the cornerstone of a resilient system. These programs are tailored to identify conditions that could result in premature failure or potential fault scenarios, including situations in which the infrastructure may no longer be able to operate per code or engineered design, or may become susceptible to external factors, such as weather conditions.

PacifiCorp performs inspections on a routine basis as dictated by both state specific regulatory requirements and company-specific policies. When an inspection is performed on a PacifiCorp asset, inspectors use a predetermined list of condition codes (defined below) and priority levels (defined below) to describe any noteworthy observations or potential non-compliance discovered during the inspection. Once recorded, the company uses condition codes to establish the scope of and timeline for corrective action to make sure that the asset is in conformance with National Electric Safety Code (NESC®) requirements, state-specific code requirements such as California General Orders, and/or company specific policies. This process is designed to correct conditions while reducing impact to normal operations.

Key terms associated with PacifiCorp's Inspections & Corrections Program are defined as follows:

- **Detailed Inspection** – a careful visual inspections accomplished by visiting each structure, as well as inspecting spans between structures, which is intended to identify potential nonconformance with the NESC or other applicable state requirements such as California General Orders, nonconformance with PacifiCorp construction standards, infringement by other utilities or individuals, defects, potential safety hazards, and deterioration of the facilities which need to be corrected in order to maintain reliable and safe service.
- **Pole Test & Treat** – an inspection of wood poles to identify decay, wear, or woodpecker damage, which may include pole-sounding, inspection hole drilling, and excavation tests to assess the pole condition and identify the need for any treatment, repair, or replacement.
- **Patrol / Visual Assurance Inspection**– a brief visual inspection performed by viewing each facility from a vantage point allowing reasonable viewing access, which is intended to identify damage or defects to the transmission and distribution system, or other potential hazards or

right-of-way-encroachments that may endanger the public or adversely affect the integrity of the electric system, including items that could potentially cause a spark.

- **Enhanced Visual Inspection** – Visual Assurance Inspection paired with additional data collection such as infrared, ultraviolet, or LiDAR technology to further evaluate and categorize the current status of electric utility assets and inform the need for a prioritization of corrective actions.
- **Condition** – The state of something with regard to appearance, quality, or working order which can sometimes be used to identify potential impact to normal system operation or clearance, which is typically identified by an inspection.
- **Condition Codes** – Predetermined list of codes for use by inspectors to efficiently capture, categorize, and communicate observations and inform the scope of and timeline for potential corrective action.
- **Correction** – Scope of work required to remove a Condition within a specified timeframe.
- **Priority Level** – the level of risk assigned to the condition observed, as follows:
 - Priority A – Risk of high potential impact to safety or reliability which includes, as a subset, imminent threats equivalent to Level 1 conditions;
 - Priority B – Any other risk of at least moderate potential impact to safety or reliability, equivalent to Level 2 conditions;
 - Priority C – Any other risk of at least low potential impact to safety or reliability, equivalent to Level 3 conditions;

PacifiCorp’s asset inspection program involves three primary types of inspections: (1) Visual Assurance Inspection; (2) Detailed Inspection, and (3) Pole Test & Treat. Inspection cycles, which dictate the frequency of inspections, are set by PacifiCorp asset management and reflect both industry best practices and state specific requirements. In general, Visual Assurance Inspections are conducted more frequently, to quickly identify any obvious damage or defects which could affect safety or reliability, and Detailed Inspections are performed less frequently as detailed inspections are more thorough or intrusive. The frequency of Pole Test & Treat is typically dictated based on state specific requirements and, where applicable, is conducted in conjunction with certain Detailed Inspections.

Regardless of the type of inspection, the inspector conducting the inspection will notate any Conditions and assign a Condition Code and Priority Level in PacifiCorp’s Facility Point Inspection (FPI) system. Corrections are then scheduled and completed within the correction timeframes established by PacifiCorp asset management, which typically reflect industry best practices or state specific requirements. In all cases, the timeline

for Corrections takes into account the Priority Level of any identified Condition. Not surprisingly, a Priority A Condition is addressed on a much shorter timeframe than a Priority B Condition.

Wildfire Mitigation Inspection and Correction Program Enhancements

While PacifiCorp’s traditional inspection and correction programs maintain regulatory compliance and manage routine operational risk; they also mitigate wildfire risk by identifying and correcting Conditions which, if uncorrected, could ignite a fire. Nonetheless, recognizing the growing risk of wildfire and recent changes to California General Orders, PacifiCorp designed and incorporated additional elements to supplement the company’s standard inspection and correction programs mitigate the growing wildfire specific operational risks and create greater resiliency against wildfires beginning in 2018 with full implementation in 2019. There are four primary elements to these improvements: (1) creating a fire risk Condition Code; (2) increasing inspection frequencies in Fire High Consequence Areas; (3) narrowing Correction timeframes for Fire Risk Conditions; and (4) piloting new technologies to facilitate Enhanced Visual Inspections.

1. Fire Risk Conditions

PacifiCorp currently designates certain Conditions as “Fire Risk Conditions.” Each Condition is still assigned a Condition Code (i.e. CONDFRAY for a damaged or frayed primary conductor) – but certain Condition Codes are categorically designated as a Fire Risk Condition. Accordingly, if a Condition is designated under a particular Condition Code associated as a fire risk, the Condition will also be designated as a Fire Risk Condition. To this end, a review was performed on all existing Condition Codes to determine whether the Condition Code could have any correlation with fire ignition. Condition Codes reflecting an appreciable risk of fire ignition were designated as Fire Risk Conditions. For example, if a damaged or frayed primary conductor was observed during an inspection, the inspector would record condition code CONDFRAY, which is designated as a Fire Risk Condition because the Condition could eventually result in an ignition under certain circumstances. In contrast, the observation of a missing or broken guy marker would result in the condition code GUYMARK, which is not designated as a Fire Risk Condition.

2. Inspection Frequency

Consistent with California General Order 165 and California General Order 95, PacifiCorp increased the frequency of all three inspections types for assets located in Tier 2 and Tier 3 of the HFTD. Consistent with industry best practices, inspections are PacifiCorp’s preferred mechanism to identify Conditions, including those considered to be Fire Risk Conditions. Therefore, an increase in the frequency of inspections should result in more timely identification of potential Fire Risk Conditions. Relevant wildfire mitigation inspection frequencies are included in the table below.

Asset Classification	Inspection Name	Minimum Frequency
Main Grid Transmission	Safety/Visual Assurance	Every year
	Detailed Inspection	Every 2 years

Asset Classification	Inspection Name	Minimum Frequency
	Detailed / Pole Test and Treat	Every 10 years
OH Local Transmission	Safety/Visual Assurance	Every year
	Detailed Inspection	Every 5 years
	Detailed / Pole Test and Treat	Every 10 years
OH Distribution	Safety/Visual Assurance	Tier 2 & 3 - Every year Non-Tier - Every 2 years
	Detailed Inspection	Every 5 years
	Detailed / Pole Test and Treat	Every 20 years

3. Correction Timeframe

Reducing the time allowed for Correction of Fire Risk Conditions, as identified through regular inspections, will result in reduced exposure to the wildfire risk. PacifiCorp uses a state specific approach to determine an appropriate scope and timeframe for Corrections of Conditions, including Fire Risk Conditions. These timeframes reflect a balance between local operation risk from wildfire threats and prudent utility practice. Fire Risk Conditions identified within Tier 2 and Tier 3 within the HFTD are assigned a higher risk level than those outside of the HFTD, and, therefore, are corrected within a shorter timeframe to reduce operation risk. Wildfire mitigation related correction timeframes are consistent with CA GO 95 Rule 18A and are included in the table below:

Priority	Location	Correction Timeframe
A - imminent	Any	Immediately
A	Any	30 days
B	Tier 3	6 months
	Tier 2	12 months
	Other	36 months
C	Any ⁴⁰	5 years

⁴⁰ PacifiCorp defines a Fire Risk Condition as having at least moderate potential impact to safety or reliability and, as a result, only assigns a condition code priority of A or B to this subset of Conditions. Therefore, accelerated correction timeframes for Fire Risk Conditions which include specific rules based on geographic wildfire risk location cannot apply to C conditions.

4. Piloting New Technologies to Facilitate Enhanced Inspections

As previously defined, Enhanced Inspections are a visual assurance or patrol inspection paired with additional data collection such as infrared or ultraviolet to further evaluate and categorize the current status of electric utility assets and inform the need for a prioritization of corrective actions. This is an extension consistent with the definition included in the Glossary of Terms.

The use of infrared (IR), ultraviolet (UV), and Light Detection and Ranging (LiDAR) technology can identify potential hot spots, partial discharge, or compromised clearance of energized equipment respectively, which can be indicative of loose connections or encroachment threat, potential future failure, and potential elevated wildfire risk. Therefore, PacifiCorp's improvements to inspection and correction programs included piloting new technology to diagnose additional potential threats. PacifiCorp initiated these pilot programs in 2019 which are further discussed in Section 5.3.4.4, Section 5.3.4.5, Section 5.3.4.7, and Section 5.3.4.8.

5.3.4.1 Detailed inspections of distribution electric lines and equipment

Program Name	Asset management and inspections
Initiative Name	Detailed inspections of distribution electric lines and equipment
Description	<p>PacifiCorp's detailed inspection program includes a careful visual inspections accomplished by visiting each structure, as well as inspecting spans between structures, which is intended to identify potential nonconformance with the NESC or other applicable state requirements such as California General Orders, nonconformance with PacifiCorp construction standards, infringement by other utilities or individuals, defects, potential safety hazards, and deterioration of the facilities which need to be corrected in order to maintain reliable and safe service.</p> <p>Detailed inspections are performed consistent with General Order 165 and California General Order 95 requirements regarding frequency and correction timeframe.</p>
Timeline to Minimize Risk [Planned/ Implemented]	Implemented (Existing Program)
Rationale for Program	Compliance with California General Order 165 & General Order 95
Prioritization Approach	No specific prioritization within the program outside of adherence to California General Order 165 & General Order 95 that requires inspection frequency cycle reduction and condition correction acceleration for Tier 2 and Tier 3 locations.
Plan for audits/quality checks	See Section 5.3.4.14
Planned demonstration of effectiveness over time	Demonstrated effectiveness includes the identification of Conditions and reduction in ignition probability drivers such as fault events associated with equipment failure or mis-operation.

Planned Evolution	General	As with all of PacifiCorp's inspection programs, the company intends to implement these programs, pilot new technologies or methods where appropriate, and translate lessons learned or effectiveness into long term program modification and evolution. Currently, PacifiCorp's detailed inspection program already incorporates reduced frequency of inspection and accelerated timeframe for correction per D.18-05-042.
	Before the upcoming wildfire season	No expected/planned evolution at this time.
	Before the next annual update	No expected/planned evolution at this time.
	Within the next 3 years	As PacifiCorp continues to implement its multi-year WMP, the company will continue to evaluate how inspections may be improved by either changes to scope, tools, frequency, or correction timeframe. Pending the results of the enhanced inspection pilot projects (included in Section 5.3.4.4, Section 5.3.4.5, Section 5.3.4.5, Section 5.3.4.7, and Section 5.3.4.8), PacifiCorp anticipates that either additional scope may be added to the entirety of its inspection programs or specifically to the company's detailed inspection of distribution lines. As the pilot projects are in early stages of development and implementation, it is challenging to know specifically how and when the results of these programs may impact PacifiCorp's detailed inspection program evolution but the company anticipated that it would be within the next three years.
	Within the next 10 years	Continued evolution based on use of new technology for advanced detection.

5.3.4.2 Detailed inspections of transmission electric lines and equipment

Program Name	Asset management and inspections
Initiative Name	Detailed inspections of transmission electric lines and equipment
Description	<p>PacifiCorp's detailed inspection program includes a careful visual inspections accomplished by visiting each structure, as well as inspecting spans between structures, which is intended to identify potential nonconformance with the NESC or other applicable state requirements such as California General Orders, nonconformance with PacifiCorp construction standards, infringement by other utilities or individuals, defects, potential safety hazards, and deterioration of the facilities which need to be corrected in order to maintain reliable and safe service.</p> <p>Detailed inspections are performed consistent with General Order 165 and California General Order 95 requirements regarding frequency and correction timeframe.</p>
Timeline to Minimize Risk [Planned/ Implemented]	Implemented
Rationale for Program	Compliance with General Order 165
Prioritization Approach	No specific prioritization within the program outside of adherence to California General Order 165 & General Order 95 that requires inspection frequency reduction and condition correction acceleration for Tier 2 and Tier 3 locations
Plan for audits/quality checks	See Section 5.3.4.14
Planned demonstration of effectiveness over time	Demonstrated effectiveness includes the identification of Conditions and reduction in ignition probability drivers such as fault events associated with equipment failure or mis-operation.

Planned Evolution	General	As with all of PacifiCorp's inspection programs, the company intends to implement these programs, pilot new technologies or methods where appropriate, and translate lessons learned or effectiveness into long term program modification and evolution. Currently, PacifiCorp's detailed inspection program already incorporates reduced frequency of inspection and accelerated timeframe for correction per D.18-05-042.
	Before the upcoming wildfire season	No expected/planned evolution at this time.
	Before the next annual update	No expected/planned evolution at this time.
	Within the next 3 years	As PacifiCorp continues to implement its multi-year WMP, the company will evaluate how inspections may be improved by either changes to scope, tools, frequency, or correction timeframe. Pending the results of the enhanced inspection pilot projects (included in Section 5.3.4.4, Section 5.3.4.5, Section 5.3.4.5, Section 5.3.4.7, and Section 5.3.4.8), PacifiCorp anticipates that either additional scope may be added to the entirety of its inspection programs or specifically to the company's detailed inspection of transmission lines. As the pilot projects are in early stages of development and implementation, it is challenging to know specifically how and when the results of these programs may impact PacifiCorp's detailed inspection program evolution but the company anticipated that it would be within the next three years.
	Within the next 10 years	Continued evolution based on use of new technology for advanced detection.

5.3.4.3 Improvement of inspections

Program Name	Asset management and inspections
Initiative Name	Improvement of inspections
Description	<p>While PacifiCorp's traditional inspection and correction programs are effective at maintaining regulatory compliance and managing routine operational risk. They also mitigate wildfire risk by identifying and correcting Conditions which, if uncorrected, could ignite a fire. Nonetheless, recognizing the growing risk of wildfire, PacifiCorp designed and incorporated additional elements to supplement the company's standard inspection and correction programs mitigate the growing wildfire specific operational risks and create greater resiliency against wildfires beginning in 2018 with full implementation in 2019. There are four primary elements to this proposal: (1) creating a fire risk Condition Code; (2) increasing inspection frequencies in Fire High Consequence Areas; (3) narrowing Correction timeframes for Fire Risk Conditions; and (4) piloting new technologies to facilitate Enhanced Visual Inspections.</p> <p>General discussion of these elements is included on page 175 under the Wildfire Mitigation Inspection and Correction Program Enhancements subsection.</p> <p>PacifiCorp's asset management and inspections wildfire mitigation program focused on improvement of inspections generally includes items (1) through (3). Other details regarding piloting of new technologies are included in Sections 5.3.4.4, Section 5.3.4.5, Section 5.3.4.7, and Section 5.3.4.8.</p>
Timeline to Minimize Risk [Planned/ Implemented]	Implemented
Rationale for Program	California General Order 165 and California General Order 95
Prioritization Approach	No specific prioritization within the program outside of adherence to California General Order 165 & General Order 95 that requires inspection frequency reduction and condition correction acceleration for Tier 2 and Tier 3 locations

Plan for audits/quality checks		See Section 5.3.4.14
Planned demonstration of effectiveness over time		Demonstrated effectiveness includes the identification of Conditions and reduction in ignition probability drivers such as fault events associated with equipment failure or mis-operation. While new technologies are discussed in Section 5.3.4.4, Section 5.3.4.5, Section 5.3.4.7, and Section 5.3.4.8, effectiveness of improved inspections as they pertain to the use of new technology include the identification of Conditions not traditionally identified through visual inspection programs.
Planned Evolution	General	As with all of PacifiCorp's inspection programs, the company intends to implement these programs, pilot new technologies or methods where appropriate, and translate lessons learned or effectiveness into long term program modification and evolution. This same approach applies to the improvement of inspection.
	Before the upcoming wildfire season	No expected/planned evolution at this time.
	Before the next annual update	No expected/planned evolution at this time.
	Within the next 3 years	As PacifiCorp continues to implement its multi-year WMP, the company will evaluate how inspections may be improved by either changes to scope, tools, frequency, or correction timeframe. Pending the results of the enhanced inspection pilot projects, PacifiCorp anticipates that either additional scope may be added to the entirety of its inspection program or to specific elements. As the pilot projects are in early stages of development and implementation, it is challenging to know specifically how and when the results of these programs may impact PacifiCorp's inspection program evolution but the company anticipated that it would be within the next three years
	Within the next 10 years	Continued evolution based on use of new technology for advanced detection.

5.3.4.4 Infrared inspections of distribution electric lines and equipment

Program Name	Asset management and inspections
Initiative Name	Infrared inspections of distribution electric lines and equipment
Description	<p>At this time, PacifiCorp does not have a specific asset management and inspections wildfire mitigation program focused on the infrared inspections of distribution electric lines and equipment. As a part of the company's 2019 wildfire mitigation efforts, the use of infrared technology was applied to transmission lines which is further discussed in Section 5.3.4.5. Depending on the results of this pilot project, PacifiCorp may pursue an extension of this pilot project to include distribution lines. However, the collection methodology and quality of inspection difficulties will need to be evaluated as PacifiCorp's distribution lines tend to be located in areas with a tree canopy, making efficient collection of valuable IR data challenging.</p>

5.3.4.5 Infrared inspections of transmission electric lines and equipment

Program Name	Asset management and inspections
Initiative Name	Infrared inspections of transmission electric lines and equipment
Description	<p>As included in the company's 2019 California WMP, PacifiCorp proposed implementing new enhanced transmission line inspections with a focus on proactive identification of equipment failure. When developed, and included in the 2019 WMP, these inspections were thought to be an annual inspection performed via either helicopter or UAS technology. PacifiCorp also noted in the Company's 2019 WMP that the frequency of proposed programs/inspections reflected PacifiCorp's reasonable best estimate based on available knowledge and prudent utility practices and that PacifiCorp anticipated using data collected during these new inspections to further inform required frequency and anticipates changing the frequency at a future date to better reflect a risk-based approach. Therefore, PacifiCorp implemented a pilot project in 2019 to further evaluate and inform an infrared inspection program.</p> <p>To accomplish this, PacifiCorp performed enhanced inspections on company owned overhead transmission lines in California using alternative technologies to identify hot spots, potential substandard connections or significant insulative degradation not typically detectable through visual inspection. Helicopter services were utilized to collect Infrared (IR) and Ultraviolet (UV or Corona) data for all connections and energized equipment. The data was analyzed and a corrective action timeline was assigned based on the severity level for each detected abnormality. To supplement the data collection in California and provide a wider range of results, PacifiCorp also inspected a subset of its Oregon service territory, adding approximately 422 line miles, or 50%, to any statistical analysis to provide a broader data set for evaluation.</p> <p>As IR inspections measure heat and look for anomalies, the effectiveness of IR inspections can depend on the loading on the particular line or piece of equipment being inspected. Therefore two rounds of inspections were performed, under normal loading conditions and under peak loading conditions. To accomplish this, data capture was performed first on all lines in June of 2019 during normal loading conditions. Subsequently, the transmission lines were then categorized into either Summer peaking or Winter peaking and scheduled for an appropriate second set of inspections which was either completed in July of 2019 or January of 2020.</p> <p>All Conditions detected during these inspections have either been corrected or are scheduled for correction depending on severity of the condition detected and when outages of the transmission lines could be scheduled.</p>

Results

No actionable conditions were found with the collected UV data. One (1) abnormal heating Conditions was detected using IR data with a severity rating of medium, reflecting a frequency of 1 finding per 1,474 line-miles inspected total, or \$236,900 per condition detected effective cost. Based on the CA scope alone, the frequency of findings was 1 per 1,474 line miles inspected or \$236,900 per Condition.

The following table includes the scope of work completed during the IR and UV pilot project in California. The winter peak loading flights were scheduled and completed at the time this document was prepared but only preliminary results were available.

Targeted Inspection	Inspection Description	Inspection Window	Days	Line-Miles	Cost	# of Findings	\$/findings	Finding/Line Mile
Pre-Fire Season	UV and IR inspections are completed in targeted high-risk areas in California before fire risk elevates further during fire season	June 11-18, 2019	8 days	737	\$98,800	0	N/A – No findings	N/A – No findings
Summer Peak Loading	To detect abnormal system conditions that would not be evident during low loading periods, previously flown lines that peak in summer are re-inspected during this period	July 15-24, 2019	10 days	505	\$94,000	1	\$94,000/finding	1 finding per 505 line-miles
Winter Peak Loading ⁴¹	To detect abnormal system conditions that would not be evident during low loading periods, previously flown lines that peak in winter are to be re-inspected during this period	January 13-19, 2020	7 days	232	\$44,100	0	N/A – No findings	N/A – No findings
Total	All inspections combined		25 days	1,474	\$236,900	1	\$236,900/finding	1 finding per 1,474 line-miles

Preliminary Conclusions

⁴¹ Winter Peak Loading inspection summary includes preliminary results and planned values. At this time this document was completed, the formal report had not yet been compiled for incorporation into PacifiCorp's 2020 WMP.

	<p>Preliminary results indicate that IR technology may a reliable method to detect abnormal heating conditions and potentially identify Conditions not normally found during a visual inspection. While more expensive and challenging to coordinate on a line-miles basis, preliminary results also indicate IR inspections may be more valuable when performed on equipment or lines at peak loading conditions rather than at normal loading conditions based on the identification of more conditions during the pilot project when inspections were perfumed at peak loading conditions. However, elevated heating can still be detected at normal loading conditions.</p> <p>While UV inspections are also a proven method of finding abnormal and potentially hazardous conditions that are not detectable during visual inspections, preliminary results did not prove the combination of UV and IR inspections to be optimal because the best time to conduct IR inspections (peak load) does not correspond to the best time to conduct UV inspections (early morning / late evening). Because of this, PacifiCorp plans to remove the UV component of the IR inspection pilot project moving forward.</p>
Timeline to Minimize Risk [Planned/ Implemented]	Partial Implementation Further evaluation required
Rationale for Program	<p>The use of infrared (IR) and ultraviolet (UV) technology can identify potential hot spots and partial discharge on energized equipment, which can be indicative of loose connections and potential future failure and pose a wildfire risk. Therefore, PacifiCorp developed and implemented a pilot project to included Enhanced Visual Inspection on overhead transmission lines within the all of California to include the capture of IR and UV data.</p>
Prioritization Approach	<p>High priority given based on availability of contracted resources. This task generally does not compete with other programs for resources other than funding. No specific prioritization within the program itself due to the benefit of a large data set to support analysis of results and the financial benefit of packaging the total work together.</p>
Plan for audits/quality checks	See Section 5.3.4.14

Planned demonstration of effectiveness over time		Identification of Conditions not traditionally identified through visual inspections.
Planned Evolution	General	As with all of PacifiCorp's inspection programs, the company intends to implement these programs, pilot new technologies or methods where appropriate, and translate lessons learned or effectiveness into long term program modification and evolution. Currently, PacifiCorp's detailed inspection program incorporates reduced frequency of inspection and accelerated timeframe for correction per D.18-05-042.
	Before the upcoming wildfire season	PacifiCorp intends to complete the full scope of its pilot project as described above and analyze results.
	Before the next annual update	PacifiCorp plans to evaluate the full results from the company's initial pilot project, potentially remove the UV component of the IR inspection pilot project on any subsequent flights or inspection, and schedule implement any subsequent flights to support data collection, condition identification, and wildfire risk mitigation. PacifiCorp anticipates that the IR pilot project may inform or evolve into a more formal or routine program before the next annual update in 2021.
	Within the next 3 years	As PacifiCorp continues to implement its multi-year WMP, the company will evaluate how inspections may be improved by either changes to scope, tools, frequency, or correction timeframe. Pending the results of the enhanced inspection pilot projects, PacifiCorp anticipates that either additional scope may be added to the entirety of its inspection programs or specifically to the company's IR inspection of transmission lines. As the pilot projects are in early stages of development and implementation, it is challenging to know specifically how and when the results of these programs may impact PacifiCorp's detailed inspection program evolution but the company anticipated that it would be within the next three years.
	Within the next 10 years	Continued evolution based on use of new technology for advanced detection.

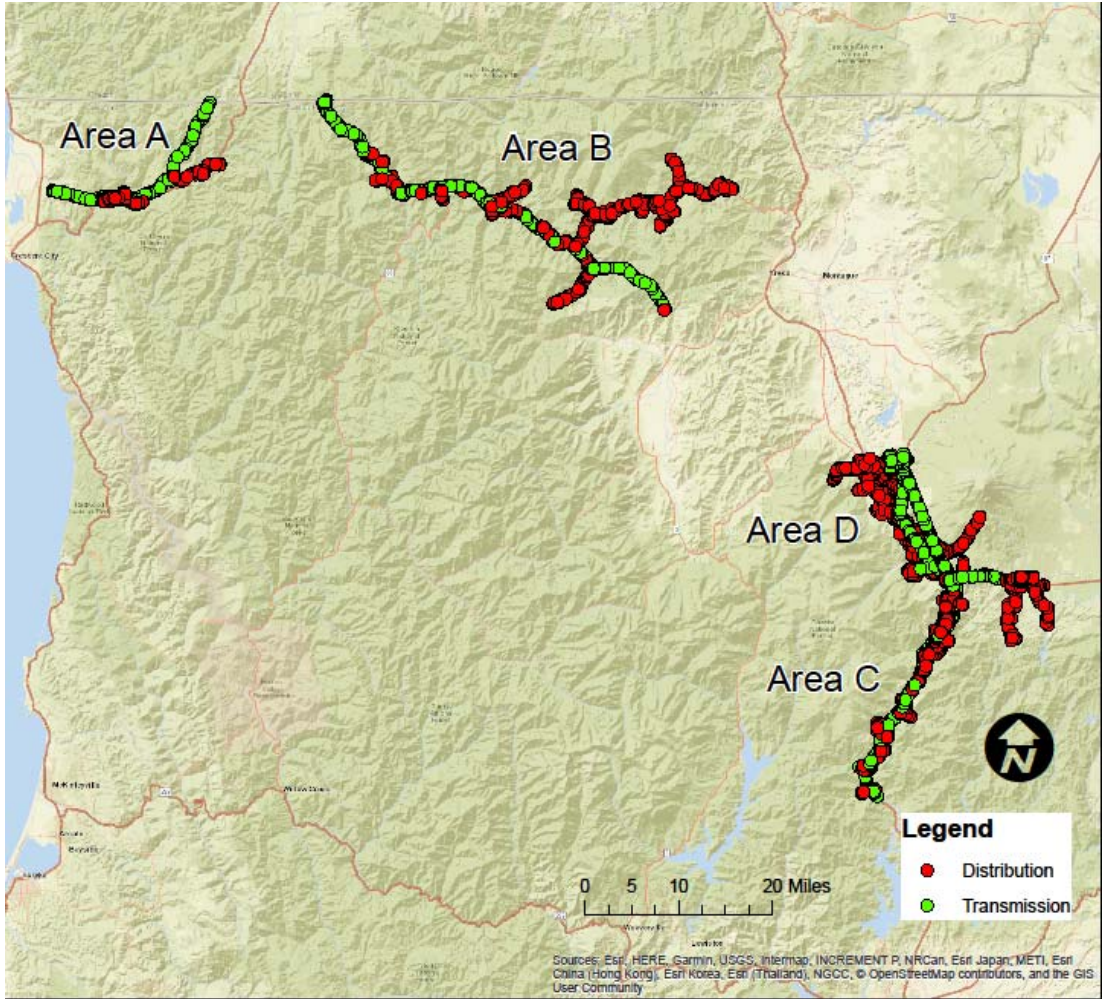
5.3.4.6 Intrusive pole inspections

Program Name	Asset management and inspections
Initiative Name	Intrusive pole inspections
Description	PacifiCorp's Pole Test and Treat program was described in Section 5.3.4 under the Utilities protocols relating to maintenance or any electric lines that could directly, or indirectly relate to wildfire ignition subsection. Components of this intrusive testing program can include excavation, pole sounding, pole boring, strength testing, and treatment depending on the material and specifications of in the installation. These tests are performed on a frequency consistent with CA state requirements and general utility best practices.
Timeline to Minimize Risk [Planned/ Implemented]	Implemented
Rationale for Program	Compliance with General Order 165
Prioritization Approach	Highly prioritized to meet CA General Order compliance requirements
Plan for audits/quality checks	See Section 5.3.4.14
Planned demonstration of effectiveness over time	Demonstrated effectiveness includes the identification of poles needing proactive replacement as identified through this testing that was not identified through visual inspection.

Planned Evolution	General	As with all of PacifiCorp's inspection programs, the company intends to implement these programs, pilot new technologies or methods where appropriate, and translate lessons learned or effectiveness into long term program modification and evolution. As PacifiCorp continues to implement its multi-year WMP, the company will continue to evaluate how inspections may be improved by either changes to scope, tools, frequency, or correction timeframe, including intrusive pole inspections. However, as PacifiCorp is early in its implementation of its's multi-year WMP, it is challenging to know specifically how and when the results of these programs may impact PacifiCorp's intrusive pole inspection program evolution.
	Before the upcoming wildfire season	No planned evolution at this time
	Before the next annual update	No planned evolution at this time
	Within the next 3 years	No planned evolution at this time
	Within the next 10 years	No planned evolution at this time

5.3.4.7 LiDAR inspections of distribution electric lines and equipment

Program Name	Asset management and inspections						
Initiative Name	LiDAR inspections of distribution electric lines and equipment						
Description	PacifiCorp performed LiDAR (Light Detection and Ranging) data collection, analysis, and system modeling on the PacifiCorp network in four select areas of Northern California consisting of 924 line-miles and 12,803 structures. Assets inspected include both transmission and distribution in rural and suburban environments. Contractor services were utilized for data collection via fixed wing aircraft, data processing, and system modeling. PacifiCorp intends to use system models to identify any imminent threats, assess current status and risk, map vegetation densities, and inform future vegetation clearing cycles. While the specific elements or results of this program have yet to be determined, PacifiCorp anticipates that this work to inform, identify, and quantify items such as current vegetation clearances, potential encroachments, asset status/condition, other hazards such as leaning poles or threat trees, dead/dying trees, and density per circuit/line. Utilizing these models to inform and respond to immediate vegetation hazards and further inform clearing cycles may aid in preventing faults, nuisance trips, and downed lines related to tree strikes, falling branches, and other vegetation encroachments. Refer to the below chart and map for details on the assets and geographic areas where this pilot program is being implemented:						
	Area of Interest	Description	Total OH Line-Miles	Distribution		Transmission	
				Line-Miles	Voltage(s)	Line-Miles	Voltage(s)
	A	NW CA Del Norte Substation to Oregon State Line	132	18	12.47 kV	114	115kV
	B	Klamath National Forrest Line 33 - Oregon State Line to Junction	174	104	4.16 kV, 12.47 kV	70	69kV
	C	North Central CA Line 2 - Shasta to South End	266	99	2.4kV, 4.16kV, 12.47kV, 20.8kV	167	69kV, 115kV
	D	Shasta to Weed	352	155	2.4kV, 4.16kV, 12.47kV, 20.8kV	197	69kV, 115kV
	TOTAL	A, B, C, D	924	376	2.4kV, 4.16kV, 12.47kV, 20.8kV	548	69kV, 115kV

	
<p>Timeline to Minimize Risk [Planned/ Implemented]</p>	<p>Partial implementation that requires further evaluation</p>

Rationale for Program		LiDAR data collection allows for highly accurate 3D modeling of assets and any objects within a range of those assets. This model can be used to calculate pole lean, identify potential compromised clearance or encroachments, evaluate threats and verify exact locations of assets. The identification of these hazards can help prevent fault scenarios and reduce ignition risk. However, full deployment and application remains unclear. Therefore, PacifiCorp developed and implemented a pilot project to scan and model a select subset of assets using LiDAR technology.
Prioritization Approach		<p>High priority given based on availability of contracted resources. This task generally does not compete with other programs for resources other than funding.</p> <p>However, prioritization was performed when determining the scope of the pilot project. As opposed to performing a LiDAR inspection and assessment of all of PacifiCorp' service territory, PacifiCorp prioritized 4 specific areas of interest to reflect the range of installations, environmental conditions, topography, topology and wildfire risks that might exist throughout the company's CA service territory.</p>
Plan for audits/quality checks		See Section 5.3.4.14
Planned demonstration of effectiveness over time		Effectiveness of the LiDAR inspections of transmission electric lines and equipment are recommended corrective or proactive work not typically identified through traditional visual inspections or processes included in Sections 5.3.4 and 5.3.5. Additional areas that may demonstrate effectiveness is overall condition assessment, risk assessment, and more informed planning of future pilot projects or enhanced inspections.
Planned Evolution	General	As with all of PacifiCorp's inspection programs, the company intends to implement these programs, pilot new technologies or methods where appropriate, and translate lessons learned or effectiveness into long term program modification and evolution.
	Before the upcoming wildfire season	PacifiCorp intends to complete the full scope of its pilot project as described above and analyze results.
	Before the next annual update	PacifiCorp plans to evaluate the full results from the company's initial pilot project and schedule implement any subsequent inspections to support data collection, condition identification, and wildfire risk mitigation. PacifiCorp

		anticipates that the LiDAR pilot project may either inform new programs and evolve into a more formal or routine program before the next annual update in 2021 depending on the results and effectiveness of the pilot.
	Within the next 3 years	As PacifiCorp continues to implement its multi-year WMP, the company will evaluate how inspections may be improved by either changes to scope, tools, frequency, or correction timeframe. Pending the results of the enhanced inspection pilot projects, PacifiCorp anticipates that either additional scope may be added to the entirety of its inspection programs or specifically to the company's LiDAR inspection of transmission lines. As the pilot projects are in early stages of development and implementation, it is challenging to know specifically how and when the results of these programs may impact PacifiCorp's detailed inspection or vegetation inspection program evolution but the company anticipated that it would be within the next three years.
	Within the next 10 years	Continued evolution based on use of new technology for advanced detection.

5.3.4.8 LiDAR inspections of transmission electric lines and equipment

Program Name	Asset management and inspections
Initiative Name	LiDAR inspections of transmission electric lines and equipment
Description	PacifiCorp's Transmission LiDAR inspection initiative summary is included in the previous section which describes the distribution and transmission LiDAR inspections of distribution electric lines and equipment. As the collection and analysis of this data was viewed as a system wide activity and model, a separate program was not designed or implemented. However, LiDAR inspections were performed on a subset of PacifiCorp's transmission lines in CA. See Section 5.3.4.7 for more details.
Timeline to Minimize Risk [Planned/ Implemented]	Implemented – Not yet complete (See Section 5.3.4.7)

5.3.4.9 Other discretionary inspection of distribution electric lines and equipment, beyond inspections mandated by rules and regulations

Program Name	Asset management and inspections
Initiative Name	Other discretionary inspection of distribution electric lines and equipment, beyond inspections mandated by rules and regulations
Description	At this time, PacifiCorp does not have any specific asset management and inspections wildfire mitigation programs focused on other discretionally inspection of distribution lines not included in other programs.

5.3.4.10 Other discretionary inspection of transmission electric lines and equipment, beyond inspections mandates by rules and regulations

Program Name	Asset management and inspections
Initiative Name	Other discretionary inspection of transmission electric lines and equipment, beyond inspections mandates by rules and regulations
Description	At this time, PacifiCorp does not have any specific asset management and inspections wildfire mitigation programs focused on other discretionally inspection of transmission lines not included in other programs.

5.3.4.11 Patrol inspections of distribution electric lines and equipment

Program Name	Asset management and inspections
Initiative Name	Patrol inspections of distribution electric lines and equipment
Description	<p>PacifiCorp's patrol inspection program includes a brief visual inspection performed by viewing each facility from a vantage point allowing reasonable viewing access, which is intended to identify damage or defects to the transmission and distribution system, or other potential hazards or right-of-way-encroachments that may endanger the public or adversely affect the integrity of the electric system, including items that could potentially cause a spark</p> <p>Patrol inspections are performed consistent with General Order 165 and California General Order 95 requirements regarding frequency and correction timeframe.</p>
Timeline to Minimize Risk [Planned/ Implemented]	Implemented
Rationale for Program	Compliance with California General Order 165 & General Order 95
Prioritization Approach	No specific prioritization within the program outside of adherence to California General Order 165 & General Order 95 that requires inspection frequency reduction and condition correction acceleration for Tier 2 and Tier 3 locations
Plan for audits/quality checks	See Section 5.3.4.14
Planned demonstration of effectiveness over time	Demonstrated effectiveness includes the identification of Conditions and reduction in ignition probability drivers such as fault events associated with equipment failure or mis-operation.

Planned Evolution	General	As with all of PacifiCorp's inspection programs, the company intends to implement these programs, pilot new technologies or methods where appropriate, and translate lessons learned or effectiveness into long term program modification and evolution. Currently, PacifiCorp's patrol inspection program already incorporates reduced frequency of inspection and accelerated timeframe for correction per D.18-05-042.
	Before the upcoming wildfire season	No planned evolution at this time
	Before the next annual update	No planned evolution at this time
	Within the next 3 years	Pending the results of the enhanced inspection pilot projects, PacifiCorp anticipates that either additional scope may be added to the entirety of its inspection program or specifically to the company's patrol inspection of distribution lines. As the pilot projects are in early stages of development and implementation, it is challenging to know specifically how and when the results of these programs may impact PacifiCorp's detailed inspection program evolution but the company anticipated that it would be within the next three years.
	Within the next 10 years	Continued evolution based on use of new technology for advanced detection.

5.3.4.12 Patrol inspections of transmission electric lines and equipment

Program Name	Asset management and inspections
Initiative Name	Patrol inspections of transmission electric lines and equipment
Description	<p>PacifiCorp's patrol inspection program includes a brief visual inspection performed by viewing each facility from a vantage point allowing reasonable viewing access, which is intended to identify damage or defects to the transmission and distribution system, or other potential hazards or right-of-way-encroachments that may endanger the public or adversely affect the integrity of the electric system, including items that could potentially cause a spark</p> <p>Patrol inspections are performed consistent with General Order 165 and California General Order 95 requirements regarding frequency and correction timeframe.</p>
Timeline to Minimize Risk [Planned/ Implemented]	Implemented
Rationale for Program	Compliance with California General Order 165 & General Order 95
Prioritization Approach	No specific prioritization within the program outside of adherence to California General Order 165 & General Order 95 that requires inspection frequency reduction and condition correction acceleration for Tier 2 and Tier 3 locations
Plan for audits/quality checks	See Section 5.3.4.14
Planned demonstration of effectiveness over time	Demonstrated effectiveness includes the identification of Conditions and reduction in ignition probability drivers such as fault events associated with equipment failure or mis-operation.

Planned Evolution	General	As with all of PacifiCorp's inspection programs, the company intends to implement these programs, pilot new technologies or methods where appropriate, and translate lessons learned or effectiveness into long term program modification and evolution. Currently, PacifiCorp's patrol inspection program already incorporates reduced frequency of inspection and accelerated timeframe for correction per D.18-05-042.
	Before the upcoming wildfire season	No planned evolution at this time
	Before the next annual update	No planned evolution at this time
	Within the next 3 years	Pending the results of the enhanced inspection pilot projects, PacifiCorp anticipates that either additional scope may be added to the entirety of its inspection program or specifically to the company's patrol inspections of transmission lines. As the pilot projects are in early stages of development and implementation, it is challenging to know specifically how and when the results of these programs may impact PacifiCorp's detailed inspection program evolution but the company anticipated that it would be within the next three years.
	Within the next 10 years	Continued evolution based on use of new technology for advanced detection.

5.3.4.13 Pole loading assessment program to determine safety factor

Program Name	Asset management and inspections
Initiative Name	Pole loading assessment program to determine safety factor
Description	<p>Pole loading to accommodate safety factors and necessary specifications are included in PacifiCorp's engineering and construction standards.</p> <p>At this time, PacifiCorp does not have a specific asset management and inspections wildfire mitigation program focused on pole loading assessment to determine safety factor of in-service assets. Specific pole loading assessment of in-service assets was included as a subset to the methodology of PacifiCorp's pole replacement programs included in Section 5.3.3.6. Where appropriate, pole loading assessment of new construction has also been incorporated into the new standards developed included in Section 5.3.3.6.</p>

5.3.4.14 Quality assurance/ quality control of inspections

Program Name	Asset management and inspections
Initiative Name	Quality assurance/ quality control of inspections
Description	<p>PacifiCorp does not have a specific asset management and inspections wildfire mitigation program focused on quality assurance/quality control of inspections. Instead, PacifiCorp leverages the company's standard quality assurance / quality control programs targeted at the complete portfolio of inspections, to include those performed within Tier 2 and Tier 3.</p> <p>The company's standard quality assurance / quality control programs includes physical audits of annual random selection of inspected facilities and quarterly review of condition records by a centralized team for quality and adherence to policies and procedures.</p>
Timeline to Minimize Risk [Planned/ Implemented]	Implemented
Rationale for Program	The quality and completeness of inspections directly impacts PacifiCorp's ability to detect and mitigate potential wildfire risk. PacifiCorp's quality assurance and quality control of inspections programs are designed to monitor both the quality of the inspection itself as well as the records associated with findings with the intent to continuously learn and improve both the knowledge base of inspectors and data quality of records.
Prioritization Approach	No prioritization applied to this program.
Plan for audits/quality checks	No audits/quality checks are appropriate for a quality check program.
Planned demonstration of effectiveness over time	Reduction in audit findings identified and data quality errors detected over time will demonstrate effectiveness of this program.

Planned Evolution	General	While PacifiCorp's current quality assurance / quality control processes have been historically accurate, the company recognizes that program evolution will be critical as PacifiCorp introduces new programs or amends existing programs, especially those pertaining to wildfire mitigation. As PacifiCorp is early in its WMP implementation, it is challenging to know exactly how and when the evolution of quality assurance / quality control programs will be necessary, but, PacifiCorp anticipates that these programs will evolve in some way.
	Before the upcoming wildfire season	Not planned at this time.
	Before the next annual update	Not planned at this time.
	Within the next 3 years	PacifiCorp anticipates that the scope of this program may grow and frequency of review may change at this time.
	Within the next 10 years	PacifiCorp anticipates that the scope of this program may grow and frequency of review may change at this time.

5.3.4.15 Substation inspections

Program Name	Asset management and inspections
Initiative Name	Substation inspections
Description	<p>PacifiCorp does not have a specific asset management and inspections wildfire mitigation program focused on substation inspection and, instead, considers its standard substation inspection program to include inspections of substations within the HFTD to mitigate wildfire risk.</p> <p>As a part of this program, qualified personnel inspects PacifiCorp's substations in California on a monthly basis which includes the assessment of physical safety, security, and performance of substation components, including fencing, grounding, and major equipment, as well as the performance of minor housekeep tasks to ensure safe and reliable service.</p>
Timeline to Minimize Risk [Planned/ Implemented]	Implemented
Rationale for Program	Compliance with General Order 174
Prioritization Approach	No specific prioritization within the program outside of adherence to California General Order 174
Plan for audits/quality checks	See Section 5.3.4.14
Planned demonstration of effectiveness over time	Demonstrated effectiveness includes the identification of corrective work and reduction in ignition probability drivers such as fault events associated with substation equipment failure.

Planned Evolution	General	No planned evolution at this time
	Before the upcoming wildfire season	No planned evolution at this time
	Before the next annual update	No planned evolution at this time
	Within the next 3 years	No planned evolution at this time
	Within the next 10 years	No planned evolution at this time

5.3.4.16 Other / not listed [only if an initiative cannot feasibly be classified within those listed above]

Program Name	Asset management and inspections
Initiative Name	Other / not listed [only if an initiative cannot feasibly be classified within those listed above]
Description	PacifiCorp does not, at this time, have any other asset management and inspections wildfire mitigation programs.

The following table summarizes all elements of PacifiCorp's asset management and inspections wildfire mitigation programs. The 2019 WMP did not include specific annual requirements and, therefore, PacifiCorp only provided the total proposed program units and costs. Including any 2019 plan values for WMP programs contemplated in the company's 2019 WMP would be confusing and not helpful in understanding progress or the company's overall programs as these values reflect the total multi-year program proposals.

Table 24: Asset management and inspections

Initiative activity	Year	Line miles to be treated	Spend/treated line mile	Ignition probability drivers targeted	Risk reduction	risk-spend efficiency	Other risk drivers addressed	Existing/new	Existing: What proceeding has reviewed program	Memorandum account if new:	In/exceeding compliance with	Cite associated rule	Comments
1. Detailed inspections of distribution electric lines and equipment	2019 plan	474	\$382	All types of equipment failure; Contact from object	N/A	N/A	N/A	Existing	CA GO 95 & 165	N/A	In Compliance with Regulation	CA GO 95 & 165	Program incorporated new requirements in 2019
	2019 actual	473	\$383										
	2020	605	\$425										
	2021	486	\$529										
	2022	480	\$535										
	2020-2022 plan total	1,571	\$491										
2. Detailed inspections of transmission electric lines and equipment	2019 plan	62	\$516	All types of equipment failure; Contact from object	N/A	N/A	N/A	Existing	CA GO 95 & 165	N/A	In Compliance with Regulation	CA GO 95 & 165	Program incorporated new requirements in 2019
	2019 actual	62	\$516										
	2020	122	\$484										
	2021	236	\$250										
	2022	268	\$250										
	2020-2022 plan total	626	\$283										
3. Improvements of inspections	2019 plan	N/A - Elements already captured in other relevant programs	N/A - Elements already captured in other relevant programs	All types of equipment failure; Contact from object	N/A	N/A	N/A	New in 2019	CA GO 95 & 165	N/A	In Compliance with Regulation	CA GO 95 & 165	Program improvements already captured in other relevant programs
	2019 actual												
	2020												
	2021												
	2022												
	2020-2022 plan total												

Initiative activity	Year	Line miles to be treated	Spend/treated line mile	Ignition probability/ drivers targeted	Risk reduction	risk-spend efficiency	Other risk drivers addressed	Existing/new	Existing: What proceeding has reviewed program	Memorandum account	In/exceeding compliance with	Cite associated rule	Comments
4. Infrared inspections of distribution electric lines and equipment	2019 plan	At this time, PacifiCorp does not have a specific asset management and inspections wildfire mitigation program focused on the infrared inspections of distribution electric lines and equipment. As a part of the company's 2019 wildfire mitigation efforts, the use of infrared technology was applied to transmission lines which is further discussed in Section 5.3.4.5. Depending on the results of this pilot project, PacifiCorp may pursue an extension of this pilot project to include distribution lines. However, the collection methodology and quality of inspection difficulties will need to be evaluated as PacifiCorp's distribution lines tend to be located in areas with a tree canopy, making efficient collection of valuable IR data challenging.											
	2019 actual												
	2020												
	2021												
	2022												
	2020-2022 plan total												
5. Infrared inspections of transmission electric lines and equipment	2019 plan	784	\$153	All types of equipment failure; Contact from object	N/A	N/A	N/A	New in 2019 (Pilot)	N/A	2019 WMP Memorandum Account	Exceeding Regulations	CA GO 95 & 165	New pilot program planning to evolve; No clear values beyond 2020 yet
	2019 actual	1,246	\$155										
	2020	232	\$190										
	2021	TBD	TBD										
	2022	TBD	TBD										
	2020-2022 plan total	TBD	TBD										
6. Intrusive pole inspections	2019 plan	92	\$880	All types of equipment failure;	N/A	N/A	N/A	Existing	CA GO 165	N/A	In Compliance with Regulation	CA GO 95 & 165	Existing historic compliance based program
	2019 actual	92	\$880										
	2020	150	\$1,484										
	2021	226	\$987										
	2022	230	\$970										
	2020-2022 plan total	606	\$1,104										
7. LiDAR inspections of distribution electric lines and equipment	2019 plan	250	\$520	All types of equipment failure; Contact from object	N/A	N/A	N/A	New in 2019 (Pilot)	2019 CA WMP	2019 WMP Memorandum Account	Exceeding Regulations	CA GO 95 & 165	New pilot program planning to evolve; No clear values beyond 2020
	2019 actual	376	\$491										
	2020	TBD	TBD										
	2021	TBD	TBD										
	2022	TBD	TBD										
	2020-2022 plan total	TBD	TBD										
8. LiDAR inspections of transmission electric lines and equipment	2019 plan	0	0	All types of equipment failure; Contact from object	N/A	N/A	N/A	New in 2019 (Pilot)	2019 CA WMP	2019 WMP Memorandum Account	Exceeding Regulations	CA GO 95 & 165	New pilot program planning to evolve; No clear values beyond 2020
	2019 actual	548	\$491										
	2020	TBD	TBD										
	2021	TBD	TBD										
	2022	TBD	TBD										
	2020-2022 plan total	TBD	TBD										

Initiative activity	Year	Line miles to be treated	Spend/treated line mile	Ignition probability drivers targeted	Risk reduction	risk-spend efficiency	Other risk drivers addressed	Existing/new	Existing: What proceeding has reviewed program	Memorandum account	In/exceeding compliance with	Cite associated rule	Comments
9. Other discretionary inspection of distribution electric lines and equipment, beyond inspections mandated by rules and regulations	2019 plan	At this time, PacifiCorp does not have any specific asset management and inspections wildfire mitigation programs focused on other discretionally inspection of distribution lines not included in other programs.											
	2019 actual												
	2020												
	2021												
	2020-2022 plan total												
10. Other discretionary inspection of transmission electric lines and equipment, beyond inspections mandated by rules and regulations	2019 plan	At this time, PacifiCorp does not have any specific asset management and inspections wildfire mitigation programs focused on other discretionally inspection of transmission lines not included in other programs.											
	2019 actual												
	2020												
	2021												
	2020-2022 plan total												
11. Patrol inspections of distribution electric lines and equipment	2019 plan	2,002	\$161	All types of equipment failure; Contact from object	N/A	N/A	N/A	Existing	CA GO 165	N/A	In Compliance with Regulation	CA GO 95 & 165	Program incorporated new requirements in 2019;
	2019 actual	2,002	\$161										
	2020	1,941	\$135										
	2021	2018	\$130										
	2022	1941	\$135										
	2020-2022 plan total	5,900	\$133										
12. Patrol inspections of transmission electric lines and equipment	2019 plan	718	\$273	All types of equipment failure; Contact from object	N/A	N/A	N/A	Existing	CA GO 165	N/A	In Compliance with Regulation	CA GO 95 & 165	Program incorporated new requirements in 2019
	2019 actual	718	\$273										
	2020	657	\$298										
	2021	767	\$256										
	2022	767	\$256										
	2020-2022 plan total	2,191	\$268										
13. Pole loading assessment program to determine safety factor	2019 plan	Pole loading to accommodate safety factors and necessary specifications are included in PacifiCorp's engineering and construction standards. At this time, PacifiCorp does not have a specific asset management and inspections wildfire mitigation program focused on pole loading assessment to determine safety factor of in-service assets. Specific pole loading assessment of in-service assets was included as a subset to the methodology of PacifiCorp's pole replacement programs included in Section 5.3.3.6. Where appropriate, pole loading assessment of new construction has also been incorporated into the new standards developed included in Section 5.3.3.6.											
	2019 actual												
	2020												
	2021												
	2022												
	2020-2022 plan total												

Initiative activity	year	Line miles to be treated	Spend/treated line mile	Ignition probability drivers targeted	Risk reduction	risk-spend efficiency	Other risk drivers addressed	Existing/new	Existing: What proceeding has reviewed program	Memorandum account	In/exceeding compliance with	Cite associated rule	Comments
14. Quality assurance/ quality control of inspections	2019 plan	N/A - Elements already captured in other relevant programs	N/A - Elements already captured in other relevant programs	All	N/A	N/A	N/A	Existing	N/A	N/A	N/A	N/A	General program and best practices applied to an accounted for in other relevant programs
	2019 actual												
	2020												
	2021												
	2020-2022 plan total												
15. Substation inspections	2019 plan	444	\$405	All types of equipment failure; Contact from object	N/A	N/A	N/A	Existing	CA GO 174	N/A	In Compliance with Regulation	CA GO 174	Values reported indicate number of substation inspections completed or planned and \$/inspection
	2019 actual	439	\$394										
	2020	444	\$400										
	2021	444	\$400										
	2022	444	\$400										
	2020-2022 plan total	1,332	\$400										
16.Other/not listen [only is an initiative cannot feasibly be classified within those listen above]	2019 plan	PacifiCorp does not, at this time, have any other asset management and inspections wildfire mitigation programs.											
	2019 actual												
	2020												
	2021												
	2022												
	2020-2022 plan total												

5.3.5 *Vegetation management and inspections*

PacifiCorp's vegetation management program is designed to address the risks that trees growing into or near power lines can create safety and service reliability risks. The overall objective is to minimize vegetation related faults, including any faults which could be a source of fire ignition. PacifiCorp's vegetation management program is compliant with GO 95, Rule 35, and is described in detail in PacifiCorp's Transmission & Distribution Vegetation Management Program Standard Operating Procedures (Standard Operating Procedures).

PacifiCorp's existing Vegetation Management Program is consistent with GO 95, Rule 35 (as recently amended) and is generally described below. To supplement existing programs, Table 25 includes a summary of PacifiCorp's California vegetation management fire risk mitigation plan, reflecting new programs which exceed current regulatory requirements. Additional detailed information for each program has been included in the following subsections.

Existing Tactics and Strategies

Fully described in PacifiCorp's Standard Operating Procedures, the core of vegetation management efforts are directed to two primary areas. Like other utilities, PacifiCorp prunes vegetation to maintain a safe distance between tree limbs and power lines; PacifiCorp also identifies and removes hazard trees. Like other utilities, PacifiCorp contracts with vegetation management service providers to perform pruning and tree removal work.

Maintaining safe clearances is the starting point of any utility vegetation management plan, including PacifiCorp's. From an overall perspective, it is important to note that there is a distinct set of procedures for vegetation management work on distribution circuits and another set of procedures for vegetation management work on transmission lines.

Vegetation management of distribution circuits centers on cycle work. In areas without an elevated risk, regular vegetation management work on any particular circuit is done every two years; full clearance work is done on a four year cycle, with interim work at the two year mark between each cycle. In the HFTD, however, regular vegetation management work is done annually, consistent with current regulations.

Vegetation management on transmission lines focus on maintaining extended clearances and employing practices to prevent any future vegetation growth disrupting clearances. Because of the nature of transmission lines, wider rights-of-way allow PacifiCorp to generally maintain clearances well in excess of the Minimum Vegetation Clearance Distance (MVCD) required in Table 2 of FAC-003-04.⁴² Accordingly, rather than scheduling vegetation management work for transmission lines on a fixed cycle timeframe, such work is scheduled on an as-needed basis, dependent on the results of regular inspections and specific local conditions. In addition, PacifiCorp vegetation management endorses IVM as industry best practice.

IVM essentially tries to prevent any clearance issue from ever emerging, by managing the species of trees (and other vegetation) growing in the right-of-way. Under such an approach, tall growing trees are removed long before there is any issue with clearance requirements.

In addition to clearance work, removal of hazard trees is a key overall strategy for both distribution and transmission vegetation management. This strategy is discussed in greater detail, in subsection implemented tactics and strategies below.

There are other notable “tactics” specifically geared towards mitigating the wildfire risk. Consistent with PRC § 4292 and 4293, PacifiCorp requires a ten foot cylinder of clear space from pole top to bare ground around “subject” poles in state regulated areas. When appropriate, bare-ground herbicide treatments are used to keep the ten foot cylinder clear of vegetation. Vegetation management crews working in fire-prone areas are required to adhere to fire restrictions and to receive training related to fire prevention and suppression.

Many other strategies and tactics described in the Standard Operating Procedures support (even if only indirectly) the overall objective of reducing vegetation related faults. Any fault occurring in the HFTD is considered a wildfire ignition risk. Consequently, all such strategies and tactics are incorporated as part of PacifiCorp’s 2020 WMP. For example, the Standard Operating Procedures includes strategies and tactics for obtaining property owner approval for tree removals, thereby supporting the overall strategy of removing hazard trees.

Very generally, all of the tactics and strategies in the Standard Operating Procedures are “existing” practices. The current form of the Standard Operating Procedures was first published in 2008, and periodic updates to content have been made. The most current version is Revision 07, dated August 19, 2019.

Implemented 2019 Tactics and Strategies

PacifiCorp has implemented other new elements to its vegetation management program. Along these lines, PacifiCorp performed specific wildfire mitigation projects in 2018 and 2019. Applying this experience, PacifiCorp has implemented new vegetation management processes to mitigate wildfire risk. PacifiCorp vegetation management will complete annual vegetation inspections on all lines in the HFTD. Correction work will be completed based on those inspection results. This is a change from previous practices because additional inspection and correction work is being done on lines which would otherwise not have been scheduled for inspection and work under the previous schedule for regular cycle maintenance work on distribution lines. Correction work will also target reduction of overhang, prompt removal of hazard trees, and more aggressive removal of higher risk trees.

Collaboration with Local Land Managers

PacifiCorp routinely collaborates with local land managers in obtaining permits, scheduling work, and addressing particular issues as they arise during the course of work. PacifiCorp works closely with various local offices of federal agencies to ensure there are approval processes in place for vegetation management work, including hazard tree removals. Annual meetings are held with some agencies to enhance communication on

authorization permits and upcoming vegetation management work on federal properties.

From a larger perspective, PacifiCorp has worked with and made joint efforts with the Edison Electric Institute and other utilities to collaborate with federal agencies to expedite approvals for vegetation management work on transmission and distribution facilities. PacifiCorp representatives participated in the drafting of an agreement specifically aimed at building collaboration between the federal agencies and the utilities on these issues. As a result, the Memorandum of Understanding on Vegetation Management for Powerline Rights-of-Way, dated September 29, 2016, was signed by the Edison Electric Institute, Utility Arborist Association, the National Park Service, United States Fish and Wildlife Service, Bureau of Land Management (BLM), United States Forest Service, and the United States Environmental Protection Service. The purpose of the MOU is to facilitate cooperation and coordination among the parties regarding vegetation management within and immediately adjacent to existing and future powerline right of ways and associated facilities. The MOU facilitates “implementation of cost effective and environmentally sound vegetation management plans, procedures, and practices for powerline ROWs that will reduce adverse environmental and cultural impacts while enhancing the ability of utilities to provide uninterrupted electrical service to customers and address public safety.” (MOU at 4.)

These efforts culminated in the recent passage of legislation by the United States Congress. Section 211 of the Omnibus Appropriations Act of 2018 amended Title V of the Federal Land Policy and Management Act. The new law, codified at 43 U.S.C.A. § 1772, establishes a formal procedure for submission and approval of vegetation management plans, with an emphasis on standardized, consistent plans and minimizing the need for case-by-case approvals for hazard tree removal. PacifiCorp understands that the BLM and the USFS, the two federal agencies responsible for the lands where PacifiCorp’s rights-of-way are located, are engaged in a rulemaking to “develop a consolidated and coordinated process for the review and approval of plans.” 43 U.S.C.A. § 1772(c)(4)(A). When those regulations are finalized, PacifiCorp plans to submit a vegetation management plan under 43 U.S.C.A. § 1772(c)(1) to both the BLM and the USFS.

In conformance with 43 U.S.C.A. § 1772, the vegetation management plan may be part of an existing plan, which may be a larger Operations and Maintenance Plan (O&M Plan), as such PacifiCorp has initiated coordination with federal land managing agencies in California, to develop an O&M Plan(s) to establish agreed upon agency review times of proposed maintenance activities based on activity type and presence or absence of sensitive resources that may be impacted. The O&M Plan will outline measures to be implemented by PacifiCorp for the protection of sensitive resources based on maintenance activity type, including vegetation management activities. The O&M Plan will also include agreed upon roles and responsibilities of PacifiCorp and the applicable land managing agency to support PacifiCorp’s rapid response to correct conditions identified, including vegetation management conditions, in a timely manner. The service area of the O&M Plan may be forest or field office specific or agency specific, which will be determined through further coordination with the land managing agencies. To ensure consistent application of the O&M Plan across a forest, field office, or PacifiCorp’s footprint within a land managing agency, PacifiCorp is also coordinating the development of a Master Permit(s), which is a consolidation of existing right-of-way grants or special use permits within a single or multiple field offices or forests, respectively. The Master Permit(s) will include by reference the O&M Plan and ensure consistent application of the O&M Plan across the applicable jurisdictional boundary. Currently, PacifiCorp is coordinating this effort with the Klamath National Forest and has approached the topic with other

forests within Northern California. PacifiCorp anticipates completion of an O&M Plan with the Klamath National Forest by end of year, 2020.

The following subsections include detailed descriptions regarding PacifiCorp's specific vegetation management and inspections wildfire mitigation programs.

5.3.5.1 Additional efforts to manage community environmental impacts

Program Name	Vegetation management and inspections
Initiative Name	Additional efforts to manage community environmental impacts
Description	<p>As described above, PacifiCorp collaborates with local emergency responders or state organizations as needed to reduce fuel and facilitate improved escape or evacuation routes. For example, in 2019 Governor Gavin Newsom directed CALFIRE to determine which communities within each county had the greatest wildfire risk. CALFIRE determined the Lake Shastina area as one of the high priority project areas. As a result, PacifiCorp partnered with CALFIRE in Big Springs, California on the Lake Shastina Fuels Reduction Project to improve escape routes for residents and access for emergency responders.</p> <p>This project involved clearing 100 feet on each side of road of State Highway 97, Big Springs Road and 2 miles west on Jackson Ranch Road. Any utility distribution or transmission facilities that fell within the 100' clearing were also targeted for tree removal in associated rights of ways. Trees and vegetation that had potential to grow into facilities (non-compatible vegetation) and brush were removed in a distribution utility corridor and 2 transmission corridors that fell within the footprint of the CALFIRE fuel reduction project. CALFIRE also removed all brush species, thinned small trees to provide 20-30' spacing and pruned all remain trees 6-8' above ground.</p> <p>While collaboration such as this is critical to the overall reduction of wildfire risk in the state of CA, PacifiCorp, at this time, does not have a specific program dedicated to this effort. Instead, these efforts are on an as-needed basis and incorporate additional efforts to manage community environments within other programs, such as those included in Section 5.3.9 and Section 5.3.10.</p>

5.3.5.2 Detailed inspections of vegetation around distribution electric lines and equipment

Program Name	Vegetation management and inspections
Initiative Name	Detailed inspections of vegetation around distribution electric lines and equipment
Description	<p>PacifiCorp regularly inspects its lines and facilities as described in Sections 5.3.4.1. These inspections, include, as a component, the identification of imminent threats, including high risk vegetation.</p> <p>Additionally, PacifiCorp's vegetation management program includes conducting inspections on distribution lines in advance of distribution cycle maintenance work. Accordingly, pre-work inspections are done immediately prior to the cycle work to identify which trees will be worked in the cycle, which would also include correction of any imminent threats or hazards.</p> <p>Beginning in 2019, PacifiCorp implemented an additional vegetation management inspection of all overhead lines in HFTD areas in California. Although conducting annual vegetation inspections exceeds previous levels of inspections to maintain regulatory requirements, PacifiCorp vegetation management believes that this tool is the most effective strategy to identify high risk trees at the earliest stage possible. This strategy facilitates removal of high risk trees before such trees could ever fall into a line and cause a wildfire, consistent with GO95 requirements.</p> <p>Each year, prior to the height of fire season, a vegetation inspection is conducted in the HFTD. Consistent with existing procedures, a Level 1⁴³ assessment is conducted to identify any trees which may have become high risk trees over the course of the prior year; suspect trees are subjected to a Level 2⁴⁴ assessment, as outlined in ANSI A300 (Part 9). In addition, the inspector will identify for pruning or removal vegetation which is likely to violate minimum clearance distances prior to the next annual inspection.</p> <p>In conjunction with such annual inspections, vegetation management annually completes correction work based on the inspection results, including the prompt removal of all high risk trees identified during the annual vegetation inspection.</p>

⁴³ A Level 1 assessment does not have the same meaning or requirements as a Level 1 condition.

⁴⁴ A Level 2 assessment does not carry the same meaning or requirements as a Level 2 condition.

Timeline to Minimize Risk [Planned/ Implemented]		Implemented
Rationale for Program		<p>Trees growing into or near power lines can create safety and service reliability risks. Therefore, PacifiCorp's detailed inspections of vegetation around distribution electric lines and equipment includes focused vegetation inspections within the HFTD to identify both planned cycle work as well as imminent threats with an overall objective is to minimize vegetation related faults, including any faults which could be a source of fire ignition.</p> <p>Additionally, this program facilitates the identification of any vegetation issues that have ignition probability in compliance with GO95.</p>
Prioritization Approach		<ul style="list-style-type: none"> • Top priority at PacifiCorp to complete inspections per compliance requirements. • New inspection elements focused on HFTD locations.
Plan for audits/quality checks		See Section 5.3.5.13
Planned demonstration of effectiveness over time		Demonstrated effectiveness of this program is the identification of corrective work and reduction in ignition potential through the identification and mitigation of vegetation related conditions.
Planned Evolution	General	As with all of PacifiCorp's programs, the company intends to implement these processes, pilot new technologies or methods where appropriate, and translate lessons learned or effectiveness into program modification and evolution.
	Before the upcoming wildfire season	No planned evolution
	Before the next annual update	No planned evolution

	Within the next 3 years	As PacifiCorp continues to implement its multi-year WMP, the company will continue to evaluate how inspections may be improved by either changes to scope, tools, frequency, or correction timeframe. While PacifiCorp is early in the implementation of its multi-year WMP, PacifiCorp anticipates incorporating changes within the next three years. Additionally, as included in Section 5.3.5.6, PacifiCorp is beginning implementation of an electronic planning and tracking system to include specific GIS locations and detailed descriptions of required work as well as records of completed activities. PacifiCorp anticipates that this planning and tracking system will be fully implemented and incorporated in all facets of the company's vegetation management program within the next three years.
	Within the next 10 years	Continued evolution of planning and tracking systems. Monitor of existing programs, pilot new technologies or methods where appropriate, and translate lessons learned or effectiveness into program modification and evolution.

5.3.5.3 Detailed inspections of vegetation around transmission electric lines and equipment

Program Name	Vegetation management and inspections
Initiative Name	Detailed inspections of vegetation around transmission electric lines and equipment
Description	<p>PacifiCorp regularly inspects its lines and facilities as described in Section 5.3.4.2. These inspections, include, as a component, the identification of imminent threats, including high risk vegetation.</p> <p>Similar to PacifiCorp’s detailed inspections of vegetation around distribution electric lines and equipment, PacifiCorp’s detailed inspections of vegetation around transmission electric lines and equipment focus on maintaining clearances, but with transmission, the clearance distances are much greater. Because of the nature of transmission lines, wider rights-of-way generally allow PacifiCorp to maintain clearances well in excess of the required minimum clearances set forth in the “Minimum Vegetation Clearance Distance” (MVCD).⁴⁵ Accordingly, rather than scheduling vegetation management work for transmission lines on a fixed cycle timeframe, such work is scheduled on an as-needed basis, depending on the results of regular inspections and specific local conditions. To determine whether work is needed, an “Action Threshold” is applied, meaning that work is done if vegetation has grown within the action threshold distance. Additionally, PacifiCorp employs “Integrated Vegetation Management” (IVM) practices to prevent vegetation growth from ever violating clearances which are further described in Section 5.3.5.20.</p> <p>Beginning in 2019, PacifiCorp implemented an additional vegetation management inspection for all overhead lines in HFTD areas in CA. Although conducting annual vegetation inspections exceeds previous levels of inspections to maintain regulatory requirements, this tool is the most effective strategy to identify high risk trees at the earliest stage possible. This strategy facilitates removal of high risk trees before such trees could ever fall into a line and cause a wildfire, consistent with GO95 requirements.</p> <p>Each year, prior to the height of fire season, a vegetation inspection is conducted in the HFTD. Consistent with existing procedures, a Level 1 assessment is conducted to identify any trees which may have become high risk trees over the course of the prior year; suspect trees are subjected to a Level 2 assessment, as outlined in ANSI A300 (Part 9). In addition, the inspector will identify for pruning or removal vegetation which is likely to violate minimum clearance distances prior to the next annual inspection.</p>

⁴⁵ See Table 2 of FAC-003-04, available at <https://www.nerc.com/pa/Stand/Reliability%20Standards/FAC-003-4.pdf>

		In conjunction with such annual inspections, vegetation management annually completes correction work based on the inspection results, including the prompt removal of all high risk trees identified during the annual vegetation inspection.
	Timeline to Minimize Risk [Planned/ Implemented]	Implemented
	Rationale for Program	<p>Trees growing into or near power lines can create safety and service reliability risks. Therefore, PacifiCorp's detailed inspections of vegetation around distribution electric lines and equipment includes focused vegetation inspections within the HFTD to identify both planned cycle work as well as imminent threats with an overall objective is to minimize vegetation related faults, including any faults which could be a source of fire ignition.</p> <p>Additionally, this program facilitates the identification of any vegetation issues that have ignition probability in compliance with GO95.</p>
	Prioritization Approach	<ul style="list-style-type: none"> • Top priority at PacifiCorp to complete inspections per compliance requirements. • New inspection elements focused on HFTD locations
	Plan for audits/quality checks	See Section 5.3.5.13
	Planned demonstration of effectiveness over time	Demonstrated effectiveness of this program is the identification of corrective work and reduction in ignition potential through the identification and mitigation of vegetation related conditions.
Planned Evolution	General	As with all of PacifiCorp's programs, the company intends to implement these processes, pilot new technologies or methods where appropriate, and translate lessons learned or effectiveness into program modification and evolution.
	Before the upcoming wildfire season	No planned evolution

	Before the next annual update	No planned evolution
	Within the next 3 years	As PacifiCorp continues to implement its multi-year WMP, the company will continue to evaluate how inspections may be improved by either changes to scope, tools, frequency, or correction timeframe. While PacifiCorp is early in the implementation of its multi-year WMP, PacifiCorp anticipates incorporating changes within the next three years. Additionally, as included in Section 5.3.5.6, PacifiCorp is beginning implementation of an electronic planning and tracking system to include specific GIS locations and detailed descriptions of required work as well as records of completed activities. PacifiCorp anticipates that this planning and tracking system will be fully implemented and incorporated in all facets of the company's vegetation management program within the next three years.
	Within the next 10 years	Continued evolution of planning and tracking systems. Monitor of existing programs, pilot new technologies or methods where appropriate, and translate lessons learned or effectiveness into program modification and evolution.

5.3.5.4 Emergency response vegetation management due to red flag warning or other urgent conditions

Program Name	Vegetation management and inspections
Initiative Name	Emergency response vegetation management due to red flag warning or other urgent conditions
Description	<p>While PacifiCorp is committed to executing the company’s planned vegetation management programs, circumstances may still arise where, due to unexpected conditions such as weather, additional risk can be mitigated through supplemental vegetation inspections and trimming. When PacifiCorp activates its emergency response procedures and programs, vegetation management is involved to support the emergency event, generally performing additional inspections and vegetation management or clearing activity with qualified personnel and crews as required by operations.</p> <p>As these vegetation management specific components are critical to the success of PacifiCorp’s emergency response programs and grid operations and protocols, the emergency response vegetation management due to red flag warning or other urgent conditions is a subset and component of both the company’s general emergency response plans and the company’s grid operations and protocols wildfire mitigation program focused on personnel work procedures and training conditions of elevation fire risk. Therefore, PacifiCorp does not at this time have a specific vegetation management and inspections wildfire mitigation program focused on Emergency response vegetation management due to red flag warning or other urgent conditions. See Section 5.3.6.3 and Section 5.3.9.</p>

5.3.5.5 Fuel management and reduction of “slash” from vegetation management activities

Program Name	Vegetation management and inspections
Initiative Name	Fuel management and reduction of “slash” from vegetation management activities
Description	<p>The completion of both planned and emergency vegetation management work can, in some instances, create smaller vegetation materials such as brush, tree limbs, or shrubs less than six inches in diameter a byproduct, also referred to as “slash.” This byproduct can be located either on the ground along the right of way or above ground within the tree canopy or other existing vegetation.</p> <p>The presence of “slash” from vegetation management activities can contribute to the overall fuel availability along a utility right-of-way. A potential spark event, regardless of the cause, can lead to a potential ignition event if the weather conditions and availability of fuel is sufficient. To reduce the probability that a potential spark event can lead to a potential ignition, PacifiCorp performs fuel management and reduction of “slash” from vegetation management activities. PacifiCorp’s fuel management and reduction of “slash” from vegetation management activities, which are described further within the company’s Transmission and Distribution Vegetation Management Program Standard Operating Procedures manual, focus on ensuring that these materials are not left within the tree canopy and that they are disposed of properly to reduce the volume of available fuel within the right of way.</p> <p>While critical to the success of PacifiCorp’s overall vegetation management and inspections wildfire mitigation strategy, the Fuel management and reduction of “slash” from vegetation management activities is a component of the company’s vegetation management to achieve clearances around electric lines and equipment. See Section 5.3.5.20.</p>

5.3.5.6 Improvement of inspections

Program Name	Vegetation management and inspections
Initiative Name	Improvement of inspections
Description	<p>While PacifiCorp’s traditional vegetation management and inspections programs are effective at maintaining regulatory compliance and managing routine operational risk, they also mitigate wildfire risk through the maintenance of vegetation clearances, identification of vegetation threats, and removal of fuel within the right of way. Nonetheless, recognizing the growing risk of wildfire and changing regulatory conditions, PacifiCorp designed and incorporated additional elements to supplement the company’s standard vegetation management and inspections programs, mitigate the growing wildfire specific operational risks, and create greater resiliency against wildfires.</p> <p>Based on pilot trials in 2018, PacifiCorp implemented three new elements to its long-term vegetation management program for the purpose of further mitigating wildfire risk in the HFTD. First, PacifiCorp vegetation management has implemented annual vegetation inspections on all lines in the HFTD, with correction work also done based on those inspection results. Second, vegetation management increased the minimum ending distances applicable to distribution cycle work completed in the HFTD. Third, vegetation management expanded annual pole clearing on subject equipment poles located in the HFTD. In addition, PacifiCorp is evaluating and working to implement electronic and GIS-based planning, tracking, and recording of vegetation management activities.</p> <p>Annual Vegetation Inspection: As described in Section 5.3.5.2 and 5.3.5.3, beginning in 2019, PacifiCorp implemented an additional vegetation management inspection all overhead lines in HFTD areas in CA. Although conducting annual vegetation inspections exceeds previous levels of inspections to maintain regulatory requirements, this tool is the most effective strategy to identify high risk trees at the earliest stage possible. This strategy facilitates removal of high risk trees before such trees could ever fall into a line and cause a wildfire, consistent with GO95 requirements.</p> <p>Each year, prior to the height of fire season, a vegetation inspection is conducted in the HFTD. Consistent with existing procedures, a Level 1 assessment is conducted to identify any trees which may have become high risk trees over the course of the prior year; suspect trees are subjected to a Level 2 assessment, as outlined in ANSI A300 (Part 9). In addition, the inspector will identify for pruning or removal vegetation which is likely to violate minimum clearance distances prior to the next annual inspection.</p>

In conjunction with such annual inspections, vegetation management annually completes correction work based on the inspection results, including the prompt removal of all high risk trees identified during the annual vegetation inspection.

Extended Clearances: As described in Section 5.3.5.20, for any distribution cycle work in the HFTD, regardless of applicable cycle, PacifiCorp adopted increased minimum clearance specifications beginning in 2020. The new minimum clearance specifications require pruning to at least twelve (12) feet, in all directions and for all types of trees. As discussed in Section 5.3.5.20, minimum clearance specifications dictate the distance achieved after pruning is completed. By increasing the minimum distance required at the time pruning is done, PacifiCorp further minimizes the potential of vegetation contacting a power line at any time.

By increasing distances to at least twelve feet, PacifiCorp vegetation management will meet or exceed industry standards and best practices. This practice also aligns with the both the California Public Utilities Commission issued new requirement to maintain four feet clearance at all times in the California High Fire Threat District, as well as the recommended, in the Appendix E Guidelines of GO 95, Rule 35, to use a minimum clearance specification of twelve feet. By using a greater clearance specification for fast growing trees, and for the under and overhang clearance on moderate growing trees, PacifiCorp goes beyond the CPUC's recommendation.

Pole Clearing: As included in Section 5.3.5.9, PacifiCorp vegetation management has implemented expanded pole clearing in addition to previous programs and regulations on subject equipment poles located in the HFTD. Pole clearing involves removing all vegetation within a ten-foot radius cylinder of clear space around a subject pole and applying herbicides and soil sterilants to prevent any vegetation regrowth (unless prohibited by law or the property owner). This strategy is distinct from additional clearance and removal activities and requirements because it is not designed to prevent contact between vegetation and a power line. Instead, similar to "slash management", pole clearing is designed to reduce the risk of fire ignition if sparks are emitted from electrical equipment. Pole clearing will be performed on wildland vegetation in the HFTD around poles which have fuses, air switches, clamps or other devices that could create sparks. After a pole has been cleared, a spark falling within the 10-foot radius would be much less likely to ignite a fire.

Electronic Tracking and Database: Historically, PacifiCorp has tracked vegetation management activities at the local level, generally relying on paper forms, maps, documents, and local knowledge. In recognition of growing wildfire risk, and move toward improved transparency, efficiency, and data analytics, PacifiCorp is planned to incorporate and pilot the use of the utility's electronic database programs to identify, plan, track, and record completion of vegetation

		management activities. Foresters will begin working the GIS department to secure digital maps consistent with the company's master version and use electronic forms and records to capture activities. This will facilitate additional granularity in reporting, additional record retention, and enhanced analytics.
	Timeline to Minimize Risk [Planned/ Implemented]	Implemented
	Rationale for Program	<p>The improvements to programs as included in this section are designed to:</p> <ul style="list-style-type: none"> • Ensure that distribution and transmission facilities are inspected appropriately and comply with CA GO95 requirements; • Reduce the potential for incidental contact through extended clearances; • Reduce the volume of fuel available through radial pole clearing; and • Provide additionally transparency and granularity of data to support enhanced data analytics and optimization.
	Prioritization Approach	<p>See individual programs for details.</p> <p>General prioritization includes completion of compliance based requirements and then completion of additional activities within the HFTD.</p>
	Plan for audits/quality checks	See Section 5.3.5.13
	Planned demonstration of effectiveness over time	Demonstrated effectiveness of this program is the identification of corrective work and reduction in ignition potential through the identification and mitigation of vegetation related conditions.
Planned Evolution	General	As with all of PacifiCorp's inspection programs, the company intends to implement these programs, pilot new technologies or methods where appropriate, and translate lessons learned or effectiveness into long term program modification and evolution. This same approach applies to the improvement of vegetation management activities and inspections.

	Before the upcoming wildfire season	No planned evolution
	Before the next annual update	Pilot new electronic planning, mapping, and record keeping system with the HFTD.
	Within the next 3 years	Continue evaluation and expansion of new electronic planning, mapping, and record keeping system.
	Within the next 10 years	Monitor existing programs, pilot new technologies or methods where appropriate, and translate lessons learned or effectiveness into program modification and evolution.

5.3.5.7 LiDAR inspections of vegetation around distribution electric lines and equipment

Program Name	Vegetation management and inspections
Initiative Name	LiDAR inspections of vegetation around distribution electric lines and equipment
Description	PacifiCorp does not have a specific vegetation management and inspections wildfire mitigation program focused on LiDAR inspections of vegetation around distribution electric lines and equipment. Instead, PacifiCorp incorporates, as a component, LiDAR inspections of vegetation around distribution lines and equipment in its LiDAR inspections of distribution electric lines and equipment program. See Section 5.3.4.7.

5.3.5.8 LiDAR inspections of vegetation around transmission electric lines and equipment

Program Name	Vegetation management and inspections
Initiative Name	LiDAR inspections of vegetation around transmission electric lines and equipment
Description	PacifiCorp does not have a specific vegetation management and inspections wildfire mitigation program focused on LiDAR inspections of vegetation around transmission electric lines and equipment. Instead, PacifiCorp incorporates, as a component, LiDAR inspections of vegetation around transmission lines and equipment in its LiDAR inspections of transmission electric lines and equipment program. See Section 5.3.4.8.

5.3.5.9 Other discretionary inspection of vegetation around distribution electric lines and equipment, beyond inspections mandated by rules and regulations

Program Name	Vegetation management and inspections
Initiative Name	Other discretionary inspection of vegetation around distribution electric lines and equipment, beyond inspections mandated by rules and regulations
Description	At this time, PacifiCorp does not have any other discretionary inspection of vegetation around transmission electric lines and equipment, beyond inspections mandated by rules and regulations, and other described programs.

5.3.5.10 Other discretionally inspection of vegetation around transmission electric lines and equipment beyond inspections mandated by rules and regulations

Program Name	Vegetation management and inspections
Initiative Name	Other discretionary inspection of vegetation around transmission electric lines and equipment, beyond inspections mandated by rules and regulations
Description	At this time, PacifiCorp does not have any other discretionary inspection of vegetation around transmission electric lines and equipment, beyond inspections mandated by rules and regulations, and other described programs.

5.3.5.11 Patrol inspections of vegetation around distribution electric lines and equipment

Program Name	Vegetation management and inspections
Initiative Name	Patrol inspections of vegetation around distribution electric lines and equipment
Description	PacifiCorp's description of patrol inspections of vegetation around distribution electric lines and equipment is included in the company's description of detailed inspections of vegetation around distribution lines and equipment. See Section 5.3.5.2

5.3.5.12 Patrol inspections of vegetation around transmission electric lines and equipment

Program Name	Vegetation management and inspections
Initiative Name	Patrol inspections of vegetation around transmission electric lines and equipment
Description	PacifiCorp's description of patrol inspections of vegetation around transmission electric lines and equipment is included in the company's description of detailed inspections of vegetation around transmission lines and equipment. See Section 5.3.5.3

5.3.5.13 Quality assurance / quality control of inspections

Program Name	Vegetation management and inspections
Initiative Name	Quality assurance / quality control of inspections
Description	<p>PacifiCorp's Transmission and Distribution Vegetation Management Standard Operating Procedures manual includes the company's standard procedures and protocols for performing vegetation management audits.</p> <p>In general, this standard includes routine tree crew audits of transmission, distribution, post-inspection, and pole clearing activities where the primary purpose is an assessment of quality assurance. Each audit includes a Forester, crew leader, and, optionally, the Supervisor. During these audits, standard forms are used to capture any observations and exceptions along with comments, required corrective work, and feedback for the inspectors. Similar to PacifiCorp's other programs, if during the course of the audit, an exception is identified that violates either federal or state law or poses as imminent safety or reliability risk, the audit will be temporarily suspended, the crew may be shut down, and the corrective work will be performed immediately.</p> <p>These audits benefit both PacifiCorp and the Contractor and are considered a best management practice (American National Standards Institute 2006).</p>
Timeline to Minimize Risk [Planned/ Implemented]	Implemented
Rationale for Program	Auditing and quality of inspection is critical to ensure required work is being documented and listed and to ensure clearance or high risk trees are being identified for mitigation.
Prioritization Approach	PacifiCorp prioritizes focusing enhanced audit efforts within the HFTD to ensure work complies with regulations and reduces wildfire risk.
Plan for audits/quality checks	NA

Planned demonstration of effectiveness over time		Work audits provide key information to improve work quality and specification adherence. The identification of exceptions and an overall improvement in the quality of work is an effective quality assurance / quality control program.
Planned Evolution	General	As with all of PacifiCorp's programs, the company intends to implement these processes, pilot new technologies or methods where appropriate, and translate lessons learned or effectiveness into program modification and evolution.
	Before the upcoming wildfire season	No evolution planned at this time.
	Before the next annual update	As included in Section 5.3.5.6, PacifiCorp is planning to pilot a new electronic planning, mapping, and record keeping system with the HFTD. PacifiCorp anticipates that this new system will extend to all or a portion of the company's QA/QC procedures and processes within the next year.
	Within the next 3 years	<p>As PacifiCorp continues to implement its multi-year WMP, the company will continue to evaluate how inspections may be improved by either changes to scope, tools, frequency, or correction timeframe. While PacifiCorp is early in the implementation of its multi-year WMP, PacifiCorp anticipates incorporating changes within the next three years. Additionally, as included in Section 5.3.5.6, PacifiCorp is beginning implementation of an electronic planning and tracking system to include specific GIS locations and detailed descriptions of required work as well as records of completed activities. PacifiCorp anticipates that this planning and tracking system will be fully implemented and incorporated in all facets of the company's vegetation management program within the next three years.</p> <p>Furthermore, PacifiCorp is currently piloting the use of LiDAR technology to performed enhanced inspections of its distribution and transmission lines to inform and support, among other programs, the company's vegetation management programs. While not clear at this time, this pilot project may inform evolution of the company's overall vegetation management programs, including any QA/QC programs or program elements.</p>
	Within the next 10 years	No evolution planned at this time.

5.3.5.14 Recruiting and training of vegetation management personnel

Program Name	Vegetation management and inspections
Initiative Name	Recruiting and training of vegetation management personnel
Description	<p>PacifiCorp's general approach to recruiting and training of vegetation management personnel can be found in the company's Transmission and Distribution Vegetation Management Program Standard Operating Procedures manual. In general, PacifiCorp takes advantage of training that is provided by the company and arboriculture industry and issues materials as needed, such as a High Risk Tree Identification presentation created in 2019 to educate inspectors on proper identification of defective trees that have the potential to strike the facilities.</p> <p>PacifiCorp at this time does not have a vegetation management and inspections wildfire mitigation program focused on recruiting and training of vegetation management personnel.</p>

5.3.5.15 Remediation of at-risk species

Program Name	Vegetation management and inspections
Initiative Name	Remediation of at-risk species
Description	Remediation of at-risk species is a subset to the company's vegetation management to achieve clearances around electric lines and equipment program as it contains, as an element, the company's practices procedures, and funding to remediate at-risk species. See Section 5.3.5.18.

5.3.5.16 Removal and remediation of trees with strike potential to electric lines and equipment

Program Name	Vegetation management and inspections
Initiative Name	Removal and remediation of trees with strike potential to electric lines and equipment
Description	Removal and remediation of trees with strike potential to electric lines and equipment is a subset to the company's vegetation management to achieve clearances around electric lines and equipment program as it contains, as an element, the company's practices procedures, and funding to remove and remediate trees with strike potential to electric lines and equipment. See Section 5.3.5.18.

5.3.5.17 Substation inspections

Program Name	Vegetation management and inspections
Initiative Name	Substation inspections
Description	PacifiCorp's vegetation detailed inspection and correction program included in Sections 5.3.5.2 and 5.3.5.3, discretionary inspection included in 5.3.5.9, and overall management activities to achieve proper clearances in Section 5.3.5.20, include work in and around substations. Therefore, PacifiCorp does not have a specific vegetation management and inspections program focused on substation inspection. See Sections 5.3.5.2, 5.3.5.3, 5.3.5.9, and 5.3.5.20.

5.3.5.18 Substation vegetation management

Program Name	Vegetation management and inspections
Initiative Name	Substation vegetation management
Description	PacifiCorp's vegetation detailed inspection and correction program included in Sections 5.3.5.2 and 5.3.5.3, discretionary inspection included in 5.3.5.9, and overall management activities to achieve proper clearances in Section 5.3.5.20, include work in and around substations. Therefore, PacifiCorp does not have a specific vegetation management and inspections program focused on substation inspection. See Sections 5.3.5.2, 5.3.5.3, 5.3.5.9, and 5.3.5.20.

5.3.5.19 Vegetation inventory system

Program Name	Vegetation management and inspections
Initiative Name	Vegetation inventory system
Description	PacifiCorp recognizes the importance and value of creating and maintaining a vegetation inventory system. Such a system can help to assess risk, customize vegetation management programs, and optimize task assignment and execution. PacifiCorp does not have a defined vegetation inventory system program at this time. However, the company is currently evaluating required steps, funding, and technology requirements to develop, implement, and incorporate a new tree density inventory system targeted initially within the HFTD to inform risk assessment and prioritization of efforts. PacifiCorp is prioritizing this task, intends to evaluate in 2020, and provide an update and further program details in the next annual update.

5.3.5.20 Vegetation management to achieve clearances around electric lines and equipment

Program Name	Vegetation management and inspections
Initiative Name	Vegetation management to achieve clearances around electric lines and equipment
Description	<p>Maintaining safe clearances is the starting point of any utility vegetation management plan, including PacifiCorp's. PacifiCorp's vegetation management program to achieve clearances around electric lines and equipment includes four key components: (1) cycle trimming, (2) hazard tree removal, (3) remediation of at-risk species, and (4) removal of tall trees with path to strike electric lines and equipment. Therefore, this program includes other elements referenced in Section 5.3.5.15 and Section 5.3.5.16.</p> <p>Cycle Trimming: PacifiCorp has adopted a minimum clearance distance, at time of work, of at least twelve (12) feet for all distribution lines and at least twenty (20) feet for transmission lines under 115 kV and thirty (30) feet for any transmission lines of 115 kV or above. These minimum clearance distances are consistent with the recommendation in the Appendix E Guidelines of GO 95, Rule 35. These minimums are being used in existing work projects, and the next revision of the Standard Operating Procedures will reflect the same.</p> <p>In addition, PacifiCorp prunes vegetation beyond minimum required clearances in multiple ways. First, PacifiCorp uses increased clearance distances on distribution lines for certain species of trees, depending on tree growth rate. PacifiCorp separates vegetation into three categories: (a) slow growing; (b) moderate growing; and (c) fast growing. In all cases, PacifiCorp applies the minimum clearance of twelve (12) feet for slow growing species. In certain cases, PacifiCorp applies an increased clearance for moderate growing and fast growing species.</p> <p>Second, PacifiCorp integrates spatial concepts to distinguish between (i) side clearances, (ii) under clearances, and (iii) overhang clearances. Recognizing that certain trees grow vertically faster than other trees, it is appropriate to use an increased clearance when moderate or fast growing trees are under a conductor. Increasing overhang clearances also reduces the potential for faults due to overhang.</p> <p>Third, as a practical matter, PacifiCorp almost always prunes beyond the minimum required distances because of the physical structure of the tree. PacifiCorp uses natural target pruning for all prune work. Natural targets are the final pruning cut location at a strong point in a tree's disease defense system, which are branch collars and proper laterals. Pruning at natural targets protects the joining trunk or limb. This technique is drawn from ISA <i>Best Management</i></p>

Practices: Tree Pruning (Gilman and Lilly 2002) and *A300* (ANSI 2008). (See also Miller, Randall H., 1998. *Why Utilities "V-Out" Trees*. Arborist News. 7(2):9-16.)

Fourth, PacifiCorp uses forty (40) feet for minimum clearance after work on a 345 kV transmission line. This additional clearance is driven by heightened reliability concerns.

As part of existing efforts to mitigate the risk of wildfire, PacifiCorp has previously conducted targeted vegetation management projects in the HFTD. In essence, this has increased the frequency of work in particular areas, based on local conditions and growth rates. As a practical matter, increasing the frequency of work in particular areas typically results in clearances being maintained well in excess of those clearances required under GO 95, Table 1.

Correction work done in conjunction with off cycle inspections will address any outstanding clearance issues. Because of historic success in maintaining clearance requirements through its regular cycle maintenance programs, PacifiCorp does not anticipate that substantial additional clearance work will be required. Thus, no separate incremental costs for additional work to maintain clearance minimums are forecasted at this time and all costs associated with this effort have been captured and included in Table 25.

Hazard Tree Removal: PacifiCorp defines "hazard trees" as "dead, dying, diseased, deformed, or unstable trees which have a high probability of falling and contacting a substation, distribution or transmission conductors, structure, guys or other Company electric facility."

PacifiCorp's existing Standard Operating Procedures require the removal of hazard trees. Consistent with California law, removal is required when "dead, rotten or diseased trees or dead, rotten or diseased portions of otherwise healthy trees overhang or lean toward and may fall into a span of supply or communication lines." (GO 95, Rule 35; see also Public Resources Code § 4293 ("Dead trees, old decadent or rotten trees, trees weakened by decay or disease and trees or portions thereof that are leaning toward the line which may contact the line from the side or may fall on the line shall be felled, cut, or pruned so as to remove such hazard.")). Furthermore, the existing Standard Operating Procedures encourage removal even when removal is not required under GO 95, Rule 35 or PRC § 4293.

Hazard trees are identified through the inspections discussed in Sections 5.3.5.2 and 5.3.5.3 and by field crews performing work. To identify hazard trees, PacifiCorp uses the practices set forth in ANSI A300 (Part 9); Smiley, Matheny, and Lilly (2011), *Best Management Practices: Tree Risk Assessment*, International Society of Arboriculture; and CALFIRE Power Line Fire Prevention Field Guide §§ 12-19. In summary, PacifiCorp uses an initial Level 1 assessment, as defined in ANSI A300 (Part 9), with particular attention to the prevailing winds and trees on any uphill

slope. Suspect trees are subjected to a Level 2 assessment, as outlined in ANSI A300 (Part 9), to further assess their condition.

In many circumstances, obtaining property owner consent to removal is often part of the process. To accomplish removal when a property owner objects to removal, PacifiCorp goes to great lengths to obtain property owner permission, making repeated and reasoned requests by different representatives of the company.

Moving forward, in addition to existing practices, PacifiCorp plans to increase efforts to identify and remove hazard trees. As discussed in Section 5.3.5.6, PacifiCorp increased the frequency of its vegetation management inspections and implemented conducting an annual vegetation inspection on lines in the HFTD in 2019. More frequent inspections will necessarily improve the identification of hazard trees. Hazard trees identified during annual inspections will, of course, be removed or pruned sufficiently to eliminate the hazard (unless a property owner prevents such work). As a result, some hazard trees will be identified and removed earlier than under the existing program (i.e. which would have then occurred during the next regular cycle).

PacifiCorp plans to be more aggressive in generally reducing total inventory, thereby proactively removing more trees before such trees ever become hazard trees. While it would be unfeasible to remove all trees which have the potential to become hazard trees (i.e. by definition, all trees eventually become hazard trees when they die), PacifiCorp plans to remove a greater number of trees in the HFTD which have a higher potential of becoming a hazard tree.

Remediation of at-risk species: As discussed in the clearances section above, PacifiCorp distinguishes between slow growing, moderate growing, and fast growing species. Moderate growing and especially fast growing species present certain reliability and at-risk concerns. Accordingly, such species are subject to increased minimum clearance distances. In addition, removal of cycle buster trees, which are extremely fast growing species, is encouraged. As part of the new program for increased higher risk tree removal, as discussed above, PacifiCorp is targeting particular areas of high density vegetation for increased removal of non-compatible tree species that have a potential to encroach on facilities.

Removal of tall trees with path to strike electric lines and equipment: PacifiCorp does not limit inspections or tree assessments to a pre-determined distance (which would be, presumably, the defined width of a particular right-of-way easement). As discussed in the hazard tree section above, PacifiCorp's definition and assessment of hazard trees necessarily incorporates trees which are tall enough to fall into the right-of-way and strike a powerline. PacifiCorp does not conduct a Level 2 assessment on every tree tall enough to strike a powerline, because this would be unfeasible. Instead, PacifiCorp conducts a Level 1 assessment to identify trees tall enough to strike a powerline which

	may also be hazard trees; if such a tree is identified, PacifiCorp then conducts a Level 2 assessment to determine whether the tree is, in fact, a hazard tree subject to removal. Moreover, PacifiCorp will consider tree height as a factor in determining whether any particular tree is a candidate for preemptive removal.
Timeline to Minimize Risk [Planned/ Implemented]	Implemented
Rationale for Program	<p>When constructing an overhead line, PacifiCorp makes every effort to avoid building new lines over or through trees that currently need or will need to be cleared from the facilities in the future. This general approach reduces the volume of vegetation management activities required while also reducing general operational exposure and wildfire risk. Where PacifiCorp operates existing lines or where this vegetation cannot be avoided in order to properly serve customers and meet federal and state requirements, PacifiCorp leverages its Vegetation Management Standard Operating Procedures to ensure safe and reliable delivery of power. In the absence of such practices or programs, vegetation can lead to incidental contact and fault scenarios which, depending on the environmental conditions and presence of additional fuel, can lead to wildfire events.</p> <p>Therefore, maintaining safe clearances is the starting point of any utility vegetation management plan, including PacifiCorp's.</p>
Prioritization Approach	System wide with specific rules applied to the HFTD
Plan for audits/quality checks	See Section 5.3.5.13
Planned demonstration of effectiveness over time	Demonstrated effectiveness includes the identification of corrective work and maintenance of proper clearance, as identified through audits, and reduction in ignition potential by identifying and mitigating vegetation related conditions.
Planned Evaluation	General As with all of PacifiCorp's inspection programs, the company intends to implement these programs, pilot new technologies or methods where appropriate, and translate lessons learned or effectiveness into long term program modification and evolution. This same approach applies to the improvement of vegetation management activities.

	Before the upcoming wildfire season	No planned evolution
	Before the next annual update	<ul style="list-style-type: none"> • Pilot new electronic planning, mapping, and record keeping system with the HFTD. • Evaluate potential expansion of program scope. • Evaluate potential implementation of a program for increased higher risk tree removal and increased clearing of rights-of-way in the HFTD.
	Within the next 3 years	As PacifiCorp continues to implement its multi-year WMP, the company will continue to evaluate how inspections and programs may be improved by either changes to scope, tools, frequency, or correction timeframe. While PacifiCorp is early in the implementation of its multi-year WMP, PacifiCorp anticipates incorporating changes within the next three years. Additionally, as included in Section 5.3.5.6, PacifiCorp is beginning implementation of an electronic planning and tracking system to include specific GIS locations and detailed descriptions of required work as well as records of completed activities. PacifiCorp anticipates that this planning and tracking system will be fully implemented and incorporated in all facets of the company's vegetation management program within the next three years.
	Within the next 10 years	<p>Continued evolution of planning and tracking systems.</p> <p>Monitor of existing programs, pilot new technologies or methods where appropriate, and translate lessons learned or effectiveness into program modification and evolution.</p>

5.3.5.21 Other – Radial Pole Clearing

Program Name	Vegetation management and inspections
Initiative Name	Radial Pole Clearing (including incremental)
Description	<p>PacifiCorp vegetation management has expanded pole clearing to include 2,768 Local Responsibility Area (LRA) subject equipment poles located in the HFTD in addition to its existing program in compliance with regulations of clearing 12,292 State Responsibility Area (SRA) subject poles.</p> <p>Pole clearing involves the removal of all vegetation within a ten-foot radius cylinder of clear space around a subject pole and the application of herbicides and soil sterilants to prevent any vegetation regrowth (unless prohibited by law or the property owner). See image⁴⁶ included, nothing that the image is meant to describe a concept, not a specification and, therefore does not incorporate the ten foot radius included in PacifiCorp's program.</p> <p>This strategy is distinct from additional clearance and removal activities and requirements because it is not designed to prevent contact between vegetation and a power line. Instead, similar to "slash management", pole clearing is designed to reduce the risk of fire ignition if sparks are emitted from electrical equipment. PacifiCorp intends to implement pole clearing on wildland vegetation in the HFTD around poles which have fuses, air switches, clamps or other devices that could create sparks. After a pole has been cleared, a spark falling within the 10-foot radius would be much less likely to ignite a fire.</p>

⁴⁶ Illustration of pole-clearing requirements (California Department of Forestry & Fire Protection 2008, Figure 3, PRC 4292, 14 CCR 1254, Fire Break Clearance Requirement Around Poles and Towers

Timeline to Minimize Risk [Planned/ Implemented]		Implemented
Rationale for Program		<p>As described in Section 5.3.3.7, overhead equipment, under certain conditions, can create a spark. This potential spark, depending on the environmental conditions and the presence of fuel, has the potential to result in an ignition.</p> <p>In contrast to other programs, radial pole clearing is not designed to prevent contact between vegetation and a power line. Instead, similar to “slash management”, pole clearing is designed to reduce the risk of fire ignition if sparks are emitted from electrical equipment through elimination of the presence of fuel.</p> <p>While PacifiCorp views this as a stand-alone program, radial pole clearing also significantly mitigates the potential risk and impact of overhead expulsion fuses and other equipment within the HFTD until non-expulsion fuses can be installed as a part of the broader programs, as indicated in Section 5.3.3.7. Furthermore, this program aligns with the recommended by CALFIRE to remove vegetation from LRA poles in the HFTD.</p>
Prioritization Approach		Specifically targeting wildland vegetation in the HFTD around poles which have fuses, air switches, clamps or other devices that could create sparks.
Plan for audits/quality checks		Section 5.3.5.13
Planned demonstration of effectiveness over time		PacifiCorp views effectiveness of this program as removal of vegetation around the poles. PacifiCorp plans to ensure this effectiveness through an annually assessment of transmission lines or distribution feeders for any further vegetation growth on or around the poles.
Planned Evolution	General	As with all of PacifiCorp’s programs, the company intends to implement these processes, pilot new technologies or methods where appropriate, and translate lessons learned or effectiveness into program modification and evolution. Specific to radial pole clearing, this could include a change to tools, specifications and frequency, or both.
	Before the upcoming wildfire season	No planned evolution

	Before the next annual update	No planned evolution
	Within the next 3 years	As PacifiCorp is early in the implementation of its multi-year WMP, it is challenging to know specifically how and when programs may evolve and change. However, PacifiCorp anticipates the company's radial pole clearing program may begin incorporating new technology, specifications, or frequencies within the next three years.
	Within the next 10 years	Continued potential expansion of scope, change to frequency, or introduction of new tools.

The table below includes details regarding PacifiCorp's vegetation management and inspections wildfire mitigation programs. The 2019 WMP did not include specific annual requirements and, therefore, PacifiCorp only provided the total proposed program units and costs. Including any 2019 plan values for WMP programs contemplated in the company's 2019 WMP would be confusing and not helpful in understanding progress or the company's overall programs as these values reflect the total multi-year program proposals.

Table 25: Vegetation management and inspections

Initiative activity	Year	Line miles to be treated	Spend/treated line mile	Ignition probability drivers targeted	Risk reduction	risk-spend efficiency	Other risk drivers addressed	Existing/new	Existing: What proceeding has reviewed program	If new: Memorandum account	In/exceeding compliance with regulations	Cite associated rule	Comments
1. Additional efforts to manage community and environmental impacts	2019 plan	While collaboration such as this is critical to the overall wildfire risk reduction in the state of CA, PacifiCorp, at this time, does not have a specific program dedicated to this effort. Instead, these efforts are on an as-needed basis and incorporates additional efforts to manage community environments within other programs, such as those included in Section 5.3.9 and Section 5.3.10.											
	2019 actual												
	2020												
	2021												
	2022												
	2020-2022 plan total												
2. Detailed inspection of vegetation around distribution electric lines and equipment	2019 plan	N/A	N/A	Contact from object	N/A	N/A	Reduces escalation should an ignition event occur through removal of fuel	Existing	2018 GRC & 2019 WMP	N/A	In Compliance with Regulation	GO95	Program incorporated new requirements in 2019
	2019 actual	825	\$1,985										
	2020	825	\$1,725										
	2021	825	\$1,725										
	2022	825	\$1,725										
	2020-2022 plan total	2,475	\$1,725										
3. Detailed inspection of vegetation around transmission electric lines and equipment	2019 plan	N/A	N/A	Contact from object	N/A	N/A	Reduces escalation should an ignition event occur through removal of fuel	Existing	2018 GRC & 2019 WMP	N/A	In Compliance with Regulation	GO95	Program incorporated new requirements in 2019
	2019 actual	345	\$3,339										
	2020	345	\$2,098										
	2021	345	\$2,098										
	2022	345	\$2,098										
	2020-2022 plan total	1,035	\$2,098										

Initiative activity	year	Line miles to be treated	Spend/treated line mile	Ignition probability drivers targeted	Risk reduction	risk-spend efficiency	Other risk drivers addressed	Existing/new	Existing: What proceeding has reviewed program	If new: Memorandum account	In/exceeding compliance with regulations	Cite associated rule	Comments
4. Emergency response vegetation management due to red flag warning or other urgent conditions	2019 plan	As these vegetation management specific components are critical to the success of PacifiCorp’s emergency response programs and grid operations and protocols, the emergency response vegetation management due to red flag warning or other urgent conditions is a subset and component of both the company’s general emergency response plans and the company’s grid operations and protocols wildfire mitigation program focused on personnel work procedures and training conditions of elevation fire risk. Therefore, PacifiCorp does not at this time have a specific vegetation management and inspections wildfire mitigation program focused on Emergency response vegetation management due to red flag warning or other urgent conditions. See Section 5.3.6.3 and Section 5.3.9.											
	2019 actual												
	2020												
	2021												
	2022												
	2020-2022 plan total												
5. Fuel management and reduction of "slash: from vegetation management activities	2019 plan	While critical to the success of PacifiCorp’s overall vegetation management and inspections wildfire mitigation strategy, the Fuel management and reduction of “slash” from vegetation management activities are components of the company’s vegetation management to achieve clearances around electric lines and equipment. See Section 5.3.5.20.											
	2019 actual												
	2020												
	2021												
	2022												
	2020-2022 plan total												
6. Improvement of inspections	2019 plan	N/A - Elements already captured in other relevant programs	N/A - Elements already captured in other relevant programs	Contact from object	N/A	N/A	Reduces escalation should an ignition event occur through removal of fuel	Existing	2018 GRC & 2019 WMP	N/A	In Compliance with Regulation	GO95	Program incorporated new requirements in 2019
	2019 actual												
	2020												
	2021												
	2022												
	2020-2022 plan total												
7. LiDAR inspections of vegetation around distribution electric lines and equipment	2019 plan	PacifiCorp does not have a specific vegetation management and inspections wildfire mitigation program focused on LiDAR inspections of vegetation around distribution electric lines and equipment. Instead, PacifiCorp incorporates, as a component, LiDAR inspections of vegetation around distribution lines and equipment in its LiDAR inspections of distribution electric lines and equipment program. See Section 5.3.4.7.											
	2019 actual												
	2020												
	2021												
	2022												
	2020-2022 plan total												

Initiative activity	Year	Line miles to be treated	Spend/treated line mile	Ignition probability drivers targeted	Risk reduction	risk-spend efficiency	Other risk drivers addressed	Existing/new	Existing: What proceeding has reviewed program	If new: Memorandum account	In/exceeding compliance with regulations	Cite associated rule	Comments
8. LiDAR inspections of transmission electric lines and equipment	2019 plan	PacifiCorp does not have a specific vegetation management and inspections wildfire mitigation program focused on LiDAR inspections of vegetation around transmission electric lines and equipment. Instead, PacifiCorp incorporates, as a component, LiDAR inspections of vegetation around transmission lines and equipment in its LiDAR inspections of transmission electric lines and equipment program. See Section 5.3.4.8.											
	2019 actual												
	2020												
	2021												
	2022												
	2020-2022 plan total												
9. Other discretionary inspection of vegetation around distribution electric lines and equipment, beyond inspections mandated by rules and regulations	2019 plan	At this time, PacifiCorp does not have any other discretionary inspection of vegetation around distribution electric lines and equipment, beyond inspections mandated by rules and regulations, and other described programs.											
	2019 actual												
	2020												
	2021												
	2022												
	2020-2022 plan total												
10. Other discretionary inspection of vegetation around transmission electric lines and equipment, beyond inspections mandated by rules and regulations	2019 plan	At this time, PacifiCorp does not have any other discretionary inspection of vegetation around transmission electric lines and equipment, beyond inspections mandated by rules and regulations, and other described programs.											
	2019 actual												
	2020												
	2021												
	2022												
	2020-2022 plan total												
11. Patrol inspections of vegetation around transmission electric lines and equipment	2019 plan	PacifiCorp's description of patrol inspections of vegetation around distribution electric lines and equipment is included in the company's description of detailed inspections of vegetation around distribution lines and equipment. See Section 5.3.5.2											
	2019 actual												
	2020												
	2021												
	2022												
	2020-2022 plan total												

Initiative activity	Year	Line miles to be treated	Spend/treated line mile	Ignition probability drivers targeted	Risk reduction	risk-spend efficiency	Other risk drivers addressed	Existing/new	Existing: What proceeding has reviewed program	If new: Memorandum account	In/exceeding compliance with regulations	Cite associated rule	Comments
12. Patrol inspections of vegetation around transmission electric lines and equipment	2019 plan	PacifiCorp’s description of patrol inspections of vegetation around transmission electric lines and equipment is included in the company’s description of detailed inspections of vegetation around transmission lines and equipment. See Section 5.3.5.3											
	2019 actual												
	2020												
	2021												
	2022												
	2020-2022 plan total												
13. Quality assurance/ quality control of inspections	2019 plan	N/A - Elements already captured in other relevant programs	N/A - Elements already captured in other relevant programs	Contact from object	N/A	N/A	Reduces escalation should an ignition event occur through removal of fuel	Existing	N/A	N/A	N/A	N/A	General program and best practices applied to an accounted for in other relevant programs
	2019 actual												
	2020												
	2021												
	2022												
	2020-2022 plan total												
14. Recruiting and training of vegetation management personnel	2019 plan	PacifiCorp’s general approach to recruiting and training of vegetation management personnel can be found in chapter 1 of PacifiCorp Transmission and Distribution Vegetation Management Program Standard Operating Procedures manual. In general, PacifiCorp takes advantage of training that is provided by the company and arboriculture industry and issues materials and course as needed, such as a High Risk Tree Identification presentation created in 2019 to educate inspectors on proper identification of defective trees that have the potential to strike the facilities.											
	2019 actual												
	2020												
	2021	However, At this time, PacifiCorp does not have a vegetation management and inspections wildfire mitigation program focused on recruiting and training of vegetation management personnel.											
	2022												
	2020-2022 plan total												
15. Remediation of at-risk species	2019 plan	Remediation of at-risk species is a subset to its vegetation management to achieve clearances around electric lines and equipment program as it contains, as an element, the company’s practices procedures, and funding to remediate at-risk species. See Section 5.3.5.18.											
	2019 actual												
	2020												
	2021												
	2022												
	2020-2022 plan total												

Initiative activity	Year	Line miles to be treated	Spend/treated line mile	Ignition probability drivers targeted	Risk reduction	risk-spend efficiency	Other risk drivers addressed	Existing/new	Existing: What proceeding has reviewed program	If new: Memorandum account	In/exceeding compliance with regulations	Cite associated rule	Comments
16. Removal and remediation of trees with strike potential to electric lines and equipment	2019 plan	Removal and remediation of trees with strike potential to electric lines and equipment is a subset to the company's vegetation management to achieve clearances around electric lines and equipment program as it contains, as an element, the company's practices procedures, and funding to remove and remediate trees with strike potential to electric lines and equipment. See Section 5.3.5.18.											
	2019 actual												
	2020												
	2021												
	2022												
	2020-2022 plan total												
17. Substation vegetation inspections	2019 plan	PacifiCorp's vegetation detailed inspection and correction program included in Sections 5.3.5.2 and 5.3.5.3, discretionary inspection included in 5.3.5.9, and overall management activities to achieve proper clearances in Section 5.3.5.20, include work in and around substations. Therefore, PacifiCorp does not have a specific vegetation management and inspections program focused on substation inspection. See Sections 5.3.5.2, 5.3.5.3, 5.3.5.9, and 5.3.5.20.											
	2019 actual												
	2020												
	2021												
	2022												
	2020-2022 plan total												
18. Substation vegetation management	2019 plan	PacifiCorp's vegetation detailed inspection and correction program included in Sections 5.3.5.2 and 5.3.5.3, discretionary inspection included in 5.3.5.9, and overall management activities to achieve proper clearances in Section 5.3.5.20, include work in and around substations. Therefore, PacifiCorp does not have a specific vegetation management and inspections program focused on substation inspection. See Sections 5.3.5.2, 5.3.5.3, 5.3.5.9, and 5.3.5.20.											
	2019 actual												
	2020												
	2021												
	2022												
	2020-2022 plan total												
19. Vegetation inventory system	2019 plan	PacifiCorp recognizes the importance and value of creating and maintaining a vegetation inventory system. Such a system can help to assess risk, customize vegetation management programs, and optimize task assignment and execution. At this time, PacifiCorp does not have a defined vegetation inventory system program. However, the company is currently evaluating required steps, funding, and technology requirements to develop, implement, and incorporate a new tree density inventory system targeted initially within the HFTD to inform risk assessment and prioritization of efforts. PacifiCorp is prioritizing this task, intends to evaluate in 2019, and provide an update and further program details in the next annual update.											
	2019 actual												
	2020												
	2021												
	2022												
	2020-2022 plan total												

Initiative activity	Year	Line miles to be treated	Spend/treated line mile	Ignition probability drivers targeted	Risk reduction	risk-spend efficiency	Other risk drivers addressed	Existing/new	Existing: What proceeding has reviewed program	If new: Memorandum account	In/exceeding compliance with regulations	Cite associated rule	Comments
20. Vegetation management to achieve clearances around electric lines and equipment	2019 plan	N/A	N/A	Contact from object	N/A	N/A	Reduces escalation should an ignition event occur through removal of fuel	Existing	2018 GRC & 2019 WMP	N/A	In Compliance with Regulation	GO95	Program incorporated new requirements in 2019
	2019 actual	3,195	\$1,196										
	2020	3,195	\$1,029										
	2021	3,195	\$1,029										
	2022	3,195	\$1,029										
	2020-2022 plan total	9,585	\$1,029										
16. Other/not listed - Radial Pole Clearing	2019 plan	N/A	N/A	N/A	N/A	N/A	Reduces escalation should an ignition event occur through removal of fuel	Existing	2018 GRC & 2019 WMP	N/A	In Compliance with Regulation	GO95	Similar to substation inspections, units are reported on a per pole basis
	2019 actual	14,132	\$125										
	2020	15,060	\$118										
	2021	15,060	\$118										
	2022	15,060	\$118										
	2020-2022 plan total	45,180	\$118										

5.3.6 Grid operations and protocols

PacifiCorp interprets grid operations and protocols to include settings, procedures, strategies, and best practices leveraged to either operate and control the grid or respond to an event in a manner that mitigates wildfire risk. These programs range from disabling automatic reclosing on field reclosing devices to proactive staging of suppression equipment or resources through the company's service territory. The following subsections include the details of PacifiCorp's grid operations and protocols wildfire mitigation programs.

5.3.6.1 Automatic recloser operations

Program Name	Grid operations and protocols
Initiative Name	Automatic recloser operations
Description	<p>The manner in which an electrical system is operated can mitigate the wildfire risk. PacifiCorp has a specific policies to address system operations during fire season. This policy is designed to reduce the potential for ignition of a fire from sparks emitted when a line is re-energized despite a disturbance on the line. Recognizing the increasing magnitude of the wildfire risk, PacifiCorp's policies were significantly revised in June 2018 to incorporate more conservative procedures designed to reduce the potential of ignition because of a fault on PacifiCorp's electrical network. From a practical perspective, there are two primary subject areas addressed with these revision: (a) settings for automatic reclosers and (b) line testing after lock-out.</p> <p>Furthermore, implementing and continuously improving this program requires advanced investigation of fault events to understand the nature and type of faults and whether or not this program is properly mitigating these events.</p>
Timeline to Minimize Risk [Planned/ Implemented]	Implemented
Rationale for Program	Automatic reclosers are currently deployed on various transmission lines and distribution circuits throughout PacifiCorp's service territory. When a line trips open, an automatic recloser may operate to close the circuit very quickly, so long as the cause of a momentary trip has cleared. The reclosing function in an important feature as it allows PacifiCorp to maintain service on a line that had tripped, rather than opening the circuit and de-energizing the line. In general, automatic recloser operation is beneficial, because it reduces outages and improves customer reliability. The actual operation of recloser equipment does not directly present wildfire risk, as the recloser equipment itself does not emit sparks or otherwise pose an ignition risk.

	<p>The operation of automatic reclosers, however, indirectly implicates some degree of ignition risk. When a fault is detected on the line, a recloser will trip and reclose based on pre-determined settings in an attempt to re-energize the line. If the cause of the fault is no longer present when the device recloses, the line will re-energize resulting in limited impact to customers. If the cause of the original fault still remains when the device recloses, however, the original fault scenario will be experienced a second time and, depending on the circumstances, potentially result in arcing or an emission of sparks. As a result, in some limited circumstances, the second fault scenario could lead to a fire ignition. Accordingly, automatic recloser settings can have a significant impact on wildfire mitigation.</p> <p>The issue with line-testing is very similar. If a breaker has “locked-out” – meaning that it has opened and no longer conducts electricity – a system operator will sometimes “test” the line. To test the line, the system operator will close the device, thereby allowing the line to be re-energized. If the fault has cleared, then the system will run normally. If the fault has not cleared, the device will lock-out again. If the device locks again, the system operator then knows that additional investigation or work will be required before the line can be successfully re-energized. Because faults are often temporary, line-testing can be an efficient tool to maintain customer reliability. At the same time, line-testing can result in the emission of sparks if a fault has not yet cleared when the line is tested. Accordingly, a “no-test” policy reduces the risk of ignition, and a “no-test” policy is applicable in certain circumstances during fire season.</p> <p>Therefore, PacifiCorp has designed and developed its automatic reclosing operations wildfire mitigation program to include more restrictive system operating procedures during when wildfire conditions are more elevated to reduce this risk.</p>
Prioritization Approach	No prioritization necessary as this is implementation of a process/setting requirement.
Plan for audits/quality checks	<p>PacifiCorp’s program includes detailed investigation into fault events to include a deeper understanding of type and nature of faults experienced, which includes any faults experienced during fire season in CA. A result of this investigation not only yields identification of any mis-operations or near miss events but also corresponding changes and correction to the settings or approach to the program.</p> <p>Additional unwanted results or actions may be identified through the after action review process described in the company’s Emergency Response Plan and addressed in Section 5.3.9.</p>

Planned demonstration of effectiveness over time		Demonstration of effectiveness is a lack of unwanted reclosing operations on applicable equipment within the HFTD during fire season.
Planned Evolution	General	As with all of PacifiCorp's programs, the company intends to implement these processes, pilot new technologies or methods where appropriate, and translate lessons learned or effectiveness into program modification and evolution. Specific to the automatic recloser operations program, PacifiCorp anticipates evolution of this program to align with the company's implementation and evolution of system automation and grid design system hardening program included in Section 5.3.3.9.
	Before the upcoming wildfire season	No planned evolution at this time.
	Before the next annual update	No planned evolution at this time.
	Within the next 3 years	As PacifiCorp implements the company's grid design and system hardening program focused on the installation of system automation equipment, the company anticipates additional features and capabilities regarding the protection and control of PacifiCorp's distribution circuits may become available or possible. These advancements will most likely be focused on faster detection of a broader range of fault scenarios as well as quicker communication of events to other devices. While the specifics of this potential evolution remain unknown, PacifiCorp anticipates incorporating either lessons learned or advanced features identified through other programs into the company's automatic recloser operations program and policies within the next 3 years.
	Within the next 10 years	Continued implementation of new technologies or advancements.

5.3.6.2 Crew-accompanying ignition prevention and suppression resources and services

Program Name	Grid operations and protocols
Initiative Name	Crew-accompanying ignition prevention and suppression resources and services
Description	<p>PacifiCorp does not currently deploy crew-accompanying ignition prevention and suppression resources and services as part of its routine operational practices. When an emergency occurs, PacifiCorp communicates and collaborates with local emergency response teams as described in Section 5.3.9, which can include crew-accompanying ignition prevention and suppression resources and services. Additionally, during elevated risk conditions or during fire season, PacifiCorp leverages specific work practices and protocols and makes available specific resources and tools for use by operations personnel as included in Section 5.3.6.6. However, PacifiCorp does not currently have a specific grid operations and protocols wildfire mitigation program focused on crew-accompanying ignition prevention and suppression resources and services. As part of the annual WMP review process the use of these services will be re-evaluated and considered for future incorporation.</p>

5.3.6.3 Personnel work procedures and training conditions of elevation fire risk

Program Name	Grid operations and protocols
Initiative Name	Personnel work procedures and training conditions of elevation fire risk
Description	<p>PacifiCorp’s personnel work procedures and training conditions of elevation fire risk can be grouped into five main categories of (1) work restrictions, (2) work site preparation, (3) power equipment, (4) vehicles, and (5) outage restoration / re-energization protocols.</p> <p>1. Work Restrictions: PacifiCorp field operations are able to mitigate some wildfire risk by managing the way that field work is scheduled and performed. To effectively manage work during fire season, area managers regularly review local CALFIRE conditions and weather forecasts provided to them as part of PacifiCorp’s monitoring program discussed in the situational awareness section below.</p> <p><u>General Scheduling Restrictions.</u> Certain work restrictions already apply within heavily vegetated areas managed by the National Forest Service or Bureau of Land Management, and PacifiCorp plans to apply similar work restrictions in the HFTD. During fire season generally, field operations managers are encouraged to defer any non-essential work which is (i) in the HFTD and at a specific location with predominately wildland vegetation, and (ii) requires the use of power tools or has the potential that sparks will be emitted from electrical equipment. During periods in which a Red Flag Warning is published by the National Weather Service, field operations managers should not schedule such work unless immediately necessary to maintain reliable electric service, consistent with prudent utility practices.</p> <p><u>Hot Work Restrictions.</u> In the HFTD during fire season, field operations managers are encouraged to evaluate whether work should be performed during a planned interruption, rather than while a line energized.</p> <p><u>Time of Day Restrictions.</u> In the HFTD during fire season, field operations managers are encouraged to consider using alternate work hours to accommodate evening and night work, when there may be less risk of ignition.</p> <p><u>Wind Restrictions.</u> In the HFTD during fire season, Field Personnel are encouraged to defer work, if feasible, when there are windy conditions at a particular work site.</p> <p><u>Driving Restrictions.</u> In the HFTD during fire season, Field Personnel are encouraged to keep vehicles on designated roads whenever operationally feasible. In addition, field operations personnel should not park</p>

vehicles in areas where vegetation is more than 8 inches tall. If necessary, a parking site should be cleared, as part of the work-site preparation discussed below.

Activity Restrictions. Use of any incendiary device or any object which could emit sparks and ignite a fire, except the use of approved equipment necessary to complete a work function (i.e. use of power equipment, as discussed below), is prohibited when working in any area with wildland vegetation. Discharging a fire-arm or using fireworks at a work site is prohibited at all times. Smoking at a work site is generally discouraged, and smoking is especially discouraged when Field Personnel are working in an area with any amount of wildland vegetation; if smoking during a work break in the field, Field Personnel are required (i) to smoke in an area without dry grass underfoot; (ii) to ensure that all materials are extinguished after smoking; and (iii) to deposit all ash and other refuse resulting from the smoking activity in a fire-safe, metal container.

2. **Work-Site Preparation:** If wildland vegetation posing an ignition risk is prevalent at a worksite, and the work to be performed involves power tools or the potential emission of sparks from electrical equipment, Field Personnel working during fire season are encouraged to employ best practices and remove vegetation at the work site, especially when there is dry or tall wildland grass. In addition to clearing work, the water truck resources, discussed below, are strategically assigned to sometimes accompany Field Personnel working in the HFTD during fire season. Depending on local conditions, dry vegetation in the immediate vicinity may be sprayed with water prior to work as a preventative measure.
3. **Power Equipment.** Even when operated properly, certain power tools and equipment pose some ignition risk because of their potential to emit or cause a spark. Accordingly, field operations plans to sometimes use electric-powered alternatives or modified equipment which reduces the potential for sparks. Specifically, when performing work in HFTD areas during fire season, field operations will use chainsaws, generators, and weed-eaters which are powered with electric battery or equipped with spark arrestors. In addition, outside the HFTD, field operations personnel are encouraged to use such equipment when working in any wildland areas during the fire season. To make equipment available, field operations proposes to retrofit a sufficient quantity of existing equipment or purchase new equipment, so that each district with HFTD has equipment available. Long term, when purchasing new equipment generally, field operations plans to always purchase chainsaws, generators, and weed-eaters which are electric powered or equipped with spark arrestors.
4. **Vehicles:** Vehicles can be a source of ignition. As discussed above, field operations personnel are instructed to stay on designated roads during fire season, as feasible, and to avoid vegetation which could contact the

	<p>undercarriage of parked vehicle. To further mitigate any wildfire risk associated with the use of vehicles, field operations plan to convert, over time, the vehicle exhaust configuration of work trucks. To accomplish this objective, field operations will strategically convert some vehicles in districts with the greatest amount of HFTD. Long term, when new vehicles are purchased, PacifiCorp plans to purchase trucks with a vehicle exhaust configuration which minimizes ignition risk.</p> <p>5. Outage Restoration / Re-Energization Protocols: After a fault results in an outage or a PSPS event occurs, all or part of a circuit might remain de-energized while either restoration work is performed or until high risk conditions change, depending on the design, loading conditions, and sectionalizing capability of the circuit. In some cases, additional foreign objects, such as tree limbs or other debris, can come into contact with the de-energized line and remain undetected throughout the duration of the PSPS event or restoration efforts. To mitigate the risk of re-energizing the line with additional foreign objects on the line, field operations may perform a line patrol on certain de-energized sections of the circuit depending on local conditions. Typically, this type of line patrol does not involve a close inspection of any particular facility; instead, it is a quick visual assessment specifically targeted to identify obvious foreign objects which may have fallen into the line during restoration work or PSPS event.</p>
Timeline to Minimize Risk [Planned/ Implemented]	Implemented
Rationale for Program	<p>During fire season, PacifiCorp modifies operations procedures, under certain circumstances, to further mitigate wildfire risk. In particular, there are operations procedures applicable when weather conditions create an elevated risk of wildfire and other operations procedures applicable in geographic areas of elevated wildfire risk. These procedures are targeted to reduce the potential of direct or indirect causes of ignition during planned activities, fault response, and outage restoration.</p> <p>In general, these programs focus on the elimination of potential ignitions due to the use of traditionally accepted operational practices or equipment that, under certain circumstances such as elevated wildfire risk, can result in an ignition. Additionally, these programs aim to reduce the presence of available fuel or escalation of an existing event.</p>
Prioritization Approach	Amendments to operational practices, procedures, and tools are prioritized within the HFTD.

Plan for audits/quality checks		<p>PacifiCorp has a goal of continuous incident management improvement which includes, as a component, the disaster and emergency preparedness plan and operational practices and procedures. PacifiCorp evaluates exercises and actual response incidents, by identifying issues raised during the exercise or incident and documenting lessons learned and corrective action plans. Multiple methods are used to gather exercise and post-action reviews, including participant and observer evaluation forms, remedial action tracking, and post-exercise or after-action incident reviews. Lessons learned may be implemented for inclusion in PacifiCorp's response and restoration procedures and incorporated in the emergency response document.</p> <p>This review process which is imbedded in the company's Emergency Response Plan, does include work performed by operations personnel and would, inherently identify any deficiencies included in this program. Instead of designing a separate QA/QC process, PacifiCorp' intends to leverage the company's existing QA/QC process including after action reviews, correction of deficiencies, and incorporation of lessons learned. See Section 5.3.9 for more information.</p> <p>Additionally, PacifiCorp conducts an annual wildfire preparedness check for districts that operate within the HFTD. This includes an inventory of equipment, vehicles, and refresher training for employees on operational practices. The results from these checks inform the quality of preparedness before entering fire season and inform the on-going program.</p>
Planned demonstration of effectiveness over time		Demonstrated effectiveness of this program is generally downtown trend regarding utility caused ignitions within the HFTD of PacifiCorp's service territory during fire season.
Planned Evolution	General	<p>As with all of PacifiCorp's programs, the company intends to implement these processes, pilot new technologies or methods where appropriate, and translate lessons learned or effectiveness into program modification and evolution. Specific to personnel work procedures and training, this could incorporate the use of different tools, further abbreviation of work schedules or allowed scope during fire season, or enhancement to restoration outage protocols.</p> <p>As PacifiCorp is early in the implementation of its multi-year WMP, it is challenging to know specifically how and when the company's grid operations and protocols programs will evolve. However, PacifiCorp anticipates that evolution in the form of changes to processes or available tools is most likely to occur within the next three years.</p>
	Before the upcoming wildfire season	No planned evaluation at this time.

	Before the next annual update	No planned evaluation at this time.
	Within the next 3 years	PacifiCorp anticipates that evolution in the form of changes to processes or available tools is most likely to occur within the next three years.
	Within the next 10 years	Continued expansion of evolution.

5.3.6.4 Protocols for PSPS re-energization

Program Name	Grid operations and protocols
Initiative Name	Protocols for PSPS re-energization
Description	PacifiCorp considers re-energization after a PSPS event to be a subset of outage restoration / re-energization protocols included in Section 5.3.6.3. Therefore, PacifiCorp does not have a separate protocol for PSPS.

5.3.6.5 PPS events and mitigation of PPS impacts

Program Name	Grid operations and protocols
Initiative Name	PPS events and mitigation of PPS impacts
Description	<p>The purpose of a PPS is to limit the potential for overhead utility equipment creating an ignition source which could catastrophically impact communities. The implementation of a PPS event, as it applied to wildfire mitigation, is focused on extreme elevated risk conditions and applies to a specific subset of PacifiCorp's service territory. Details regarding PacifiCorp's PPS plans, including the regulatory requirements of proactive de-energization, the methodology applied to identify candidate de-energization zones, the potential impact to customers and communities, triggers for activation, subsequent communications and protocols, as well as lessons learned from 2019 and planned evolution of the program can be found in Section 4.4.</p> <p>Furthermore, PacifiCorp's protocols on PPS events, including the company's strategy to minimum the public safety risk during high wildfire risk conditions as it applies to the implementation of a PPS event, can be found in Section 5.6.2.</p> <p>At this time, PacifiCorp does not have an additional grid operations and protocols wildfire mitigation program not already included and discussed in Section 4.4 and Section 5.6.2.</p>

5.3.6.6 Stationed and on-call ignition prevention and suppression resources and services

Program Name	Grid operations and protocols
Initiative Name	Stationed and on-call ignition prevention and suppression resources and services
Description	<p>PacifiCorp's stationed and on-call ignition prevention and suppression resources and services wildfire mitigation program includes two basic elements: (1) personal suppression equipment and (2) water truck resources.</p> <ol style="list-style-type: none"> 1. Basic Personal Suppression Equipment: Personal safety is the first priority, and PacifiCorp Field Personnel are encouraged to evacuate and call 911 if necessary. Field Personnel working in the HFTD maintain the capability to extinguish a small fire which ignited while field personnel were working in the field. Field personnel should attempt suppression only if the fire is small enough so that one person can effectively fight the fire while maintaining their personal safety. All field personnel working in the HFTD during fire season will have basic suppression equipment available onsite, with field utility trucks will carrying the following equipment: (1) Fire Extinguisher; (2) Shovel; (3) Pulaski; (4) Water Container; and (5) Dust Mask. The water container should hold at least five gallons and may be a pressurized container or a backpack with a manual pump (or other approved container). Short term, these five items are required on any trucks performing work in the HFTD during fire season. Long term and to eliminate any administrative confusion, PacifiCorp plans to make such equipment standard on all trucks used for field work. Existing stocks of fire extinguishers rated ABC-5 pound minimum shall satisfy the requirement. New fire extinguishers, however, will be rated ABC-10 pound minimum, and area managers are encouraged to have any trucks frequently working in wildland areas equipped with fire extinguishers rated ABC-10 pound minimum. 2. Water Truck Resources: PacifiCorp also maintains additional equipment which may be used to respond to small ignitions. To be clear, these resources are not dispatched to reported fires (i.e. like a fire truck). Instead, PacifiCorp resources are strategically assigned to accompany field personnel if conditions warrant. For example, if it is necessary to perform work in the HFTD during a period in which there is a Red Flag Warning, PacifiCorp field operations may schedule a water truck to join field personnel working in the field. As discussed above, the water truck can be used to help prep the site for work. And in the extremely unlikely event there was an ignition, the water truck could be used to assist in the suppression of a small fire.

Timeline to Minimize Risk [Planned/ Implemented]		Implemented
Rationale for Program		Equipping field personnel and strategically locating suppression tools and resources can provide PacifiCorp with a strategic advantage to stop the growth of a spark or fire into a wildfire event. While not common, this program requires limited investment and is fairly simple to implement as compared to other wildfire mitigation programs.
Prioritization Approach		Prioritize implementation for field personnel or operations areas working in Tier 3 and Tier 2.
Plan for audits/quality checks		PacifiCorp performs an annual verification of available equipment as part of its overall fire season preparation. As a part of this exercise, local operations managers identify any deficiencies in required equipment, and take steps to close these gaps ensuring that these programs continue to be implemented year after year.
Planned demonstration of effectiveness over time		Demonstration of effectiveness of this program is the availability of these resources during an emergency event. This aspect is included in the overall after action review processes and requirements included in the company's emergency response programs in Section 5.3.9.
Planned Evolution	General	As with all of PacifiCorp's programs, the company intends to implement these processes, pilot new technologies or methods where appropriate, and translate lessons learned or effectiveness into program modification and evolution. Specific to stationed and on-call ignition prevention and suppression resources and services, this could incorporate the use of different tools, number of resources, or application of these resources. As PacifiCorp is early in the implementation of its multi-year WMP, it is challenging to know specifically how and when the company's grid operations and protocols programs will evolve. However, PacifiCorp anticipates that evolution in the form of changes to processes or available tools is most likely to occur within the next three years.
	Before the upcoming wildfire season	No planned evaluation at this time.
	Before the next annual update	No planned evaluation at this time.

	Within the next 3 years	PacifiCorp anticipates that evolution in the form of changes to processes or available tools is most likely to occur within the next three years.
	Within the next 10 years	Continued expansion of evolution.

5.3.6.7 Other not listed [only if an initiative cannot feasibly be classified within those listed above]

Program Name	Grid operations and protocols
Initiative Name	Other not listed [only if an initiative cannot feasibly be classified within those listed above]
Description	At this time, PacifiCorp does not have any additional grid operations and protocols wildfire mitigation programs.

The following table includes details regarding PacifiCorp's grid operations and protocols wildfire mitigation programs. PacifiCorp, where appropriate, mapped the 2019 WMP values to the most applicable program below. It is important note that spend associated with these programs are event-based. Therefore, PacifiCorp will continue to include applicable dollars in the company's planned dollars but it is expected that the use of these dollars will vary significantly and often be zero, such as the values reported in 2019 actuals. Additionally, the 2019 WMP did not include specific annual requirements and, therefore, PacifiCorp only provided the total proposed program units and costs. Including any 2019 plan values for WMP programs contemplated in the company's 2019 WMP would be confusing and not helpful in understanding progress or the company's overall programs as these values reflect the total multi-year program proposals.

Table 26: Grid operations and protocols

Initiative activity	year	Line miles to be treated	Spend/treated line mile	Ignition probability drivers targeted	Risk reduction	risk-spend efficiency	Other risk drivers addressed	Existing/new	Existing: What proceeding has reviewed program	If new: Memorandum account	In/exceeding compliance with regulations	Cite associated rule	Comments
1. Automatic recloser operations	2019 plan	N/A	N/A	All - Regardless of the cause, this program reduces that potential that a fault scenario results in an ignition event	N/A	N/A	Reduces escalation should an ignition event occur through removal of subsequent fault event	New in 2019	N/A	2019 WMP Memorandum Account	Non-standard operating practice	N/A	Program is applicable to all HFTD OH lines
	2019 actual	1,200	\$0										
	2020	1,200	\$500										
	2021	1,200	\$500										
	2022	1,200	\$500										
	2020-2022 plan total	3,600	\$500										
2. Crew-accompanying ignition prevention and suppression resources and services	2019 plan	PacifiCorp does not currently deploy crew-accompanying ignition prevention and suppression resources and services as part of its routine operational practices. When an emergency occurs, PacifiCorp communicates and collaborates with local emergency response teams as described in Section 5.3.9, which can include crew-accompanying ignition prevention and suppression resources and services. Additionally, during elevated risk conditions or during fire season, PacifiCorp leverages specific work practices and protocols and makes available specific resources and tools for use by operations personnel as included in Section 5.3.6.6. However, PacifiCorp does not currently have a specific grid operations and protocols wildfire mitigation program focused on crew-accompanying ignition prevention and suppression resources and services. As part of the annual WMP review process the use of these services will be re-evaluated and considered for future incorporation.											
	2019 actual												
	2020												
	2021												
	2022												
	2020-2022 plan total												

Initiative activity	year	Line miles to be treated	Spend/treated line mile	Ignition probability drivers targeted	Risk reduction	risk-spend efficiency	Other risk drivers addressed	Existing/new	Existing: What proceeding has reviewed program	If new: Memorandum account	In/exceeding compliance with regulations	Cite associated rule	Comments
3. Personnel work procedures and training in conditions of elevated risk	2019 plan	N/A	N/A	Equipment related ignition	N/A	N/A	Reduces escalation should an ignition event occur through removal of subsequent fault event	New in 2019	N/A	2019 WMP Memorandum Account	Non-standard operating practice	N/A	Program is applicable to all HFTD OH lines
	2019 actual	1,200	\$0										
	2020	1,200	\$917										
	2021	1,200	\$917										
	2022	1,200	\$917										
	2020-2022 plan total	3,600	\$917										
4. Protocols for PSPS re-energization	2019 plan	PacifiCorp considers re-energization after a PSPS event to be a subset of outage restoration / re-energization protocols included in Section 5.3.6.3. Therefore, PacifiCorp does not have a separate protocol for PSPS.											
	2019 actual												
	2020												
	2021												
	2022												
	2020-2022 plan total												
5. PSPS events and mitigation of PSPS impacts	2019 plan	At this time, PacifiCorp does not have an additional grid operations and protocols wildfire mitigation program not already included and discussed in Section 4.4 and Section 5.6.2.											
	2019 actual												
	2020												
	2021												
	2022												
	2020-2022 plan total												
6. Stationed and on-call ignition prevention and suppression resources and services	2019 plan	N/A	N/A	N/A	N/A	N/A	Reduces escalation should an ignition event occur	New in 2019	N/A	2019 WMP Memorandum Account	Non-standard operating practice	N/A	Program is applicable to all HFTD OH lines
	2019 actual	1,200	\$250										
	2020	1,200	\$250										
	2021	1,200	\$250										
	2022	1,200	\$250										
	2020-2022 plan total	3,600	\$250										

Initiative activity	Year	Line miles to be treated	Spend/treated line mile	Ignition probability drivers targeted	Risk reduction	risk-spend efficiency	Other risk drivers addressed	Existing/new	Existing: What proceeding has reviewed program	If new: Memorandum account	In/exceeding compliance with regulations	Cite associated rule	Comments
7.Other/not listen [only is an initiative cannot feasibly be classified within those listen above]	2019 plan	At this time, PacifiCorp does not have any additional grid operations and protocols wildfire mitigation programs.											
	2019 actual												
	2020												
	2021												
	2022												
	2020-2022 plan total												

5.3.7 Data governance

PacifiCorp has leveraged existing data sources to produce metrics supporting its WMPs, some of which are its data sources while others may be external data sources. In a small number of situations that required the development of new databases (such as in the 2019 Decision approving the SMJU WMPs relating to Fire Incident Data Collection Reporting) the company has structured the new applications to be fed from existing sources (to the extent possible). The core data relates to outage data, which is collected and categorized consistent with IEEE 1366 & IEEE 1782 as well as Commission Decisions D.96-09-045 and D.16-01-008, while circuit equipment is derivative of the company's Geographic Information System. In keeping with the approach of leveraging existing repositories, the newly installed weather stations feed data in the University of Utah's Department of Atmospheric Science's Mesowest application, treating this resource as the repository for weather information from these and other weather stations. Additionally, the 2020 WMP is reliant upon other external data sources, such as the National Weather Service's Red Flag Warnings (as accessible through <https://mesonet.agron.iastate.edu/info/data/sets/vtec.html>) features of elevated fire weather. If these external data sources alter process it could result in modifications in this correlating data, to which the company and other stakeholders need to be attentive.

5.3.7.1 Centralized repository for data

Program Name	Data governance
Initiative Name	Centralized repository for data
Description	Thorough and accurate data is required to ensure decisions made based upon that data can be repetitively and consistently evaluated to achieve the same conclusions through time. To the extent that data that underpins these decisions is highly subjective and has substantial uncertainty associated with it, repetition and consistent conclusions are not likely to occur. Data systems leveraged include outage and circuit topology (which are company repositories) in addition to weather, which is housed through the University of Utah's Mesowest.
Timeline to Minimize Risk [Planned/ Implemented]	Implemented
Rationale for Program	Accurate and reliable data is critical for analysis; repeatable queries on this data will allow for consistent analysis and persistent long-term strategies to be adopted through the WMPs.

Prioritization Approach		Data is prioritized most highly if it is core to the business processes, such as those associated with outage response, crew processes and facility information (such as outage data), as well as that which the company is directed to complete through regulation or statute (such as fire incident data). The next priority of data relates to that which is foundational to decisions that are developed responsive to business process or regulation, thus supporting the accomplishment of key initiatives (such as weather data underpinning risk analysis).
Plan for audits/quality checks		Outage data is quality checked as it is completed by assigned internal personnel. Fire incident data is quality checked by peer review (cross-department verification)
Planned demonstration of effectiveness over time		The effectiveness of the data collection processes the company's established are expected to be demonstrated by the ability to correctly and consistently supply key data as outlined through its 2020 WMP submission.
Planned Evolution	General	As the company discovers that its risk and prioritization methods are better served by additional targeted data it will augment the legacy data sources and attempt to retrospectively correlate any critical information, however, more probably the majority of additional detail will be prospectively available. Thus, early conclusions may be discovered to be better supported through these additional details.
	Before the upcoming wildfire season	No specific deliverables on this initiative are planned prior to the upcoming wildfire season.
	Before the next annual update	Develop methods to ensure programmatic associations among data sources; evaluate frequent refresh cycle for assessment on interim performance as compared to these data sources (i.e. outages and weather, ignitions and fire weather warnings, etc.)
	Within the next 3 years	Refresh data and ensure programmatic associations among data sources; evaluate and implement frequent refresh cycle for assessment on interim performance as compared to these data sources.
	Within the next 10 years	Refresh data and ensure programmatic associations among data sources; evaluate and implement frequent refresh cycle for assessment on interim performance as compared to these data sources.

5.3.7.2 Collaborative research on utility ignition and/or wildfire

Program Name	Data governance
Initiative Name	Collaborative research on utility ignition and/or wildfire
Description	Collaborate with industry and academia to explore methods to quantify utility ignition risk, wildfire risk from utility ignitions and other phenomenon that are at the intersection of fire/utility/weather.
Timeline to Minimize Risk [Planned/ Implemented]	Planned and Implemented
Rationale for Program	Wildfire risk especially that related to utility ignitions, is a newly-emerging cross-technical area of expertise. The development of the California Fire Threat Map product in 2018 (that comprised several years of analysis and mapping/computational efforts) demonstrated the need for collaboration and structured assessment amongst the various technical specialties. Such efforts need to continue to be explored to ensure that best possible outcomes emerge, notably electrical system configuration and operational approaches will result in a broader range of possible variables that need to be appraised in identifying best practices.
Prioritization Approach	PacifiCorp will prioritize collaboration where it is able to fill in gaps not filled by other parties, given its unique position as a company which operates across six western states, with sister companies in additional states. Further, it has substantial experience in certain program areas and where those areas of expertise can more broadly support widespread benefit it will engage as such.
Plan for audits/quality checks	As opportunities become available PacifiCorp will review materials in a peer environment to model after academic processes. Further, it will support collaboration on an as-requested basis, recognizing the priorities outlined above.
Planned demonstration of effectiveness over time	As efforts are found beneficial they should be evidenced by PacifiCorp's performance against Tables 2,3,10 and 11. More broadly however, the aggregation of all utilities should demonstrate improved performance against these metrics. Finally, further models or other analytical products would evidence effectiveness of this approach.
Planned Evaluation	General PacifiCorp was an active participant in the development of the California Fire Threat Map. The involvement led to better map products for the state while it also resulted in better and quicker adoption of the product (and other regulations) into PacifiCorp's operating environment. This experience led to expansion into the other states the

		company serves as well as within its sister companies held by Berkshire Hathaway Energies, who further bench-tested the analytical approaches and mitigation measures devised.
	Before the upcoming wildfire season	PacifiCorp is currently involved in EEI collaboration with DOE regarding wildfire grid hardening and serves in a sponsor role for an upcoming Wildfire Technology Summit. It is also sharing WMP analysis and mitigation measures 2019 plans and actions through industry meetings such as with the IEEE Distribution Reliability Working Group.
	Before the next annual update	Continued involvement with the California Energy Commission's Next Gen Wildfire Modeling Project as a Technical Advisory Committee member.
	Within the next 3 years	Specific deliverables have not yet been defined, however as the scientific process proceeds it is expected that these interim deliverables will be introduced into the company's WMP.
	Within the next 10 years	Specific deliverables have not yet been defined, however as the scientific process proceeds it is expected that these interim deliverables will be introduced into the company's WMP.

5.3.7.3 Documentation and disclosure of wildfire-related data and algorithms

Program Name		Data governance
Initiative Name		Documentation and disclosure of wildfire-related data and algorithms
Description		Wildfire related data and algorithms are key elements in evaluating mitigation approaches and implementing those found to be the most effective. As external conditions continue to evolve, better vetted approaches will produce improved outcomes for stakeholders at least cost.
Timeline to Minimize Risk [Planned/ Implemented]		Implemented and Planned
Rationale for Program		Peer review of considered and adopted algorithms related to wildfire and utility operations will introduce opportunities for improvements of these approaches and adoption by others for whom such algorithms may advance their approaches toward wildfire mitigation.
Prioritization Approach		PacifiCorp considers data that drives PSPS decisions to be the highest priority, followed by data supportive of optimization of mitigation approaches, particularly those which are particularly costly.
Plan for audits/quality checks		As outlined previously, PacifiCorp has attempted to be transparent as to the influencers for PSPS and asset hardening approaches and expects to continue this approach. It will explore opportunities to engage parties who may have specific insight into aspects of the data which the company may not be familiar with.
Planned demonstration of effectiveness over time		It is expected that outcomes such as those evidenced in Tables 2, 3, 4, 10 and 11 will provide insight into the effectiveness of the measures.
Planned Evaluation	General	PacifiCorp has provided transparency into its rationale during the filing and review process of its 2019 WMP. Further, during the establishment of its PSPS plans it outlined its foundational analysis to Public Safety Partners, including weather professionals and fire scientists. Concurrently PacifiCorp is participating in the active Proactive De-energization proceeding and will incorporate guidance established during that process into any relevant algorithms or risk quantification.

	Before the upcoming wildfire season	PacifiCorp intends to re-evaluate its PSPS triggers and determine the need for modifying the combination of KBDI, FFWI6 and wind gusts and explore whether a lower KBDI threshold should be considered that would likely be associated with a higher FFWI6 and wind gust. These products will again be reviewed by interested Public Safety Professionals, fire scientists and weather professionals.
	Before the next annual update	PacifiCorp anticipates continued assessment of PSPS thresholds, particularly after is has an additional fire season to complement its most recent fire season experience. Any approaches found particularly useful by stakeholders, regulators or other interested parties will be communicated.
	Within the next 3 years	PacifiCorp anticipates continued assessment of PSPS thresholds, particularly after is has additional fire seasons to review. Any approaches found particularly useful by stakeholders, regulators or other interested parties will be communicated.
	Within the next 10 years	PacifiCorp anticipates continued assessment of PSPS thresholds, particularly after is has additional fire seasons to review. Any approaches found particularly useful by stakeholders, regulators or other interested parties will be communicated.

5.3.7.4 Tracking and analysis of near miss data

Program Name	Data governance
Initiative Name	Tracking and analysis of near miss data
Description	Near miss data may provide opportunities to evaluate conditions not conducive to ignition, which could help identify specific conditions, locations, topological or other specifics that are lower probability of ignition, while enabling the corollary conditions (i.e. actual ignitions) to be further analyzed.
Timeline to Minimize Risk [Planned/ Implemented]	Implemented
Rationale for Program	In PacifiCorp's 2019 WMP it proposed effectiveness measures that might be considered to be near miss data sources, specifically fault events (from its outage reporting system), fault events where fire was involved and ignition events. Those fault events which do not lead to ignition offer insight into environmental, operational and conditional information which might better inform future actions to mitigate utility-caused ignitions.
Prioritization Approach	Data prioritization will be targeted toward continuing to broadly categorize outage data as completely as possible using the proposed methods in the company's proposed effectiveness metrics in addition to continuing to explore the newly established ignition probability drivers developed for the 2020 WMP.
Plan for audits/quality checks	PacifiCorp has internally reviewed its proposed metrics, the relationships creating the ignition probability drivers and will be producing its fire incident data report, all of which can be made available for quality review. As the company analyzes this data it will discover opportunities for improving data quality which it will cycle into the data sets.
Planned demonstration of effectiveness over time	Assessment of near miss trends will demonstrate the effectiveness of programs adopted through the WMP, which are expected to be further evidenced through Tables 2, 3, 10 and 11.

Planned Evolution	General	PacifiCorp outlined its approach to assessing near miss analysis with the graphic depicted in Figure 1 in Section 3; to the extent that the fault events, ignitions and overlaps change these variations will support assessment of the variations. If however, variations in underlying tracking systems supporting this analysis occur, incorrect conclusions could result.
	Before the upcoming wildfire season	Review opportunities for further data quality improvements associated with data mapping of fault and ignition probability drivers, including components involved.
	Before the next annual update	Prepare refresh analysis of fault events, ignition probability drivers and involved components.
	Within the next 3 years	Prepare refresh analysis of fault events, ignition probability drivers and involved components; incorporate findings into risk analysis framework as appropriate for any regulatory requirements associated with risk based modeling systems.
	Within the next 10 years	Prepare refresh analysis of fault events, ignition probability drivers and involved components; incorporate findings into risk analysis framework as appropriate for any regulatory requirements associated with risk based modeling systems.

5.3.7.5 Other / not listed [only if an initiative cannot feasibly be classified within those listed above]

Program Name	Data governance
Initiative Name	Other / not listed [only if an initiative cannot feasibly be classified within those listed above]
Description	PacifiCorp does not have any other data governance wildfire mitigation programs at this time.

The following table includes details regarding PacifiCorp's data governance as it applies to the company's wildfire mitigation programs. The 2019 WMP did not include specific annual requirements and, therefore, PacifiCorp only provided the total proposed program units and costs. Including any 2019 plan values for WMP programs contemplated in the company's 2019 WMP would be confusing and not helpful in understanding progress or the company's overall programs as these values reflect the total multi-year program proposals.

Table 27: Data governance

Initiative activity	year	Line miles to be treated	Spend/treated line mile	Ignition probability drivers targeted	Risk reduction	risk-spend efficiency	Other risk drivers addressed	Existing/new	Existing: What proceeding has reviewed program	Memorandum account	In/exceeding compliance with regulations	Cite associated rule	Comments
1. Centralized repository for data	2019 plan	PacifiCorp, at this time, does not have a specific data governance wildfire mitigation program focused on a centralized repository for data that maps to the tracking and level of details requested in this table. Additional details regarding PacifiCorp's plan and approach are included in Section 5.3.7.1.											
	2019 actual												
	2020												
	2021												
	2022												
	2020-2022 plan total												
2. Collaborative research on utility ignition and/or wildfire	2019 plan	PacifiCorp, at this time, does not have a specific data governance wildfire mitigation program focused on a collaborative research on utility ignition and/or wildfire that maps to the tracking and level of details requested in this table. Additional details regarding PacifiCorp's plan and approach are included in Section 5.3.7.2.											
	2019 actual												
	2020												
	2021												
	2022												
	2020-2022 plan total												
3. Documentation and disclosure of wildfire-related data and algorithms	2019 plan	PacifiCorp, at this time, does not have a specific data governance wildfire mitigation program focused on a documentation and disclosure of wildfire-related data and algorithms that maps to the tracking and level of details requested in this table. Additional details regarding PacifiCorp's plan and approach are included in Section 5.3.7.3.											
	2019 actual												
	2020												
	2021												
	2022												
	2020-2022 plan total												

	2020-2022 plan total	
4. Tracking and analysis of near miss data	2019 plan	PacifiCorp, at this time, does not have a specific data governance wildfire mitigation program focused on the tracking and analysis of near miss data that maps to the tracking and level of details requested in this table. Additional details regarding PacifiCorp's plan and approach are included in Section 5.3.7.4.
	2019 actual	
	2020	
	2021	
	2022	
	2020-2022 plan total	
5. Other/not listen [only is an initiative cannot feasibly be classified within those listen above]	2019 plan	PacifiCorp does not have any other data governance other wildfire mitigation programs.
	2019 actual	
	2020	
	2021	
	2022	
	2020-2022 plan total	

5.3.8 *Resource allocation methodology*

At this time, PacifiCorp does not have a resource allocation methodology development and application program specifically focused on wildfire mitigation. Instead, PacifiCorp takes a more general approach, weighs the available resources, evaluates long lead timelines to procure materials, and overall wildfire risk associated with a geographic area to prioritize work and allocate resources. Compliance based activities take first priority while others are prioritized based on geographic wildfire Tier (Tier 2 vs Tier 3) and overall availability of materials. As opposed to prioritizing a certain type of program, PacifiCorp prioritizes the location of work to be completed and groups all potential program aspects applicable at that location into projects. This ensures that all programs on an applicable circuit, line, or combination of circuits and lines are completed at the same time to make efficient use of resources and avoid working in the same location multiple times. Where a wildfire mitigation program requires capital funding and construction, PacifiCorp established a Wildfire Project Management Office in 2020 with a dedicated Wildfire Mitigation Delivery Director responsible for managing resources and execution of programs.

As previously described in Section 5.3 under the S-MAP and RAMP process for small and multijurisdictional utilities subheading, PacifiCorp, as a small and multijurisdictional utility, complies with the adopted methodology per D.19-04-020 regarding the company's S-MAP and RAMP process. As is expected with small and multijurisdictional utilities per D.19-04-020, PacifiCorp has adhered to the 10 RAMP Elements in the Company's GRC testimony but still remains in the early stages of the S-MAP and RAMP process.

Many of the elements requested in this 2020 WMP filing may not be applicable to PacifiCorp, specifically many of the components requested in this section. At the guidance of the Wildfire Safety Division of the California Public Utilities Commission,⁴⁷ these elements are marked "does not apply" or "not applicable" throughout the company's filing. However, PacifiCorp fully anticipates that as the company progressing through the S-MAP and RAMP process, these sections will become applicable and will be subsequently amended in future updates.

⁴⁷ Clarified in an email from Melissa K. Semcer, Program Manager Wildfire Safety Division at the California Public Utilities Commission on January 6, 2019.

5.3.8.1 Allocation methodology development and application

Program Name	Resource allocation methodology
Initiative Name	Allocation methodology development and application
Description	N/A – See general approach described in Section 5.3.8.

5.3.8.2 Risk reduction scenario development and analysis

Program Name	Resource allocation methodology
Initiative Name	Risk reduction scenario development and analysis
Description	N/A

5.3.8.3 Risk spend efficiency analysis

Program Name	Resource allocation methodology
Initiative Name	Risk spend efficiency analysis
Description	N/A

5.3.8.4 Other / not listen [only if an initiative cannot feasibly be classified within those listed above]

Program Name	Resource allocation methodology
Initiative Name	Other / not listen [only if an initiative cannot feasibly be classified within those listed above]
Description	N/A

The following table includes details regarding PacifiCorp’s resource allocation methodology as it applies to the company’s wildfire mitigation programs.

Table 28: Resource allocation methodology

Initiative activity	Year	Line miles to be treated	Spend/treated line mile	Ignition probability drivers targeted	Risk reduction	risk-spend efficiency	Other risk drivers addressed	Existing/new	Existing? What proceeding has reviewed	Memorandum account	If new? regulations	In/exceeding compliance with	Cite associated rule	Comments
1. Allocation methodology development and application	2019 plan	N/A - While PacifiCorp remains fully committed to the continued development and improvement of the company’s risk based decision making framework, many of the elements requested in this 2020 WMP filing may not be applicable to PacifiCorp, specifically many of the components requested in this section. At the guidance of the Wildfire Safety Division of the California Public Utilities Commission, these elements are marked “does not apply” or “not applicable” throughout the company’s filing.												
	2019 actual													
	2020													
	2021													
	2022													
	2020-2022 plan total													
2. Risk reduction scenario development and analysis	2019 plan	N/A - While PacifiCorp remains fully committed to the continued development and improvement of the company’s risk based decision making framework, many of the elements requested in this 2020 WMP filing may not be applicable to PacifiCorp, specifically many of the components requested in this section. At the guidance of the Wildfire Safety Division of the California Public Utilities Commission, these elements are marked “does not apply” or “not applicable” throughout the company’s filing.												
	2019 actual													
	2020													
	2021													
	2022													
	2020-2022 plan total													
3. Risk spend efficiency analysis	2019 plan	N/A - While PacifiCorp remains fully committed to the continued development and improvement of the company’s risk based decision making framework, many of the elements requested in this 2020 WMP filing may not be applicable to PacifiCorp, specifically many of the components requested in this section. At the guidance of the Wildfire Safety Division of the California Public Utilities Commission, these elements are marked “does not apply” or “not applicable” throughout the company’s filing.												
	2019 actual													
	2020													
	2021													
	2022													
	2020-2022 plan total													
4. Other/not listen [only is an initiative cannot feasibly be classified within those listen above]	2019 plan	N/A - While PacifiCorp remains fully committed to the continued development and improvement of the company’s risk based decision making framework, many of the elements requested in this 2020 WMP filing may not be applicable to PacifiCorp, specifically many of the components requested in this section. At the guidance of the Wildfire Safety Division of the California Public Utilities Commission, these elements are marked “does not apply” or “not applicable” throughout the company’s filing.												
	2019 actual													
	2020													
	2021													
	2022													
	2020-2022 plan total													

5.3.9 Emergency planning and preparedness

PacifiCorp's emergency planning and preparedness wildfire mitigation programs and overall 2020 WMP were developed in support of the company's overall Emergency Response Plan and integrate fully with the Utilities Code section 786.6 and GO-166. This Emergency Response Plan includes the tactics, policies, and procedures which are used in response to any emergency incident or planned event which impacts or has the potential to impact assets or customers within PacifiCorp's service territory. High level elements of this plan include but are not limited to:

- Elevated risk situational awareness notification processes in preparation of a potential emergency;
- Standardized hazard analysis;
- Emergency internal and external communication methods, protocols, and requirements during an emergency;
- Emergency notification protocols and processes;
- Resource availability and predetermined response times between areas of operation;
- Mutual assistance protocols and capability;
- Authority, governance, and key contacts; and
- After action reporting requirements to identify gaps and incorporate lessons learned.

PacifiCorp's Emergency Response Plan follows the National Incident Management System (NIMS) and the Incident Command System (ICS), and it is the foundation for the company's response to all crisis and emergencies. Consequently, PacifiCorp's Emergency Response Plan follows the all-hazards approach, which includes coordinating with other utilities and all levels of government. The plan supports an organized and efficient response to a wide variety of events of differing magnitudes. The all-hazard plan is a management tool providing a scalable response, organizational structure, procedures for information management, operational activities, a smooth transition to restoring normal services and the implementation of post-incident actions.

While described in the company's overall Emergency Response Plan, this basic approach is applicable with respect to any type of emergency event including wildfire events ranging from a relatively small wildfire that a local CALFIRE suppression agency is able to control, to the larger wildfire events which require a coordinated interagency response. As a result, PacifiCorp's internal response structure is organized for a wildfire event in a manner substantially identical to any other incident requiring an emergency response.

Executive Policy Group

The PacifiCorp Executive Policy Group consists of executives and administrators from key internal organizations and is activated based on the severity of the incident and need for strategic support. As part of the structure, the group collects and analyzes information, makes high-level strategic and procedural decisions, assists in the continuation of critical business processes, and helps facilitate cross-platform incident coordination in support of those responsible for managing the incident. Concerns for public safety is a key consideration in determining the need to activate the Executive Policy Group.

Emergency Operations Center (EOC)

Bringing representatives from various PacifiCorp organizations together in an Emergency Operations Center (EOC) optimizes unity of effort and enables staff to share information, provide policy guidance to on-scene personnel, plan for contingencies, deploy resources efficiently, and generally provide any support necessary. The composition of the team may vary depending on the nature and complexity of the incident.

Emergency Response / Service Restoration

Activation of the response function takes place according to the escalating threat, human impacts or severity of the incident. Most local incidents can be handled at the district operating level; but some incidents, like some wildland fires, require resources and support beyond the capabilities and authority of the district or regional operating area. Incidents that threaten the company as a whole (e.g. contagious disease, cyber-attacks), or place the company's stability at risk, may require high level management, strategic policy and financial decisions, crisis communications or other crisis management functions. Typically, even a relatively large wildfire would not threaten the company as whole, but a large, uncontrolled wildfire threatening catastrophic damage to people and property could require such crisis management functions. Operations return to normal as soon as practical, which typically occurs when the incident no longer needs the support and coordination functions provided by the EOC. If support functions can be managed by individual organizations through normal procedures, operations may return to normal.

Pre-incident Preparedness

If an event is anticipated or advanced warning is received (i.e. a winter storm warning), pre-incident activities may be implemented in advance of an actual event. Forecasts of extreme wildfire conditions may warrant pre-incident activities. These activities may include deploying additional response personnel and resources, customer and stakeholder advanced notification, and situational monitoring of wildfire conditions, such as wind speed, temperature, humidity and fuel conditions (all of which might contribute to the ignition and/or spread of a wildland fire).

Response to Incidents

The level of response is dictated by the seriousness of the incident. Incidents may be localized, or they may require support from an Emergency Operations Center. Moderate outage events and localized incidents require localized plan activation. In general, however, localized incidents can be quickly resolved with internal resources. These incidents have little or no impact on the public or normal operations and are managed by supervisors in the impacted district or area.

More complex outage events and potential threats which are beyond the scope of local management often require coordination of a considerable amount of resources, extended involvement and contact with internal business units and external stakeholders, and the potential for the incident to expand rapidly. This type of incident disrupts a significant number of customers, includes extended restoration time, or a perceived threat to service exists beyond the level where normal operating practices and local resources are sufficient to respond, and requires Emergency Operations Center activation. This type of incident might include, for example, a wildland fire, severe weather forecasts, or a security threat. Additional personnel from surrounding operations districts may be required to respond.

Mutual Assistance

Electric utilities have the ability to call upon other electric companies for emergency assistance, in the form of personnel, material or equipment, to aid in maintaining or restoring electric service when such service has been disrupted by acts of the elements, sabotage or equipment malfunctions. PacifiCorp is a member of several regional and national mutual assistance agreements with electric service providers. Parties to these agreements can request or provide assistance and resources to other members to support the restoration of electrical service when it cannot be restored in a timely manner by the affected company alone.

Community Outreach / External Collaboration

Dissemination of timely, accurate, accessible and actionable information to the public is important in all phases of PacifiCorp's incident management. The outage restoration call-back program is an automated system that simultaneously initiates call backs to hundreds or thousands of customers providing updated estimated times for restoration and to verify service has been restored. Communication with customers, key internal and external stakeholders and all levels of management as early as possible is key. The PacifiCorp Joint Information System (JIS) consists of processes and tools to facilitate communication with the public, news organizations, government entities and external stakeholders through social media, website restoration information, press releases and notification protocols while ensuring the messaging is consistent and comprehensive.

Regional Business Managers

PacifiCorp regional business managers maintain company relationships with local government jurisdictions and community organizations. Regional business managers are the primary contact for local leadership and critical customers in their area of responsibility.

District Operations Managers

District operations managers maintain relationships and exchange contact information with local first responders. In the event of a wildland fire, district managers deploy to the jurisdictional agency's Incident Command Post (ICP) to ensure electric safety awareness. The district operations manager acts as the liaison between the ICP and PacifiCorp's Control Center and Emergency Operations Center.

Emergency Managers

PacifiCorp's emergency management team interfaces and maintains relationships with federal and state emergency responders and mutual assistance groups. The emergency manager has contact information for state, county and tribal emergency managers, the state's Emergency Operations Center Emergency Support Functions (ESF) personnel, and the Geographic Area Coordination Centers dispatch centers for fire-related emergency response.

Training, Exercises and Continuous Improvement

An effective response to any incident is determined by the ability to implement a controlled incident command structure and to assume responsibility for restoration and recovery activities. It is critical individuals having responsibility for functions within the incident command system

are familiar with their responsibilities and have practiced performing those responsibilities. Individuals identified with primary or secondary responsibility within the command center structure complete an annual review of the overall disaster response and recovery plan. These individuals are required to contribute to post-crisis and emergency reporting, outlining any issues or concerns regarding their role and responsibilities. The incident command system is activated periodically throughout the year in the normal course of operations. An annual exercise is conducted to ensure that individuals otherwise not involved in incident management on a regular basis are practiced in responding.

PacifiCorp has a goal of continuous incident management improvement. PacifiCorp evaluates exercises and actual response incidents, by identifying issues raised during the exercise or incident and documenting lessons learned and corrective action plans. Multiple methods are used to gather exercise and post-action reviews, including participant and observer evaluation forms, remedial action tracking, and post-exercise or after-action incident reviews. Lessons learned may be implemented for inclusion in PacifiCorp's response and restoration procedures and incorporated in the emergency response document.

1. A description of how plan is consistent with disaster and emergency preparedness plan prepared pursuant to Public Utilities Code Section 768.6, including:

As previously described, PacifiCorp's emergency planning and preparedness wildfire mitigation programs and overall 2020 WMP were developed in support of the company's overall Emergency Response Plan and integrate fully with the Utilities Code section 768.6 and GO-166.

While PacifiCorp follows an identical approach to both emergency management of wildfire events and other emergency events, PacifiCorp recognizes that the specifics of emergency management for wildfire events can vary from other types of emergency management in terms of both preparation and response. For example, the governmental emergency responders with whom PacifiCorp will coordinate will be different in a wildfire as compared to other types of events. For small wildfires, PacifiCorp personnel will likely work directly with local CALFIRE personnel; for larger wildfires, PacifiCorp management will likely coordinate with an incident command center which could involve representatives of both state and federal agencies, likely including the Bureau of Land Management or the National Forest Service. Furthermore, preparation activities, fire precaution levels and relevant tools may differ significantly.

Where appropriate, PacifiCorp's emergency response plan components specific to Fire Prevention, Preparedness and Response not contemplated in the company's Emergency Response Plan have been included in the Fire Prevention, Preparedness, and Response Plan filed per GO 166 Attachment E.⁴⁸ Since originally filed in 2018, PacifiCorp has incorporated additional elements and details⁴⁹ such as incorporation of risk assessment, system resilience, and situational awareness aspects from the WMP into the company's Fire Prevention, Preparedness, and Response

⁴⁸ PacifiCorp's General Order 166 Attachment E, Fire Prevention, Preparedness, and Response Plan, or FPP, initially filed on 10/31/2018.

⁴⁹ As indicated in CPUC Data Request 1.7

Plan in an attempt to make the Fire Prevention Plan more analogous to a playbook describing the operational readiness and response in the event of a wildfire.

As with all of PacifiCorp's emergency planning and preparedness programs, the company intends to continue implementation of these programs, incorporate new elements such as training, resources, tools, and processes where appropriate, and translate lessons learned or effectiveness into long term program modification and evolution.

- a. Plans to prepare for and restore service, including workforce mobilization (including mutual aid and contractors) and prepositioning equipment and employees*

As with any response, PacifiCorp will attempt to preposition personnel and equipment into impacted areas in a proactive manner. However, PacifiCorp understands not every event supports a proactive approach but still maintains the ability to move personnel and equipment into impacted areas after the start of an event. Depending on the size and type of event, PacifiCorp will first deploy its internal workforce and then supplement the workforce with contractors. Should the event grow beyond the ability of the internal and contract workforce, PacifiCorp would reach out to others via mutual assistance agreements.

Electric utilities have the ability to call upon other electric companies for emergency assistance, in the form of personnel, material or equipment, to aid in maintaining or restoring electric service when such service has been disrupted by acts of the elements, sabotage or equipment malfunctions. PacifiCorp is a member of several regional and national mutual assistance agreements with electric service providers. Parties to these agreements can request or provide assistance and resources to other members to support the restoration of electrical service when it cannot be restored in a timely manner by the affected company alone. Details regarding membership, activation, notification, resource departure and arrival are all included in PacifiCorp's Emergency Response Plan. PacifiCorp intends to leverage these same programs and elements for emergency management of wildfire events.

- b. Emergency communications, including community outreach, public awareness, and communications efforts before, during, and after a wildfire in English, Spanish, and the top three primary languages used in California other than English or Spanish, as determined by United States Census data*

Dissemination of timely, accurate, accessible and actionable information to the public is important in all phases of PacifiCorp's incident management. Communications efforts are listed in the WMP, Emergency Response Plan and PSPS Playbook which provides both messaging and cadence for public and stakeholder communications throughout the preparation, response and restoration cycle. The outage restoration call-back program is an automated system that simultaneously initiates call backs to hundreds or thousands of customers providing updated estimated times for restoration and to verify service has been restored. Communication with customers, key internal and external stakeholders and all levels of management as early as possible is key. The PacifiCorp Joint Information System consists of processes and tools to facilitate communication with the public, news organizations, government entities and external stakeholders through social media, website restoration information, press

releases and notification protocols while ensuring the messaging is consistent and comprehensive. Additional information regarding PacifiCorp's community outreach, public awareness, and communication efforts can be found in Section 5.3.9.2.

- c. Showing that the utility has an adequate and trained workforce to promptly restore service after a major event, taking into account mutual aid and contractors*

PacifiCorp has dedicated resources in the California service territory available to respond as needed to events. In addition to the resources in California, PacifiCorp has internal resources from Oregon and Washington that can be deployed. In the event these resources are insufficient, mutual assistance agreements can also be deployed. The table below provides the approximate count of construction / response craft positions available to support California operations. While this count is relatively representative of available resources, these numbers may fluctuate as personnel change. Additionally, in the event these resources are insufficient, mutual assistance agreements can also be deployed as described in the previous section.

Location	Field Support	Field Responders	Total
California	10	30	45
Oregon and Washington	102	370	550
Total	112	400	595

2. Customer support in emergencies, including protocols for compliance with requirements adopted by the CPUC regarding activities to support customers during and after a wildfire, including

In reporting outages, PacifiCorp will continue its use of the company's customer outage management protocols and its real time outage map to inform customers regarding the presence and location of outages as well as the estimated restoration plans, consistent with standard operating practices. While the specifics of the frequency, content, and use of the messaging may change the overall tools and processes will be the same. Details regarding PacifiCorp's PSPS specific notifications, tools, messaging, and notifications have been included in Section 5.3.6.4.

PacifiCorp has also implemented a variety of consumer protections and procedures to assist the company's customers when a disaster impacts their communities, consistent with D.18-03-011. These protections are in addition to routine customer service protections as provided in communicating outages and restoration time estimates as are supported through the company's web portal and customer service organization. In considering which of these protections to implement and the duration of the relief so provided the type, scale, and size of the event are evaluated and a program is developed commensurate with the disaster. Some disasters will warrant greater relief than others. In the case of a larger, vast and far-reaching disaster, it may be reasonable to provide greater relief for a longer duration.

Specific details regarding these programs are included below.

a. Outage reporting

Specific to wildfire mitigation, PacifiCorp intends to enhance outreach through customer contact center to provide impacted customers with information regarding service interruptions, restoration efforts, along with relief support by adding to the scripts a high-level overview of customer protections, including directing the caller to the company webpage(s).

b. Support for low income customers

PacifiCorp's support for low income customers program includes the ability to:

- Freeze all standard and high-usage reviews for the CARE program eligibility until 12-month period has lapsed or potentially longer;
- Contact all community outreach contractors, community based organizations who assist in enrolling hard-to reach low-income customers, to better inform customers of these eligibility changes; and
- Partner with program administrator of the customer funded emergency assistance program for low-income customers and increase the assistance limit amount for affected customers during the following 12 month period.

c. Billing adjustments

PacifiCorp's billing adjustments include the ability to pro-rate monthly bill and any charges to the date of the emergency or subsequent damage to customer premises, and recalibrate approach for estimating energy usage during when premises are unoccupied as a result of the disaster to avoid estimating errors.

d. Deposit waivers

In the event of a wildfire emergency, PacifiCorp can waive deposit and late fee requirements for one year from the declared emergency.

e. Extended payment plans

In the event of a wildfire emergency, affected customers with existing service or those seeking to establish service at a new residence, who have prior arrearage, are offered a payment plan with 20 percent due, with equal installments for the remainder for no less than twelve billing cycles with no interest.

f. Suspension of disconnection and nonpayment fees

In the event of a wildfire emergency, PacifiCorp may suspend disconnection for non-payment and associated fees, and eliminate reporting to credit reporting agencies or any collection services for unpaid

g. Repair processing and timing

Immediately after the emergency, an assessment is made to identify the premises of affected customers whose utility service had been disrupted or degraded and, if applicable, the meter is removed.

h. Access to utility representatives

In the event of a wildfire emergency, PacifiCorp will directly contact customers with damaged facilities after the meter is removed from the damaged property and will expedite any work required to reinstate electrical service. Additionally, PacifiCorp will closely coordinate with local agencies to facilitate any permitting requirements and ensure work is completed as quickly as practical.

3. Coordination with Public Safety Partners, such as stationing utility personnel in county Emergency Operations Centers

Similar to PacifiCorp's general approach to emergency management, The Emergency Response Plan has procedures for the integration of utility personnel into the public sector response structure for an incident or event requiring electric utility support and coordination. If the public sector requests personnel to the Emergency Operations Center they will be made available.

PacifiCorp's emergency management team interfaces and maintains relationships with federal and state emergency responders and mutual assistance groups. The emergency manager has contact information for state, county and tribal emergency managers, the state's Emergency Operations Center Emergency Support Functions (ESF) personnel, and the Geographic Area Coordination Centers dispatch centers for fire-related emergency response. District operations managers also maintain relationships and exchange contact information with local first responders regularly. In the event of an incident where emergency operations are established, such as a wildland fire, a district manager or an identified company representative will deploy when needed or requested to the jurisdictional agency's Incident Command Post (ICP) to provide necessary electric utility support and coordination. The district operations manager or identified company representative acts as the liaison between the ICP and PacifiCorp's Control Center and Emergency Operations Center. Furthermore, PacifiCorp regional business managers maintain company relationships with local government jurisdictions and community organizations. Regional business managers are the primary contact for local leadership and critical customers in their area of responsibility

In preparation throughout the year, PacifiCorp also participates in various regulatory proceedings, town hall meetings, and open house events to engage other industry leaders, community leaders and members, and local emergency response management organization. These events focus on a range of aspects of PacifiCorp's wildfire emergency planning and preparedness programs, including communication protocols, notification protocols, and resource coordination efforts.

4. Describe the utility efforts to identify which additional languages are in use within the utility's service territory, including plan to identify and mitigation language access challenges.

PacifiCorp uses a multi-faceted effort to communicate information regarding wildfire prevention and response to customers. Communication methods include the following: targeted radio public service announcements; social media posts on Facebook and Twitter; informative banners on website homepage, wildfire safety landing page on website; targeted bill messages; press releases posted to our website and distributed to local media; news articles for local chamber publications; prepared talking points for regional business managers; pre-determined outreach to local community authorities and organizations to participate in prevention and preparedness focused town halls; and live informative Facebook events. Additional information regarding PacifiCorp's community outreach, public awareness, and communication efforts can be found in Section 5.3.9.2. The following subsection include detailed descriptions of PacifiCorp's emergency planning and preparedness wildfire mitigation initiatives. Each of these programs is ultimately governed by PacifiCorp's Emergency Response Plan and Fire Prevention, Preparedness, and Response Plan.

5.3.9.1 Adequate and trained workforce for service restoration

Program Name	Emergency planning and preparedness
Initiative Name	Adequate and trained workforce for service restoration
Description	<p>This program includes the implementation of training, tools, work processes, and procedures to ensure PacifiCorp maintains an adequate and trained workforce for service restoration, with a specific focus on wildfire preparedness and restoration efforts in response to a wildfire or PSPS event.</p> <p>To ensure the identified workforce have the proper wildfire mitigation training, each year refresher training is provided to applicable field employees within the HFTD. This involves reviewing operating practices that reduce wildfire risk while performing routine work and confirming the availability of fire mitigation / suppression tools before fire season.</p> <p>To ensure adequate workforce levels are available when required, PacifiCorp has access to additional resources in other service territory areas that can be deployed as needed. Additionally, PacifiCorp is a member of mutual assistance agreements with partnering utilities that provides access to even more resources if required when responding to an event.</p>
Timeline to Minimize Risk [Planned/ Implemented]	Implemented
Rationale for Program	<p>When an emergency or major events occurs, it is critical the resources tasked with rebuilding infrastructure to restore service are sufficient and work in such a way as to not escalate risk. Similar to when performing planned or routine work, PacifiCorp field operations are able to mitigate some wildfire risk by utilizing specific operating procedures during fire season in heightened fire risk areas.</p> <p>Trained: While PacifiCorp is experienced with and prepared to respond to emergency events, responding to an emergency involving a wildfire event can pose specific challenges. System operators or local emergency response crews may need field operations personnel to gather more extensive information and assess local conditions differently than with other type emergencies or normal operating conditions. Field personnel may also need to use specialized tools or monitor and react to changing weather patterns.</p> <p>Adequate: In certain situations the required resources to respond to an event, or restore after an event can be more than what is available in the local district on a daily basis. For these cases where an event exceeds the local district's</p>

		capability to respond, PacifiCorp needs to be able to have access to additional resources to ensure adequate resources can be deployed to mitigate or respond to the wildfire event.
	Prioritization Approach	While access to available resources is a system wide program the specific wildfire mitigation training is prioritized for staff actively working within the HFTD zones in California. However, as the company may pull from additional resources during an emergency, PacifiCorp provides the training to all applicable employees that might respond to a wildfire event.
	Plan for audits/quality checks	In general as part of the emergency management program, PacifiCorp evaluates exercises and actual response events, by identifying issues raised during the event and documenting lessons learned and corrective action plans. Multiple methods are used to gather exercise and post-action reviews, including participant and observer evaluation forms, remedial action tracking, and post-exercise or after-action incident reviews. Lessons learned may be implemented for inclusion in PacifiCorp's response and restoration procedures and incorporated in the emergency response document.
	Planned demonstration of effectiveness over time	An effective response to any event is determined by the ability to implement a coordinated response for restoration and recovery activities, which includes, as a component, the availability of an adequate and trained workforce. This determination would be evaluated as part of the post event lessons learned process.
Planned Evolution	General	As with all of PacifiCorp's emergency planning and preparedness programs, the company intends to continue implementation of these programs, incorporate new elements such as training, resources, tools, and processes where appropriate, and translate lessons learned or effectiveness into long term program modification and evolution. While PacifiCorp is early in the implementation of its multi-year WMP, it is challenging to know exactly how and when each program will evolve. However, where appropriate, PacifiCorp has provided the company's estimate.
	Before the upcoming wildfire season	Complete training in HFTD operations locations
	Before the next annual update	Continued training regarding wildfire response in non-HFTD locations
	Within the next 3 years	Continued evolution based on lessons learned.

	Within the next 10 years	Continued evolution based on lessons learned.
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5.3.9.2 Community outreach, public awareness, and communication efforts

Program Name	Emergency planning and preparedness
Initiative Name	Community outreach, public awareness, and communication efforts
Description	Dissemination of timely, accurate, accessible and actionable information to the public is important in all phases of PacifiCorp's incident management. This program also incorporates creation of reading materials and guides, maintenance and upkeep of a wildfire safety specific publicly available website, the use of print, email, and phone notifications, as well as in person communication with communities at public information sessions and town hall meetings.
Timeline to Minimize Risk [Planned/ Implemented]	Implemented
Rationale for Program	<p>While PacifiCorp is working hard to reduce wildfire risk associated with potential utility ignition, it is also critical that customers and member of communities throughout the company's service territory take steps to be prepared during wildfire season and mitigate localized wildfire risk. These steps might include creating an emergency plan or kit, updating contact information, and creating a defensible space through tree trimming and brush clearing around dwellings. Communication of these potential steps is key.</p> <p>Additionally, dissemination of timely, accurate, accessible and actionable information to the public is important in all phases of PacifiCorp's incident management to ensure an event does not escalate and that restoration activities can be performed safely and efficiently.</p>
Prioritization Approach	This program applies company-wide with an initial prioritization in the highest risk areas such as Tier 2 and Tier 3.
Plan for audits/quality checks	The incident command system is activated periodically throughout the year in the normal course of operations. Additionally, an annual exercise is conducted to ensure that individuals otherwise not involved in incident management on a regular basis are practiced in responding. As a part of these events, individuals identified with primary or secondary responsibility within the command center structure complete an annual review of the overall

		<p>disaster response and recovery plan. These individuals are required to contribute to post-crisis and emergency reporting, outlining any issues or concerns regarding their role and responsibilities.</p> <p>PacifiCorp has a goal of continuous incident management improvement which includes, as a component, effective community outreach, public awareness, and communication effort. PacifiCorp evaluates exercises and actual response incidents, by identifying issues raised during the exercise or incident and documenting lessons learned and corrective action plans. Multiple methods are used to gather exercise and post-action reviews, including participant and observer evaluation forms, remedial action tracking, and post-exercise or after-action incident reviews. Lessons learned may be implemented for inclusion in PacifiCorp's response and restoration procedures and incorporated in the emergency response document.</p> <p>Additionally, PacifiCorp leverages existing customer service processes and local leaders to capture feedback and improve communications, including the accessibility and content of the company's website.</p>
Planned demonstration of effectiveness over time		An effective response to any incident is determined by the ability to implement a controlled incident command structure and to assume responsibility for restoration and recovery activities which, as a component, includes effectiveness community outreach, public awareness, and communication efforts.
Planned Evolution	General	As with all of PacifiCorp's emergency planning and preparedness programs, the company intends to continue implementation of these programs, incorporate new elements such as training, resources, tools, and processes where appropriate, and translate lessons learned or effectiveness into long term program modification and evolution. While PacifiCorp is early in the implementation of its multi-year WMP, it is challenging to know exactly how and when each program will evolve. However, where appropriate, PacifiCorp has provided the company's reasonable best estimate.
	Before the upcoming wildfire season	Continued implementation of 2019 work with an update of new recommendations and planned activities
	Before the next annual update	No anticipated or planned evolution at this time.
	Within the next 3 years	While PacifiCorp is early in the implementation of its multi-year WMP, it is challenging to know exactly how and when this program will evolve. However, PacifiCorp anticipates a change in either the frequency, type, or platform of communication due to changing technologies, customer preference, and changing risks/needs.
	Within the next 10 years	Continued evolution of frequency, type, or platform/method of communication due to changing technologies, customer preference, and changing risks/needs

5.3.9.3 Customer support in emergencies

Program Name	Emergency planning and preparedness
Initiative Name	Customer support in emergencies
Description	<p>This program includes PacifiCorp’s consumer protections and procedures implemented to assist the company’s customers when a disaster impacts their communities, consistent with D.18-03-011. The consumer protections include, but may not be limited to the following:</p> <ul style="list-style-type: none"> • Waiving deposit requirements for customers in the affected area; • Expediting opening and closing accounts and new services; • Suspending energy usage estimates when the structures are unoccupied during the emergency event; • Discontinuing billing, including minimum billings for customers incapable of receiving electric service; • Offering long-term payment plans (up to 12 months) on amounts in arrears for customers impacted by the emergency event; • Discontinuing disconnections and late fees for non-payment in designated areas; • Freezing standard and high-usage reviews for CARE customers. <p>See Section 5.3.9 for more details.</p>
Timeline to Minimize Risk [Planned/ Implemented]	Implemented
Rationale for Program	When emergencies occur, depending on the type, scale, and size of the event, customers may require support ranging from outage communication and estimated restoration times to discontinuation of billing or application of minimum billing. Additionally communication and support is required during a PSPS event for customers and communities, including known vulnerable customers and critical facilities.
Prioritization Approach	System wide application

Plan for audits/quality checks		<p>The incident command system is activated periodically throughout the year in the normal course of operations. Additionally, an annual exercise is conducted to ensure that individuals otherwise not involved in incident management on a regular basis are practiced in responding. As a part of these events, individuals identified with primary or secondary responsibility within the command center structure complete an annual review of the overall disaster response and recovery plan. These individuals are required to contribute to post-crisis and emergency reporting, outlining any issues or concerns regarding their role and responsibilities.</p> <p>PacifiCorp has a goal of continuous incident management improvement which includes, as a component, customer support in emergencies. PacifiCorp evaluates exercises and actual response incidents, by identifying issues raised during the exercise or incident and documenting lessons learned and corrective action plans. Multiple methods are used to gather exercise and post-action reviews, including participant and observer evaluation forms, remedial action tracking, and post-exercise or after-action incident reviews. Lessons learned may be implemented for inclusion in PacifiCorp's response and restoration procedures and incorporated in the emergency response document.</p> <p>Additionally, PacifiCorp leverages existing customer service processes and local leaders to capture feedback and improve communications, including the accessibility and content of the company's website.</p>
Planned demonstration of effectiveness over time		An effective response to any incident is determined by the ability to implement a controlled incident command structure and to assume responsibility for restoration and recovery activities which, as a component, includes customer support.
Planned Evolution	General	As with all of PacifiCorp's emergency planning and preparedness programs, the company intends to continue implementation of these programs, incorporate new elements such as training, resources, tools, and processes where appropriate, and translate lessons learned or effectiveness into long term program modification and evolution. While PacifiCorp is early in the implementation of its multi-year WMP, it is challenging to know exactly how and when each program will evolve. However, where appropriate, PacifiCorp has provided the company's reasonable best estimate.
	Before the upcoming wildfire season	Continued implementation of program
	Before the next annual update	Continued implementation of program

	Within the next 3 years	While PacifiCorp is early in the implementation of its multi-year WMP, it is challenging to know exactly how and when this program will evolve. However, PacifiCorp anticipates potential evolution of regulatory requirements or a shift in customer needs in the next three years.
	Within the next 10 years	Continued evolution of and integration of new needs/requirements.

5.3.9.4 Disaster and emergency preparedness plan

Program Name	Emergency planning and preparedness
Initiative Name	Disaster and emergency preparedness plan
Description	The details regarding PacifiCorp's emergency preparedness plan are included in the general discussion in Section 5.3.9 beginning on page 105. Wildfire mitigation specific components are also included in the general discussion beginning on page 105.
Timeline to Minimize Risk [Planned/ Implemented]	Implemented
Rationale for Program	PacifiCorp's emergency planning and preparedness wildfire mitigation programs and overall 2020 WMP were developed in support of the company's overall Emergency Response Plan and integrate fully with the Utilities Code section 786.6 and GO-166. Additionally, disaster and emergency preparedness plan remains a critical cornerstone of the company's process and procedure to ensure the safe delivery of reliable power. Specific to wildfire risk mitigation, this plan ensures that PacifiCorp is prepared to respond to a wildfire event, reducing the potential for escalation and accelerating restoration.
Prioritization Approach	This program applies company-wide with an initial prioritization in the highest risk areas such as Tier 2 and Tier 3.
Plan for audits/quality checks	<p>The incident command system is activated periodically throughout the year in the normal course of operations. Additionally, an annual exercise is conducted to ensure that individuals otherwise not involved in incident management on a regular basis are practiced in responding. As a part of these events, individuals identified with primary or secondary responsibility within the command center structure complete an annual review of the overall disaster response and recovery plan. These individuals are required to contribute to post-crisis and emergency reporting, outlining any issues or concerns regarding their role and responsibilities.</p> <p>PacifiCorp has a goal of continuous incident management improvement which includes, as a component, the disaster and emergency preparedness plan. PacifiCorp evaluates exercises and actual response incidents, by identifying issues raised during the exercise or incident and documenting lessons learned and corrective action plans. Multiple methods</p>

		are used to gather exercise and post-action reviews, including participant and observer evaluation forms, remedial action tracking, and post-exercise or after-action incident reviews. Lessons learned may be implemented for inclusion in PacifiCorp's response and restoration procedures and incorporated in the emergency response document.
	Planned demonstration of effectiveness over time	An effective response to any incident is determined by the ability to implement a controlled incident command structure and to assume responsibility for restoration and recovery activities, which includes, as a component, the disaster and emergency preparedness plan.
Planned Evolution	General	As with all of PacifiCorp's emergency planning and preparedness programs, the company intends to continue implementation of these programs, incorporate new elements such as training, resources, tools, and processes where appropriate, and translate lessons learned or effectiveness into long term program modification and evolution. While PacifiCorp is early in the implementation of its multi-year WMP, it is challenging to know exactly how and when each program will evolve. However, where appropriate, PacifiCorp has provided the company's reasonable best estimate.
	Before the upcoming wildfire season	Continued implementation of plan in CA with specific elements focused on response efforts in the HFTD
	Before the next annual update	No anticipated or planned evolution at this time.
	Within the next 3 years	While PacifiCorp is early in the implementation of its multi-year WMP, it is challenging to know exactly how and when this program will evolve. However, PacifiCorp anticipates a change in either the regulatory requirements or risk assessment and hazards that require a shift or evolution to the program in the next three years.
	Within the next 10 years	Continued evolution of the plan per lessons learned and After Action Reviews

5.3.9.5 Preparedness and planning for service restoration

Program Name	Emergency planning and preparedness
Initiative Name	Preparedness and planning for service restoration
Description	The details regarding PacifiCorp's emergency preparedness plan are included in the general discussion in Section 5.3.9 beginning on page 105. Wildfire mitigation specific components are also included in the general discussion beginning on page 105.
Timeline to Minimize Risk [Planned/ Implemented]	Implemented
Rationale for Program	PacifiCorp's emergency planning and preparedness wildfire mitigation programs and overall 2020 WMP were developed in support of the company's overall Emergency Response Plan and integrate fully with the Utilities Code section 786.6 and GO-166. Additionally, disaster and emergency preparedness plan remains a critical cornerstone of the company's process and procedure to ensure the safe delivery of reliable power. Specific to wildfire risk mitigation, this plan ensures that PacifiCorp is prepared to respond to a wildfire event, reducing the potential for escalation and accelerating restoration.
Prioritization Approach	This program applies company-wide with an initial prioritization in the highest risk areas such as Tier 2 and Tier 3.
Plan for audits/quality checks	<p>The incident command system is activated periodically throughout the year in the normal course of operations. Additionally, an annual exercise is conducted to ensure that individuals otherwise not involved in incident management on a regular basis are practiced in responding. As a part of these events, individuals identified with primary or secondary responsibility within the command center structure complete an annual review of the overall disaster response and recovery plan. These individuals are required to contribute to post-crisis and emergency reporting, outlining any issues or concerns regarding their role and responsibilities.</p> <p>PacifiCorp has a goal of continuous incident management improvement which includes, as a component, the preparedness and planning for service restoration. PacifiCorp evaluates exercises and actual response incidents, by identifying issues raised during the exercise or incident and documenting lessons learned and corrective action plans.</p>

		Multiple methods are used to gather exercise and post-action reviews, including participant and observer evaluation forms, remedial action tracking, and post-exercise or after-action incident reviews. Lessons learned may be implemented for inclusion in PacifiCorp's response and restoration procedures and incorporated in the emergency response document.
	Planned demonstration of effectiveness over time	An effective response to any incident is determined by the ability to implement a controlled incident command structure and to assume responsibility for restoration and recovery activities, which includes, as a component, the overall preparedness and planning for service restoration.
Planned Evolution	General	As with all of PacifiCorp's emergency planning and preparedness programs, the company intends to continue implementation of these programs, incorporate new elements such as training, resources, tools, and processes where appropriate, and translate lessons learned or effectiveness into long term program modification and evolution. While PacifiCorp is early in the implementation of its multi-year WMP, it is challenging to know exactly how and when each program will evolve. However, where appropriate, PacifiCorp has provided the company's reasonable best estimate.
	Before the upcoming wildfire season	Continued implementation of plan in CA with specific elements focused on response efforts in the HFTD
	Before the next annual update	No anticipated or planned evolution at this time.
	Within the next 3 years	While PacifiCorp is early in the implementation of its multi-year WMP, it is challenging to know exactly how and when this program will evolve. However, PacifiCorp anticipates a change in either the regulatory requirements or risk assessment and hazards that require a shift or evolution to the program in the next three years.
	Within the next 10 years	Continued evolution of the plan through After Action Reviews

5.3.9.6 Protocols in place to learn from wildfire events

Program Name	Emergency planning and preparedness
Initiative Name	Protocols in place to learn from wildfire events
Description	<p>PacifiCorp's leverages existing systems and processes included in the company's Emergency Response Plan to learn from wildfire events in the same manner PacifiCorp learns from any emergency event. Therefore, PacifiCorp does not have a specific program for incorporation of lessons learned that is not already covered in a previous program.</p> <p>As is further described in Section 5.3.9, An effective response to any incident is determined by the ability to implement a controlled incident command structure and to assume responsibility for restoration and recovery activities. It is critical that individuals having responsibility for functions within the incident command system are familiar with their responsibilities and have practice performing those responsibilities. Individuals identified with primary or secondary responsibility within the command center structure complete an annual review of the overall disaster response and recovery plan. These individuals are required to contribute to post-crisis and emergency reporting, outlining any issues or concerns regarding their role and responsibilities.</p> <p>The incident command system is activated periodically throughout the year in the normal course of operations. Additionally, an annual exercise is conducted to ensure that individuals otherwise not involved in incident management on a regular basis are practiced in responding.</p> <p>PacifiCorp has a goal of continuous incident management improvement. PacifiCorp evaluates exercises and actual response incidents, by identifying issues raised during the exercise or incident and documenting lessons learned and corrective action plans. Multiple methods are used to gather exercise and post-action reviews, including participant and observer evaluation forms, remedial action tracking, and post-exercise or after-action incident reviews. Lessons learned may be implemented for inclusion in PacifiCorp's response and restoration procedures and incorporated in the emergency response document.</p>

5.3.9.7 Other / not listed [only if an initiative cannot feasibly be classified within those listed below]

Program Name	Emergency planning and preparedness
Initiative Name	Other / not listed [only if an initiative cannot feasibly be classified within those listed below]
Description	PacifiCorp does not, at this time, have any other emergency planning and preparedness wildfire mitigation programs

The following table includes details regarding PacifiCorp's emergency planning and preparedness as it applies to the company's wildfire mitigation programs.

Table 29: Emergency planning and preparedness


Initiative activity	Year	Line miles to be treated	Spend/treated line mile	Ignition probability drivers targeted	Risk reduction	risk-spend efficiency	Other risk drivers addressed	Existing/new	Existing: What proceeding has reviewed program	If new: Memorandum account	In/exceeding compliance with regulations	Cite associated rule	Comments
1. Adequate and trained workforce for service restoration	2019 plan	N/A - System Wide	N/A - Not a specifically budgeted program	N/A - Response related	N/A	N/A	Reduces risk of escalation; Supports accelerated restoration to reduced impact of an event on communities	Existing with wildfire specific modifications	GRC	N/A	N/A	GO 166	Program is an extension of existing emergency management programs
	2019 actual												
	2020												
	2021												
	2022												
	2020-2022 plan total												
2. Community outreach, public awareness, and communication efforts	2019 plan	N/A - System Wide	N/A - Not a specifically budgeted program	Contact from objects	N/A	N/A	Reduces risk of escalation; Supports accelerated restoration to reduced impact of an event on communities	Existing with wildfire specific modifications	GRC	N/A	N/A	GO 166	Community outreach reduces the potential of third party contact and supports restoration
	2019 actual												
	2020												
	2021												
	2022												
	2020-2022 plan total												
3. Customer support in emergencies	2019 plan	N/A - System Wide	N/A - Not a specifically budgeted program	N/A - Response related	N/A	N/A	Reduces risk of escalation; Supports accelerated restoration to reduced impact of an event on communities	Existing with wildfire specific modifications	GRC	N/A	N/A	R.18-12-005	Program is an extension of existing emergency management programs
	2019 actual												
	2020												
	2021												
	2022												
	2020-2022 plan total												
4. Disaster and emergency preparedness plan	2019 plan	N/A - System Wide	N/A - Not a specifically budgeted program	N/A - Response related	N/A	N/A	Reduces risk of escalation; Supports accelerated restoration to reduced impact of an event on communities	Existing with wildfire specific modifications	GRC	N/A	N/A	GO 166	Program is an extension of existing emergency management programs
	2019 actual												
	2020												
	2021												
	2022												
	2020-2022 plan total												

Initiative activity	year	Line miles to be treated	Spend/treated line mile	Ignition probability drivers targeted	Risk reduction	risk-spend efficiency	Other risk drivers addressed	Existing/new	Existing: What proceeding has reviewed program	If new: Memorandum account	In/exceeding compliance with regulations	Cite associated rule	Comments
5. Preparedness and planning for service restoration	2019 plan	N/A - System Wide	N/A - Not a specifically budgeted program	N/A - Response related	N/A	N/A	Reduces risk of escalation; Supports accelerated restoration to reduced impact of an event on communities	Existing with wildfire specific modifications	GRC	N/A	N/A	GO 166	Program is an extension of existing emergency management programs
	2019 actual												
	2020												
	2021												
	2022												
	2020-2022 plan total												
6. Protocols in place to learn from wildfire events	2019 plan	PacifiCorp's leverages existing systems and processes included in the company's Emergency Response Plan to learn from wildfire events in the same manner PacifiCorp learns from any emergency event. Therefore, PacifiCorp does not have a specific program for incorporation of lessons learned that is not already covered in a previous program.											
	2019 actual												
	2020												
	2021												
	2022												
	2020-2022 plan total												
7. Other/not listen [only is an initiative cannot feasibly be classified within those listen above]	2019 plan	PacifiCorp does not, at this time, have any other emergency planning and preparedness wildfire mitigation programs											
	2019 actual												
	2020												
	2021												
	2022												
	2020-2022 plan total												

5.3.10 Stakeholder cooperation and community engagement

5.3.10.1 Community engagement

Program Name	Stakeholder cooperation and community engagement
Initiative Name	Community engagement
Description	<p>While PacifiCorp is working hard to reduce wildfire risk association with potential utility related ignition, it is also critical that customers and member of communities throughout the company's service territory take steps to be prepared during wildfire season and mitigate localized wildfire risk. As included in Section 5.3.9.2, these steps might include creating an emergency plan or kit, updating contact information, and creating a defensible space through tree trimming and brush clearing around dwellings. Communication of these potential steps is key.</p> <p>Additionally, dissemination of timely, accurate, accessible and actionable information to the public is important in all phases of PacifiCorp's incident management, including preparation for emergencies throughout the year. As part of this preparation, PacifiCorp participates in various regulatory proceedings, town hall meetings, and open house events to engage other industry leaders, community leaders and members, and local emergency response management organization. These events focus on a range of aspects of PacifiCorp's wildfire emergency planning and preparedness programs, including communication protocols, notification protocols, and resource coordination efforts.</p> <p>Furthermore, PacifiCorp uses a multi-faceted effort to communicate information regarding wildfire prevention and response to customers and communities. Communication methods include the following: targeted radio public service announcements; social media posts on Facebook and Twitter; informative banners on website homepage, wildfire safety landing page on website; targeted bill messages; press releases posted to our website and distributed to local media; news articles for local chamber publications; prepared talking points for regional business managers; pre-determined outreach to local community authorities and organizations to participate in prevention and preparedness focused town halls; and live informative Facebook events.</p> <p>Finally, as a part of PacifiCorp's standard operating procedures and resource structure, Regional Business Managers, PacifiCorp employees that live and work within the communities served, typically lead PacifiCorp's involvement in these initiatives to ensure the community is being engaged with consistently regarding all relevant programs, including wildfire mitigation programs.</p>



However, at this time, PacifiCorp does not have a specific stakeholder cooperation and community engagement wildfire mitigation program focused on community engagement. While PacifiCorp values community engagement as a wildfire risk mitigation strategy, the company has incorporated, as an element, stakeholder cooperation and community engagement as a component of its overall Emergency Response Programs as included in Section 5.3.9.2.

5.3.10.2 Cooperation and best practice sharing with agencies outside CA

Program Name	Stakeholder cooperation and community engagement
Initiative Name	Cooperation and best practice sharing with agencies outside CA
Description	<p>PacifiCorp actively participates in regulatory proceedings, workshops, and initiatives as a part of the company's wildfire mitigation efforts. Additionally, as PacifiCorp operates in 6 different states throughout the western United States, the company is well positioned to cooperate, communicate, and collaborate with agencies and organizations outside of California. PacifiCorp broadly shares experience with stakeholders, communities, and relevant agencies across these six states. Examples of such opportunities include participation in special meetings and presentations called by the Commissioners in Oregon, wildfire preparation town halls in high risk communities, collaboration with the Oregon Department of Forestry to enhance restoration planning and situational awareness, and internal best practices sharing between peers throughout PacifiCorp.</p> <p>Furthermore, as a part of Berkshire Hathaway Energy, PacifiCorp is able to share lessons learned across multiple utilities throughout the US, Canada, and the United Kingdom and inform program development and evolution, including, as an example, active participation and best practices sharing with regulators in Alberta, Canada.</p> <p>While values exists in cooperation and best practice sharing with agencies outside of California, PacifiCorp, at this time, does not have a specific stakeholder cooperation and community engagement wildfire mitigation plan focused on cooperation and best practice sharing with agencies outside California.</p>

5.3.10.3 Cooperation with suppression agencies

Program Name	Stakeholder cooperation and community engagement
Initiative Name	Cooperation with suppression agencies
Description	<p>Similar to PacifiCorp’s general approach to emergency management, The Emergency Response Plan has procedures for the integration of utility personnel into the public sector response structure for any incident or event, including wildfire events.</p> <p>In times of emergencies, PacifiCorp’s emergency management group interfaces and maintains relationships with federal and state emergency responders and mutual assistance groups, including fire suppression agencies. The emergency manager has contact information for state, county and tribal emergency managers, the state’s Emergency Operations Center Emergency Support Functions (ESF) personnel, and the Geographic Area Coordination Centers dispatch centers for fire-related emergency response.</p> <p>Therefore, as opposed to having a separate program, at this time, cooperation with suppression agencies is a component of the company’s emergency planning and preparedness programs outlined in Section 5.3.9.</p>

5.3.10.4 Forest service and fuel reduction cooperation and joint roadmap

Program Name	Stakeholder cooperation and community engagement
Initiative Name	Forest service and fuel reduction cooperation and joint roadmap
Description	<p>As described in PacifiCorp’s vegetation management programs and in Section 5.3.5, PacifiCorp has worked with and made joint efforts with the Edison Electric Institute and other utilities to collaborate with federal agencies to expedite approvals for vegetation management work on transmission and distribution facilities. PacifiCorp representatives participated in the drafting of an agreement specifically aimed at building collaboration between the federal agencies and the utilities on these issues. As a result, the Memorandum of Understanding on Vegetation Management for Powerline Rights-of-Way, dated September 29, 2016, was signed by the Edison Electric Institute, Utility Arborist Association, the National Park Service, United States Fish and Wildlife Service, Bureau of Land Management (BLM), United States Forest Service, and the United States Environmental Protection Service. The purpose of the MOU is to facilitate cooperation and coordination among the parties regarding vegetation management within and immediately adjacent to existing and future powerline right of ways and associated facilities. The MOU facilitates “implementation of cost effective and environmentally sound vegetation management plans, procedures, and practices for powerline ROWs that will reduce adverse environmental and cultural impacts while enhancing the ability of utilities to provide uninterrupted electrical service to customers and address public safety.” (MOU at 4.)</p> <p>These efforts culminated in the recent passage of legislation by the United States Congress. Section 211 of the Omnibus Appropriations Act of 2018 amended Title V of the Federal Land Policy and Management Act. The new law, codified at 43 U.S.C.A. § 1772, establishes a formal procedure for submission and approval of vegetation management plans, with an emphasis on standardized, consistent plans and minimizing the need for case-by-case approvals for hazard tree removal. PacifiCorp understands that the BLM and the USFS, the two federal agencies responsible for the lands where PacifiCorp’s rights-of-way are located, are engaged in a rulemaking to “develop a consolidated and coordinated process for the review and approval of plans.” 43 U.S.C.A. § 1772(c)(4)(A). When those regulations are finalized, PacifiCorp plans to submit a vegetation management plan under 43 U.S.C.A. § 1772(c)(1) to both the BLM and the USFS.</p> <p>Additionally, PacifiCorp collaborates with local emergency responders or state organizations as needed to reduce fuel and facilitate improved escape or evacuation routes, which includes the forest service. For example, in 2019 Governor Gavin Newsom directed CALFIRE to determine which communities within each county had the greatest wildfire risk.</p>

CALFIRE determined the Lake Shastina area as one of the high priority project areas. As a result, PacifiCorp partnered with CALFIRE in Big Springs, California on the Lake Shastina Fuels Reduction Project to improve escape routes for residents and access for emergency responders.

This project involved clearing 100 feet on each side of road of State Highway 97, Big Springs Road and 2 miles west on Jackson Ranch Road. Any utility distribution or transmission facilities that fell within the 100' clearing were also targeted for tree removal in associated rights of ways. Trees and vegetation that had potential to grow into facilities (non-compatible vegetation) and brush were removed in a distribution utility corridor and 2 transmission corridors that fell within the footprint of the CALFIRE fuel reduction project. CALFIRE also removed all brush species, thinned small trees to provide 20-30' spacing and pruned all remain trees 6-8' above ground.

While collaboration such as this is critical to the overall reduction of wildfire risk in the state of California, PacifiCorp, at this time, does not have a specific program dedicated to this effort. Instead, these efforts are on an as-needed basis and incorporates additional efforts to manage community environments within other programs, such as those included in Section 5.3.9.2 and Section 5.3.10.1 and the company's overall vegetation management and inspections programs described in Section 5.3.5.

5.3.10.5 Other / not listed [only if an initiative cannot feasibly be classified within those listed above]

Program Name	Stakeholder cooperation and community engagement
Initiative Name	Other / not listed [only if an initiative cannot feasibly be classified within those listed below]
Description	At this time, PacifiCorp does not have any other stakeholder cooperation and community engagement programs.

The following table includes details regarding PacifiCorp's stakeholder cooperation and community engagement wildfire mitigation programs.

Table 30: Stakeholder cooperation and community engagement

Initiative activity	year	Line miles to be treated	Spend/treated line mile	Ignition probability drivers	Risk reduction	risk-spend efficiency	Other risk drivers addressed	Existing/new	Existing: What proceeding has reviewed	Memorandum account	In/exceeding compliance with	Cite associated rule	Comments
1. Community engagement	2019 plan	However, at this time, PacifiCorp does not have a specific stakeholder cooperation and community engagement wildfire mitigation program focused on community engagement. While PacifiCorp values community engagement as a wildfire risk mitigation strategy, the company has incorporated, as an element, stakeholder cooperation and community engagement as a component of its overall Emergency Response Programs as included in Section 5.3.9.2.											
	2019 actual												
	2020												
	2021												
	2022												
	2020-2022 plan total												
2. Cooperation and best practice sharing with agencies outside of CA	2019 plan	N/A - System Wide	N/A - Not a specifically budgeted program	All	N/A	N/A	Reduces risk of escalation through support of accelerated restoration	Existing	N/A	N/A	N/A	N/A	N/A
	2019 actual												
	2020												
	2021												
	2022												
	2020-2022 plan total												
3. Cooperation with suppression agencies	2019 plan	In times of emergencies, PacifiCorp’s emergency management group interfaces and maintains relationships with federal and state emergency responders and mutual assistance groups, including fire suppression agencies. The emergency manager has contact information for state, county and tribal emergency managers, the state’s Emergency Operations Center Emergency Support Functions (ESF) personnel, and the Geographic Area Coordination Centers dispatch centers for fire-related emergency response.											
	2019 actual												
	2020												
	2021												
	2022												
	2020-2022 plan total												
4. Forest service and fuel reduction cooperation and joint roadmap	2019 plan	While collaboration such as this is critical to the overall reduction of wildfire risk in the state of CA, PacifiCorp, at this time, does not have a specific program dedicated to this effort. Instead, these efforts are on an as-needed basis and incorporates additional efforts to manage community environments within other programs, such as those included in Section 5.3.9.2 and Section 5.3.10.1 and the company’s overall vegetation management and inspections programs described in Section 5.3.5.											
	2019 actual												
	2020												
	2021												
	2022												
	2020-2022 plan total												
5.Other/not listen [only is an initiative cannot feasibly be classified within those listen above]	2019 plan	At this time, PacifiCorp does not have any other stakeholder cooperation and community engagement programs.											
	2019 actual												
	2020												
	2021												
	2022												
	2020-2022 plan total												

5.3.11 Definitions of initiative activities by category

Category	Initiative	Definition
A. Risk mapping and simulation	A summarized risk map that shows the overall ignition probability and estimated wildfire consequence along the electric lines and equipment	Development and use of tools and processes to develop and update risk map and simulations and to estimate risk reduction potential of initiatives for a given portion of the grid (or more granularly, e.g., circuit, span, or asset). May include verification efforts, independent assessment by experts, and updates.
	Climate-driven risk map and modelling based on various relevant weather scenarios	Development and use of tools and processes to estimate incremental risk of foreseeable climate scenarios, such as drought, across a given portion of the grid (or more granularly, e.g., circuit, span, or asset). May include verification efforts, independent assessment by experts, and updates.
	Ignition probability mapping showing the probability of ignition along the electric lines and equipment	Development and use of tools and processes to assess the risk of ignition across regions of the grid (or more granularly, e.g., circuits, spans, or assets).
	Initiative mapping and estimation of wildfire and PSPS risk-reduction impact	Development of a tool to estimate the risk reduction efficacy (for both wildfire and PSPS risk) and risk-spend efficiency of various initiatives.
	Match drop simulations showing the potential wildfire consequence of ignitions that occur along the electric lines and equipment	Development and use of tools and processes to assess the impact of potential ignition and risk to communities (e.g., in terms of potential fatalities, structures burned, monetary damages, area burned, impact on air quality and greenhouse gas, or GHG, reduction goals, etc.).
B. Situational awareness and forecasting	Advanced weather monitoring and weather stations	Purchase, installation, maintenance, and operation of weather stations. Collection, recording, and analysis of weather data from weather stations and from external sources.
	Continuous monitoring sensors	Installation, maintenance, and monitoring of sensors and sensorized equipment used to monitor the condition of electric lines and equipment.
	Fault indicators for detecting faults on electric lines and equipment	Installation and maintenance of fault indicators.
	Forecast of a fire risk index, fire potential index, or similar	Index that uses a combination of weather parameters (such as wind speed, humidity, and temperature), vegetation and/or fuel conditions, and other factors to judge current fire risk and to create a forecast indicative of fire risk. A sufficiently granular index shall inform operational decision-making.
	Personnel monitoring areas of electric lines and equipment in elevated fire risk conditions	Personnel position within utility service territory to monitor system conditions and weather on site. Field observations shall inform operational decisions.

Category	Initiative	Definition
	Weather forecasting and estimating impacts on electric lines and equipment	Development methodology for forecast of weather conditions relevant to utility operations, forecasting weather conditions and conducting analysis to incorporate into utility decision-making, learning and updates to reduce false positives and false negatives of forecast PSPS conditions.
C. Grid design and system hardening	Capacitor maintenance and replacement program	Remediation, adjustments, or installations of new equipment to improve or replace existing capacitor equipment.
	Circuit breaker maintenance and installation to de-energize lines upon detecting a fault	Remediation, adjustments, or installations of new equipment to improve or replace existing fast switching circuit breaker equipment to improve the ability to protect electrical circuits from damage caused by overload of electricity or short circuit.
	Covered conductor installation	Installation of covered or insulated conductors to replace standard bare or unprotected conductors (defined in accordance with GO 95 as supply conductors, including but not limited to lead wires, not enclosed in a grounded metal pole or not covered by: a “suitable protective covering” (in accordance with Rule 22.8), grounded metal conduit, or grounded metal sheath or shield). In accordance with GO 95, conductor is defined as a material suitable for: (1) carrying electric current, usually in the form of a wire, cable or bus bar, or (2) transmitting light in the case of fiber optics; insulated conductors as those which are surrounded by an insulating material (in accordance with Rule 21.6), the dielectric strength of which is sufficient to withstand the maximum difference of potential at normal operating voltages of the circuit without breakdown or puncture; and suitable protective covering as a covering of wood or other non-conductive material having the electrical insulating efficiency (12kV/in. dry) and impact strength (20ft.-lbs) of 1.5 inches of redwood or other material meeting the requirements of Rule 22.8-A, 22.8-B, 22.8-C or 22.8-D.
	Covered conductor maintenance	Remediation and adjustments to installed covered or insulated conductors. In accordance with GO 95, conductor is defined as a material suitable for: (1) carrying electric current, usually in the form of a wire, cable or bus bar, or (2) transmitting light in the case of fiber optics; insulated conductors as those which are surrounded by an insulating material (in accordance with Rule 21.6), the dielectric strength of which is sufficient to withstand the maximum difference of potential at normal operating voltages of the circuit without breakdown or puncture; and suitable protective covering as a covering of wood or other non-conductive material having the electrical insulating efficiency (12kV/in. dry) and impact strength (20ft.-lbs) of 1.5 inches of redwood or other material meeting the requirements of Rule 22.8-A, 22.8-B, 22.8-C or 22.8-D.
	Crossarm maintenance, repair, and replacement	Remediation, adjustments, or installations of new equipment to improve or replace existing crossarms, defined as horizontal support attached to poles or structures generally at right angles to the conductor supported in accordance with GO 95.

Category	Initiative	Definition
	Distribution pole replacement and reinforcement, including with composite poles	Remediation, adjustments, or installations of new equipment to improve or replace existing distribution poles (i.e., those supporting lines under 65kV), including with equipment such as composite poles manufactured with materials reduce ignition probability by increasing pole lifespan and resilience against failure from object contact and other events.
	Expulsion fuse replacement	Installations of new and CALFIRE-approved power fuses to replace existing expulsion fuse equipment.
	Grid topology improvements to mitigate or reduce PSPS events	Plan to support and actions taken to mitigate or reduce PSPS events in terms of geographic scope and number of customers affected, such as installation and operation of electrical equipment to sectionalize or island portions of the grid, microgrids, or local generation.
	Installation of system automation equipment	Installation of electric equipment that increases the ability of the utility to automate system operation and monitoring, including equipment that can be adjusted remotely such as automatic reclosers (switching devices designed to detect and interrupt momentary faults that can reclose automatically and detect if a fault remains, remaining open if so).
	Maintenance, repair, and replacement of connectors, including hotline clamps	Remediation, adjustments, or installations of new equipment to improve or replace existing connector equipment, such as hotline clamps.
	Mitigation of impact on customers and other residents affected during PSPS event	Actions taken to improve access to electricity for customers and other residents during PSPS events, such as installation and operation of local generation equipment (at the community, household, or other level).
	Other corrective action	Other maintenance, repair, or replacement of utility equipment and structures so that they function properly and safely, including remediation activities (such as insulator washing) of other electric equipment deficiencies that may increase ignition probability due to potential equipment failure or other drivers.
	Pole loading infrastructure hardening and replacement program based on pole loading assessment program	Actions taken to remediate, adjust, or install replacement equipment for poles that the utility has identified as failing to meet safety factor requirements in accordance with GO 95 or additional utility standards in the utility's pole loading assessment program.
	Transformers maintenance and replacement	Remediation, adjustments, or installations of new equipment to improve or replace existing transformer equipment.
	Transmission tower maintenance and replacement	Remediation, adjustments, or installations of new equipment to improve or replace existing transmission towers (e.g., structures such as lattice steel towers or tubular steel poles that support lines at or above 65kV).
	Undergrounding of electric lines and/or equipment	Actions taken to convert overhead electric lines and/or equipment to underground electric lines and/or equipment (i.e., located underground and in accordance with GO 128).

Category	Initiative	Definition
	Updates to grid topology to minimize risk of ignition in HFTDs	Changes in the plan, installation, construction, removal, and/or undergrounding to minimize the risk of ignition due to the design, location, or configuration of utility electric equipment in HFTDs.
D. Asset management and inspections	Detailed inspections of distribution electric lines and equipment	In accordance with GO 165, careful visual inspections of overhead electric distribution lines and equipment where individual pieces of equipment and structures are carefully examined, visually and through use of routine diagnostic test, as appropriate, and (if practical and if useful information can be so gathered) opened, and the condition of each
	Detailed inspections of transmission electric lines and equipment	Careful visual inspections of overhead electric transmission lines and equipment where individual pieces of equipment and structures are carefully examined, visually and through use of routine diagnostic test, as appropriate, and (if practical and if useful information can be so gathered) opened, and the condition of each rated and recorded
	Improvement of inspections	Identifying and addressing deficiencies in inspections protocols and implementation by improving training and the evaluation of inspectors.
	Infrared inspections of distribution electric lines and equipment	Inspections of overhead electric distribution lines, equipment, and right-of-way using infrared (heat-sensing) technology and cameras that can identify "hot spots", or conditions that indicate deterioration or potential equipment failures, of electrical equipment.
	Infrared inspections of transmission electric lines and equipment	Inspections of overhead electric transmission lines, equipment, and right-of-way using infrared (heat-sensing) technology and cameras that can identify "hot spots", or conditions that indicate deterioration or potential equipment failures, of electrical equipment.
	Intrusive pole inspections	In accordance with GO 165, intrusive inspections involve movement of soil, taking samples for analysis, and/or using more sophisticated diagnostic tools beyond visual inspections or instrument reading.
	LiDAR inspections of distribution electric lines and equipment	Inspections of overhead electric transmission lines, equipment, and right-of-way using LiDAR (Light Detection and Ranging, a remote sensing method that uses light in the form of a pulsed laser to measure variable distances).
	LiDAR inspections of transmission electric lines and equipment	Inspections of overhead electric distribution lines, equipment, and right-of-way using LiDAR (Light Detection and Ranging, a remote sensing method that uses light in the form of a pulsed laser to measure variable distances).
	Other discretionary inspection of distribution electric lines and equipment, beyond inspections mandated by rules and regulations	Inspections of overhead electric transmission lines, equipment, and right-of-way that exceed or otherwise go beyond those mandated by rules and regulations, including GO 165, in terms of frequency, inspection checklist requirements or detail, analysis of and response to problems identified, or other aspects of inspection or records kept.

Category	Initiative	Definition
	Other discretionary inspection of transmission electric lines and equipment, beyond inspections mandated by rules and regulations	Inspections of overhead electric distribution lines, equipment, and right-of-way that exceed or otherwise go beyond those mandated by rules and regulations, including GO165, in terms of frequency, inspection checklist requirements or detail, analysis of and response to problems identified, or other aspects of inspection or records kept.
	Patrol inspections of distribution electric lines and equipment	In accordance with GO 165, simple visual inspections of overhead electric distribution lines and equipment that is designed to identify obvious structural problems and hazards. Patrol inspections may be carried out in the course of other company business
	Patrol inspections of transmission electric lines and equipment	Simple visual inspections of overhead electric transmission lines and equipment that is designed to identify obvious structural problems and hazards. Patrol inspections may be carried out in the course of other company business
	Pole loading assessment program to determine safety factor	Calculations to determine whether a pole meets pole loading safety factor requirements of GO 95, including planning and information collection needed to support said calculations. Calculations shall consider many factors including the size, location, and type of pole; types of attachments; length of conductors attached; and number and design of supporting guys, per D.15-11-021.
	Quality assurance / quality control of inspections	Establishment and function of audit process to manage and confirm work completed by employees or subcontractors, including packaging QA/QC information for input to decision-making and related integrated workforce management processes.
	Substation inspections	In accordance with GO 175, inspection of substations performed by qualified persons and according to the frequency established by the utility, including record-keeping.
E. Vegetation management and inspection	Additional efforts to manage community and environmental impacts	Plan and execution of strategy to mitigate negative impacts from utility vegetation management to local communities and the environment, such as coordination with communities to plan and execute vegetation management work or promotion of fire-
	Detailed inspections of vegetation around distribution electric lines and equipment	Careful visual inspections of vegetation around the right-of-way, where individual trees are carefully examined, visually, and the condition of each rated and recorded.
	Detailed inspections of vegetation around transmission electric lines and equipment	Careful visual inspections of vegetation around the right-of-way, where individual trees are carefully examined, visually, and the condition of each rated and recorded.
	Emergency response vegetation management due to red flag warning or other urgent conditions	Plan and execution of vegetation management activities, such as trimming or removal, executed based upon and in advance of forecast weather conditions that indicate high fire threat in terms of ignition probability and wildfire consequence.
	Fuel management and reduction of "slash" from vegetation management activities	Plan and execution of fuel management activities that reduce the availability of fuel in proximity to potential sources of ignition, including both reduction or adjustment of live fuel (in terms of species or otherwise) and of dead fuel, including "slash" from vegetation

Category	Initiative	Definition
		management activities that produce vegetation material such as branch trimmings and felled trees.
	Improvement of inspections	Identifying and addressing deficiencies in inspections protocols and implementation by improving training and the evaluation of inspectors.
	LiDAR inspections of vegetation around distribution electric lines and equipment	Inspections of right-of-way using LiDAR (Light Detection and Ranging, a remote sensing method that uses light in the form of a pulsed laser to measure variable distances).
	LiDAR inspections of vegetation around transmission electric lines and equipment	Inspections of right-of-way using LiDAR (Light Detection and Ranging, a remote sensing method that uses light in the form of a pulsed laser to measure variable distances).
	Other discretionary inspections of vegetation around distribution electric lines and equipment	Inspections of rights-of-way and adjacent vegetation that may be hazardous, which exceeds or otherwise go beyond those mandated by rules and regulations, in terms of frequency, inspection checklist requirements or detail, analysis of and response to problems identified, or other aspects of inspection or records kept.
	Other discretionary inspections of vegetation around transmission electric lines and equipment	Inspections of rights-of-way and adjacent vegetation that may be hazardous, which exceeds or otherwise go beyond those mandated by rules and regulations, in terms of frequency, inspection checklist requirements or detail, analysis of and response to problems identified, or other aspects of inspection or records kept.
	Patrol inspections of vegetation around distribution electric lines and equipment	Visual inspections of vegetation along rights-of-way that is designed to identify obvious hazards. Patrol inspections may be carried out in the course of other company business
	Patrol inspections of vegetation around transmission electric lines and equipment	Visual inspections of vegetation along rights-of-way that is designed to identify obvious hazards. Patrol inspections may be carried out in the course of other company business
	Quality assurance / quality control of vegetation inspections	Establishment and function of audit process to manage and confirm work completed by employees or subcontractors, including packaging QA/QC information for input to decision-making and related integrated workforce management processes.
	Recruiting and training of vegetation management personnel	Programs to ensure that the utility is able to identify and hire qualified vegetation management personnel and to ensure that both full-time employees and contractors tasked with vegetation management responsibilities are adequately trained to perform vegetation management work, according to the utility's wildfire mitigation plan, in addition to rules and regulations for safety.
	Remediation of at-risk species	Actions taken to reduce the ignition probability and wildfire consequence attributable to at-risk vegetation species, such as trimming, removal, and replacement.

Category	Initiative	Definition
	Removal and remediation of trees with strike potential to electric lines and equipment	Actions taken to remove or otherwise remediate trees that could potentially strike electrical equipment, if adverse events such as failure at the ground-level of the tree or branch breakout within the canopy of the tree, occur.
	Substation inspection	Inspection of vegetation surrounding substations, performed by qualified persons and according to the frequency established by the utility, including record-keeping.
	Substation vegetation management	Based on location and risk to substation equipment only, actions taken to reduce the ignition probability and wildfire consequence attributable to contact from vegetation to substation equipment.
	Vegetation inventory system	Inputs, operation, and support for centralized inventory of vegetation clearances updated based upon inspection results, including (1) inventory of species, (2) forecasting of growth, (3) forecasting of when growth threatens minimum right-of-way clearances (“grow-in” risk) or creates fall-in/fly-in risk.
	Vegetation management to achieve clearances around electric lines and equipment	Actions taken to ensure that vegetation does not encroach upon the minimum clearances set forth in Table 1 of GO 95, measured between line conductors and vegetation, such as trimming adjacent or overhanging tree limbs.
F. Grid operations and protocols	Automatic recloser operations	Designing and executing protocols to deactivate automatic reclosers based on local conditions for ignition probability and wildfire consequence.
	Crew-accompanying ignition prevention and suppression resources and services	Those firefighting staff and equipment (such as fire suppression engines and trailers, firefighting hose, valves, and water) that are deployed with construction crews and other electric workers to provide site-specific fire prevention and ignition mitigation during on-site work
	Personnel work procedures and training in conditions of elevated fire risk	Work activity guidelines that designate what type of work can be performed during operating conditions of different levels of wildfire risk. Training for personnel on these guidelines and the procedures they prescribe, from normal operating procedures to increased mitigation measures to constraints on work performed.
	Protocols for PSPS re-energization	Designing and executing procedures that accelerate the restoration of electric service in areas that were de-energized, while maintaining safety and reliability standards.
	PSPS events and mitigation of PSPS impacts	Designing, executing, and improving upon protocols to conduct PSPS events, including development of advanced methodologies to determine when to use PSPS, and to mitigate the impact of PSPS events on affected customers and local residents.
	Stationed and on-call ignition prevention and suppression resources and services	Firefighting staff and equipment (such as fire suppression engines and trailers, firefighting hose, valves, firefighting foam, chemical extinguishing agent, and water) stationed at utility facilities and/or standing by to respond to calls for fire suppression assistance.

Category	Initiative	Definition
G. Data governance	Centralized repository for data	Designing, maintaining, hosting, and upgrading a platform that supports storage, processing, and utilization of all utility proprietary data and data compiled by the utility
	Collaborative research on utility ignition	Developing and executing research work on utility ignition and/or wildfire topics in collaboration with other non-utility partners, such as academic institutions and research groups, to include data-sharing and funding as applicable.
	Documentation and disclosure of wildfire-related data and algorithms	Design and execution of processes to document and disclose wildfire-related data and algorithms to accord with rules and regulations, including use of scenarios for forecasting and stress testing.
	Tracking and analysis of near miss data	Tools and procedures to monitor, record, and conduct analysis of data on near miss events.
H. Resource allocation methodology	Allocation methodology development and application	Development of prioritization methodology for human and financial resources, including application of said methodology to utility decision-making.
	Risk reduction scenario development and analysis	Development of modelling capabilities for different risk reduction scenarios based on wildfire mitigation initiative implementation; analysis and application to utility decision-making.
	Risk spend efficiency analysis	Tools, procedures, and expertise to support analysis of wildfire mitigation initiative risk-spend efficiency, in terms of MAVF and/ or MARS methodologies.
I. Emergency planning and preparedness	Adequate and trained workforce for service restoration	Actions taken to identify, hire, retain, and train qualified workforce to conduct service restoration in response to emergencies, including short-term contracting strategy and implementation.
	Community outreach, public awareness, and communications efforts	Actions to identify and contact key community stakeholders; increase public awareness of emergency planning and preparedness information; and design, translate, distribute, and evaluate effectiveness of communications taken before, during, and after a wildfire, including Access and Functional Needs populations and Limited English Proficiency populations in particular.
	Customer support in emergencies	Resources dedicated to customer support during emergencies, such as website pages and other digital resources, dedicated phone lines, etc.
	Disaster and emergency preparedness plan	Development of plan to deploy resources according to prioritization methodology for disaster and emergency preparedness of utility and within utility service territory (such as considerations for critical facilities and infrastructure), including strategy for collaboration with Public Safety Partners and communities.
	Preparedness and planning for service restoration	Development of plans to prepare the utility to restore service after emergencies, such as developing employee and staff trainings, and to conduct inspections and remediation necessary to re-energize lines and restore service to customers.

Category	Initiative	Definition
	Protocols in place to learn from wildfire events	Tools and procedures to monitor effectiveness of strategy and actions taken to prepare for emergencies and of strategy and actions taken during and after emergencies, including based on an accounting of the outcomes of wildfire events.
J. Stakeholder cooperation and community engagement	Community engagement	Strategy and actions taken to identify and contact key community stakeholders; increase public awareness and support of utility wildfire mitigation activity; and design, translate, distribute, and evaluate effectiveness of related communications. Includes specific strategies and actions taken to address concerns and serve needs of Access and Functional Needs populations and Limited English Proficiency populations in particular.
	Cooperation and best practice sharing with agencies outside CA	Strategy and actions taken to engage with agencies outside of California to exchange best practices both for utility wildfire mitigation and for stakeholder cooperation to mitigate and respond to wildfires.
	Cooperation with suppression agencies	Coordination with CALFIRE, federal fire authorities, county fire authorities, and local CALFIRE authorities to support planning and operations, including support of aerial and ground firefighting in real-time, including information-sharing, dispatch of resources, and dedicated staff.
	Forest service and fuel reduction cooperation and joint roadmap	Strategy and actions taken to engage with local, state, and federal entities responsible for or participating in forest management and fuel reduction activities; and design utility cooperation strategy and joint stakeholder roadmap (plan for coordinating stakeholder efforts for forest management and fuel reduction activities).

5.4 Methodology for enterprise-wide safety risk and wildfire-related risk assessment

The fundamental inputs outlining wildfire risk are explored in Section 3, but relate substantially to the limitation of fault events that could result in ignition, and these risks vary with time of year, largely due to the impactful role that environment plays in sustaining ignitions that lead to wildfire. Additionally, PacifiCorp actively participated in the development of the California Fire Threat map and leveraged that process, which aligns with other utilities who participated in the development, to identify specific geographic areas subject to elevated risk. PacifiCorp leveraged this assessment to inform inspection, vegetation management, correction timeframes, and prioritized hardening efforts. This assessment is consistent with other utilities.

Outside of the California Fire Threat map development, the company's 2018 GRC established a generalized approach for enterprise-wide safety risk, and as the assessment of the case evolved, it coincided fortuitously with the establishment of newly strengthened wildfire mitigation regulations as adopted through General Orders 95, 165 and 166. As a small multi-jurisdictional utility, PacifiCorp was not required to develop a RAMP (Risk Assessment Model Program) which includes at its core elements quantifying risk spend efficiencies; it relies upon substantial data and analytical methods which may be cost-burdensome for the small customer base it serves to fund. Thus the SMJUs were directed to provide data rationalizing investment that demonstrated that the underlying principles of cost versus risk efficiency existed generally through the prioritization of its programs. In its rate case and supported through data requests, the company met that requirement. However, the establishment of SB901 and now WSD-directed WMPs expands further this effort on the company's part, specifically relating to wildfire risk.

5.5 Planning for workforce and other limited resources

In the event workforce or other resources are limited, PacifiCorp is a member of several mutual assistance groups which would provide either manpower, resources or logistical assistance. Mutual assistance partners may also release contract crews from duties on their property to aid in any response we may request. PacifiCorp has historically both sent and received mutual assistance for responses which were beyond the local capability with successful results each time. These plans are able to be immediately implemented without need for additional negotiation thus providing resources as soon as logistically possible, usually less than 24 hours. Additional details are included in Section 5.3.9.

As included in Section 5 Part C, one area of concern that continues to be a challenge regarding the successful implementation of PacifiCorp's multi-year WMP, is the availability of qualified resources and materials. While PacifiCorp maintains its commitment to deliver the company's wildfire mitigation programs and projects as proposed, it is critical to recognize that, as these projects and programs are subject to continuous evaluation in an effort to drive continuous improvement, specifics may need to change and adapt to moving market conditions, resource constraints, and lessons learned. PacifiCorp intends to keep a close eye on these potential changes, which the company will incorporate into future Off-Ramp filings.⁵⁰ Furthermore, as included in Section 5.3.3, PacifiCorp recently formed a Wildfire Mitigation Delivery Project Management Office within the transmission and distribution operations department and assigned a Wildfire Mitigation Delivery Director to lead the effort. The Wildfire Mitigation Implementation PMO will be responsible for planning, tracking, completion, and quality assurance of PacifiCorp's grid design and system hardening programs. While this department remains in its early stages and is not yet fully formed, the office intends to explore and develop a quality assurance process throughout the life cycle of the programs, which would include the procurement of critical resources and the identification of any shortages regarding the construction phases of applicable programs.

⁵⁰ As required in Decision 19-05-036.

5.6 Expected outcome of a 3-year plan

5.6.1 Planned utility infrastructure construction and upgrades

PacifiCorp outlined in its 2019 WMP that it intended to implement a wide range of situational assessment, asset hardening, operational strategies and inspection/correction programs, all specifically tuned to minimize the impact of wildfire that could be the result of utility ignitions. The details of each of these programs were included in Tables 22-30, with the overall program targets summarized in Table 4 of Section 2.5. To reflect the company's planned utility infrastructure construction and upgrades, see GIS data attached in Appendix 6.5 and the summary below.

PacifiCorp calculates cost of service regarding all applicable customers during rate case proceedings. These costs are generally socialized across the system at a level greater than per circuit or per customer, making location specific cost of service calculations challenging to create and potentially mis-leading if used to inform decisions or analysis. Therefore, it was challenging for PacifiCorp to provide the level of detail requested in this section. However, where appropriate, PacifiCorp has provided infrastructure construction and upgrades planned over the next three years in the summary below.

Program Details			Total Program Targets		3-yr Planned Outcome		Underlying assumptions
Program	Initiative	Duration	Total Planned Unit(s)	Anticipated Completion (EOY)	Unit(s)	Cumulative Percent Complete of Total Plan (%)	
Situational Awareness	Weather Station Installation	Multi-year (4 yr)	35 stations	2022	20 stations	80%	See Section 5.3.2.1
Asset management and inspections	Enhanced transmission inspections using IR/alternate technologies	Single pilot project (2 yr)	1 Pilot Project	2020	1 Pilot Project	100%	See Section 5.3.4.5
	Complete planned inspections, including additional HFTD inspections	Annual program/target	3,311 equivalent line miles	Annual / on-going	3,311 equivalent line miles	100%	See Section 5.3.4.3
	Implement LiDAR inspection pilot project for distribution and transmission lines	Single pilot project (2 yr)	1 Pilot Project	2020	1 Pilot Project	100%	See Section 5.3.4.7

Program Details			Total Program Targets		3-yr Planned Outcome		Underlying assumptions
Program	Initiative	Duration	Total Planned Unit(s)	Anticipated Completion (EOY)	Unit(s)	Cumulative Percent Complete of Total Plan (%)	
System Hardening:	Installation of Covered Conductor	Multi-year (5 yr)	221 line-miles	2023	147 line-miles	78%	See Section 5.3.3.3
	Replacement of Cu Conductor	Multi-year (5 yr)	53 line miles	2023	42 line miles	79%	See Section 5.3.3.18
	Installation of System Automation Equipment	Multi-year (4 yr)	68 projects	2022	68 projects	100%	See Section 5.3.3.9
	Proactive Wood Pole Replacement	Multi-year (5 yr)	4,000	2023	1,149 poles	85%	See Section 5.3.3.6
Vegetation Management and Inspections:	Perform annual inspections on all lines in the HFTD	Annual program/target	1,170 line miles	Annual / on-going	1,170 poles	100%	See Section 5.3.5.2 & Section 5.3.5.3
Vegetation Management and Inspections:	Implement radial pole clearing program	Annual program/target	15,060 poles	Annual / on-going	15,060 poles	100%	See Section 5.3.5.9

The data sets required to populate Table 31 as requested are not readily available or representative of typical data sets used by the company to operate the system. Additionally, PacifiCorp does not have any experience in forecasting the type of conditions, such as weather and environmental conditions, that are required to predict trends in ignition probability drivers and, therefore, found it challenging to populate the table as requested. Furthermore, it is challenging to apply system wide data sets to location specific projects and provide quantitative future values. PacifiCorp does anticipate a general reduction in utility-related fault events within PacifiCorp's service territory during fire season within the HFTD after the implementation of the company's WMP as described in Section 4.3. While the company will be in a position to be less vulnerable to utility operational events that could result in ignition and could threaten communities it serves upon implementation of these proposed mitigation programs, PacifiCorp was not able to populate the table below with specific values.

Table 31: Change in drivers of ignition probability taking into account planned initiatives, for each year of plan

Incident type by ignition probability driver	Detailed risk driver	Are near missed tracked?	Number of incidents per year			Average percentage likelihood of ignition per incident			Number of ignitions per year		
			2020	2021	2022	2020	2021	2022	2020	2021	2022
Contact from object	Animal contact	n	No discrete data available; General reducing trend anticipated specific to fire season within PacifiCorp's service territory within the HFTD								
	Balloon contact	n									
	Other	n									
	Unknown	n									
	Veg. contact	n									
	Vehicle contact	n									
Contamination		n	No discrete data available; General reducing trend anticipated specific to fire season within PacifiCorp's service territory within the HFTD								
All types of equipment/facility failure	All types	n	No discrete data available; General reducing trend anticipated specific to fire season within PacifiCorp's service territory within the HFTD								
	Conductor	n									
	Crossarm	n									
	Fuse	n									
	Insulator	n									
	Lightning arrestor	n									
	Other	n									
	Pole	n									
	Sectionalizer	n									
	Splice/clamp/connector	n									
	Switch	n									
	Transformer	n									
	Voltage regulator	n									
Normal Operations		n	No discrete data available; General reducing trend anticipated specific to fire season within PacifiCorp's service territory within the HFTD								
Other		n	No discrete data available; General reducing trend anticipated specific to fire season within PacifiCorp's service territory within the HFTD								
Unknown		n	No discrete data available; General reducing trend anticipated specific to fire season within PacifiCorp's service territory within the HFTD								
Vandalism/Theft		n	No discrete data available; General reducing trend anticipated specific to fire season within PacifiCorp's service territory within the HFTD								

Incident type by ignition probability driver	Detailed risk driver	Are near missed tracked?	Number of incidents per year			Average percentage likelihood of ignition per incident			Number of ignitions per year		
			2020	2021	2022	2020	2021	2022	2020	2021	2022
Wire-to-wire contact		n	No discrete data available; General reducing trend anticipated specific to fire season within PacifiCorp's service territory within the HFTD								
Contact from 3rd party		n	No discrete data available; General reducing trend anticipated specific to fire season within PacifiCorp's service territory within the HFTD								

5.6.2 *Protocols on Public Safety Power Shut-off*

The following subsections describe PacifiCorp's protocols on Public Safety Power Shut-off (PSPS or de-energization), including:

5.6.2.1 *Strategy to minimize public safety risk during high wildfire risk conditions and details of the considerations, including but not limited to list and description of community assistance locations and services provided during a de-energization event.*

PacifiCorp's strategy to minimize the public safety risk during high wildfire risk conditions begins with proper planning and clear communication and encompasses elements from many of the programs already included in this plan.

As described in Section 5.3.10.1, PacifiCorp participates in various regulatory proceedings, town hall meetings, and open house events to engage other industry leaders, community leaders and members, and local emergency response management organization. These events focus on a range of aspects of PacifiCorp's wildfire emergency planning and preparedness programs, including communication protocols, notification protocols, and resource coordination efforts, including the implementation of potential PSPS events.

Furthermore, PacifiCorp uses a multi-faceted effort to communicate information regarding wildfire prevention and response to customers and communities. Communication methods include the following: targeted radio public service announcements; social media posts on Facebook and Twitter; informative banners on website homepage, wildfire safety landing page on website; targeted bill messages; press releases posted to our website and distributed to local media; news articles for local chamber publications; prepared talking points for regional business managers; pre-determined outreach to local community authorities and organizations to participate in prevention and preparedness focused town halls; and live informative Facebook events.

Finally, as a part of PacifiCorp's standard operating procedures and resource structure, Regional Business Managers, PacifiCorp employees that live and work within the communities served, typically lead PacifiCorp's involvement in these initiatives to ensure the community is being engaged with consistently regarding all relevant programs, including wildfire mitigation programs.

In preparation of a PSPS event, PacifiCorp leverages the notification process and protocols included in Section 4.4.3 which includes additional notification to vulnerable customers as well as public safety authorities, local municipalities, and emergency responders. These notifications provide affected parties with additional time to prepare for a potential PSPS event in order to mitigate the impact.

During a PSPS event, PacifiCorp leverages the communication protocols included in Section 4.4.3 as well as general emergency communication and protocols included in Section 5.3.9 to ensure customers and communities have up to date and accurate information that informs good decision making. Furthermore, PacifiCorp offers various customer care services during an emergency as described in Section 5.3.9.

Additionally, during a PSPS event PacifiCorp partners with local support organizations (Red Cross, etc.) to coordinate, setup and communicate the location of any community shelters, if required based on the anticipated duration of the event. Services at these locations would include company personnel to respond to inquiries regarding the PSPS event and provide a charging station for mobile devices. Information about these shelters would be posted on the PacifiCorp website and shared with local emergency services.

Furthermore, the totality of the company's wildfire mitigation programs includes, as a component, improvements to mitigate or reduce PSPS events. While the company's many wildfire mitigation programs, such as installation of covered conductor, installation and operation of weather stations, or enhanced inspections and corrections, are designed and focused to reduce the overall wildfire risk, PacifiCorp anticipates that, as these programs evolve, an additional benefit may be realized through the reduction of potential PSPS events. Further details regarding PacifiCorp's grid topology improvements to mitigate or reduce PSPS events are included in Section 5.3.3.8.

5.6.2.2 Outline of tactical and strategic decision-making protocol for initiating a PSPS/de-energization (e.g., decision tree).

Evident in all aspects from the identification of PSPS candidates to the determination of execution of a PSPS event, PacifiCorp's PSPS program and protocols focus on ensuring public safety while maintaining an effective balance between wildfire risk reduction and impact to communities and customers.

For example, as opposed to applying a PSPS to all of PacifiCorp's HFTD service territory, PacifiCorp incorporated location specific grid topology and configuration, terrain, fire history, presence of wildland urban interface, defensible space, impacts to customers and facilities, fuel characteristics and weather into the existing fire risk mapping designations to identify specific areas within each Tier 3 or Tier 3 adjacent location where a public safety power shut-off should be considered. Furthermore, these geographic locations were further subdivided based on grid topology and risk factors to reduce the impact of any single PSPS event in a given area, resulting in five discreet areas. These five discreet areas, where applicable, were further subdivided into approximately three sub-zones, each with different classification of risk and, therefore, different, escalating thresholds for activation.

Furthermore, PacifiCorp takes a strategic and methodical approach in determining when and where to implement a PSPS event. The company leverages weather predictions to prepare for a potential PSPS event but evaluate live data, and to the extent available, local data to make any final determinations. The specific triggers and measurements as well as monitoring systems used to inform a potential PSPS event initiation and duration are included in Section 4.4.

5.6.2.3 Strategy to provide for safe and effective re-energization of any area that was de-energized due to PSPS protocol.

To mitigate the risk of issues being present on a circuit that is ready to be re-energized following a PSPS protocol, field operations performs a line patrol on de-energized sections of the circuit. This patrol is completed just before re-energizing the line. Typically, this type of line patrol does not

involve a close inspection of any particular facility; instead, it is a quick visual assessment specifically targeted to identify obvious foreign objects which may have fallen into the line during restoration work or PSPS event.

5.6.2.4 Company standards relative to customer communications, including consideration for the need to notify priority essential services –critical first responders, public safety partners, critical facilities and infrastructure, operators of telecommunications infrastructure, and water utilities/agencies. This section, or an appendix to this section, shall include a complete listing of which entities the electrical corporation considers to be priority essential services. This section shall also include description of strategy and protocols to ensure timely notifications to customers, including access and functional needs populations, in the languages prevalent within the utility’s service territory.

As included in Section 4.4, in the event of Proactive De-energization, identified personnel will receive an email notification from System Operations. The email will include the current or forecasted weather conditions triggering an event, the affected area, and the date and time of the event. The goal is to begin notifying customers 48 hours in advance of a potential de-energization event. If this is not possible due to weather or any other changing conditions, the notification process will begin as soon as possible.

Customer Communications

- The list of affected customers (generated by System Operations from the impacted circuits noted in the De-Energization Event Plan) is sent to the Customer Contact Center
- Using this list, the contact center will begin sending notifications utilizing preapproved templates for each state of the notification process.

During the PSPS event, customers will receive updates to the status of the outage. The trigger for an update will be when the status of the outage or the estimated time of restoration changes. If a previously noticed proactive de-energization event is cancelled, customers will receive a cancellation notice.

Method of Notification

- Customers will be contacted by text, email, or phone call based on their preference. If no preference is selected, a phone call will be made to the primary phone number on the account.
- Notifications for a proactive de-energization event are exempted from the 48 hour notification prior to a planned outage as required under Rule 25 under both the Force Majeure and Safety clauses listed under approved exemptions.
- Messages will be posted on social media, local media, and press release.

Timeframe for Communications	Type of Notification	Customer Service/Communications
48 hours before De-Energization	Conditional	48 hour notice to customers (including critical priority customers) Emergency response site goes live Notification posted on website, Social Media and emergency response site Mobilize local authorities for a live stream on Facebook Issue a press statement/release Mandatory manager call for local employees impacted
2 hours	Updated Conditional	2 hour notice to customers (including critical priority customers) Notification posted on website, Social Media and emergency response site Mobilize local authorities for a live stream on Facebook Issue a press statement/release Mandatory manager call for local employees impacted
1 hour	Imminent	Mobilize local authorities for a live stream on Facebook Mandatory manager call for local employees impacted
De-Energization	Immediate	Notification posted on website, Social Media and emergency response site Mobilize local authorities for a live stream on Facebook Issue a press statement/release
Re-Energization	Immediate	Notice of cancellation customers (including critical priority customers) Notification posted on website, Social Media and emergency response site Issue a press statement/release

Outreach in Advance of the Implementation of a Public Safety Power Shut-Off

PacifiCorp provides information regarding proactive de-energization on the public website, including the following:

- Actions taken to harden the system to reduce risk,
- Monitoring conditions,
- Criteria for triggering a PSPS event,
- Map of tiers in California,
- Notification before, during, and at the conclusion on an event,
- Restoration information,
- PSPS candidate zones,
- PSPS zone status and forecasting leading up to and during a PSPS event, and
- Available community resources.

Additionally, PacifiCorp intends to communicate through additional methods such as social media, twitter, Facebook, pamphlets, and radio as described above as well as Section 5.3.10.1.

Access and Functional Needs Customers

Known vulnerable customers (medical conditions, etc.) will receive additional outreach from the company requesting they evaluate the safety of their situations and consider a back-up plan in case of a shut off or any emergency outage. PacifiCorp also refers to these customers as AFN, or access and functional needs customers, identified through the process described in Section 2.7.

Public Safety Authorities, Local Municipalities, Emergency Responders

The company's Emergency Manager will notify the appropriate local agencies based on the PSPS zone that was activated. PacifiCorp will work with agencies to minimize the impact of de-energization as much as possible and fully communicate the impacted areas and expected duration. The notification will be documented for reporting purposes after the event has ended.

List of Priority Essential Services

PacifiCorp provided critical facilities and AFN customers as part of the GIS data set submission in Section 6.0. At the guidance of the WSD, specific customer data has not been included. However, a general list and summary of categorical critical facilities and AFN customers is included in the tables below.

PSPS Zone Name	Critical Facilities	AFN Customers
Happy Camp	25	0
Weed	41	0
Mt. Shasta	88	2
Dunsmuir	23	1
Snowbrush	8	0

An additional breakdown of the critical facilities included in each PSPS candidate zone is included below.

PDZ	Critical Facility Type	Total
Dunsmuir	Air/water/solid waste	3
	Elementary & secondary schools	3
	Fire protection	1
	Police	1
	Radio and communication equipment	11
	Sewerage	1
	Water supply	3
Dunsmuir Total		23
Happy Camp	Air/water/solid waste	5
	Child day care	1
	Elementary & secondary schools	3
	Fire protection	1
	Police	1
	Radio and communication equipment	7
	Residential care	2
	Sewerage	5

PDZ	Critical Facility Type	Total
Happy Camp Total		25
Mt Shasta	Air/water/solid waste	1
	Child day care	2
	Elementary & secondary schools	17
	Fire protection	6
	Gen med hospital	4
	Police	3
	Radio and communication equipment	27
	Residential care	1
	Sewerage	6
	Skilled nursing facility	1
	Specialty hospital	1
	Water supply	19
Mt Shasta Total		88
Snowbrush	Radio and communication equipment	8
Snowbrush Total		8
Weed	Air/water/solid waste	1
	Child day care	1
	Colleges, universities	4
	Elementary & secondary schools	4
	Fire protection	2
	Gen med hospital	1
	Jail	1
	Radio and communication equipment	22
	Sewerage	1
	Skilled nursing facility	1
	Water supply	3
Weed Total		41

5.6.2.5 Protocols for mitigating the public safety impacts of these protocols, including impacts on first responders, health care facilities, operators of telecommunications infrastructure, and water utilities/agencies.

PacifiCorp's strategy to mitigate public safety risk during high wildfire risk conditions includes mitigating impacts on first responders, health care facilities, operators of telecommunications infrastructure, and water utilities/agencies. Similar to the identification of vulnerable customers, PacifiCorp identifies critical customers that have the potential to be affected by a PSPS event, such as hospitals, other utilities, and critical infrastructure for the community. The presence of these critical facilities is not only incorporated into the overall identification of potential PSPS candidates but also informs notification and communication protocols in preparation for and during a PSPS event.

6. Utility GIS Attachments

The requested GIS layers have been electronically included in this filing as attachments.

6.1 Recent weather patterns

The following table includes the requirements and GS data naming convention included in Attachment 6.1

GIS Naming Convention			Properties from Tables in Section 2.7		
Attachment location	GIS File-geodatabase file name	GIS Layer Name	Layer name	Measurements	Units
6.1	Data_Table8.gdb	WWA_PAC_FW_2015-2019_Durations_Grid	Recent weather patterns	Average annual number of Red Flag Warning days per square mile across service territory	Area, days, square mile resolution
	Data_Table8.gdb	Ave95_99th_PercentileWind_Grid		Average 95 th and 99 th percentile wind speed and prevailing direction (actual)	Area, miles per hour, at a square mile resolution or better, noting where measurements are actual or interpolated

6.2 Recent drivers of ignition probability

The following table includes the requirements and GS data naming convention included in Attachment 6.2

GIS Naming Convention			Properties from Tables in Section 2.7		
Attachment location	GIS File-geodatabase file name	GIS Layer Name	Layer name	Measurements	Units
6.2	Data_Table8.gdb	Ignition_Probability_Grid	Recent drivers of ignition probability	Date of recent ignitions categorized by ignition probability driver	Point, GPS coordinate, days, square mile resolution

6.3 Recent use of PSPS

The following table includes the requirements and GS data naming convention included in Attachment 6.3.

GIS Naming Convention			Properties from Tables in Section 2.7		
Attachment location	GIS File-geodatabase file name	GIS Layer Name	Layer name	Measurements	Units
6.3	N/A	N/A	Recent use of PSPS	Duration of PSPS events and area of the grid affected in customer hours per year	Area, customer hours, square mile resolution

6.4 Current baseline state of service territory and utility equipment

The following table includes the requirements and GS data naming convention included in Attachment 6.4.

GIS Naming Convention			Properties from Tables in Section 2.7		
Attachment location	GIS File-geodatabase file name	GIS Layer Name	Layer name	Measurements	Units
6.4	Data_Table9MapLayer1.gdb	HFTD_Grid	Current baseline state of service territory and utility equipment	Non-HFTD vs HFTD (Zone 1, Tier 2, Tier 3) regions of utility service territory	Area, square mile resolution per type
		LANDUSE_Grid		Urban vs. rural vs. highly rural regions of utility service territory	Area, square mile resolution per type
		WUI_Grid		WUI regions of utility service territory	Area, square mile resolution
		Critical_Facilities		Number and location of critical facilities	Point, GPS coordinate
		Customer_Grid		Number and location of customers	Area, number of people, square mile resolution
		CustomerAFN_Grid		Number and location of customers belonging to access and functional needs populations functional needs populations	Area, number of people, square mile resolution
		Distirbution_Line_OH		Overhead transmission lines	Line, quarter mile resolution
		Transmission_Line		Overhead distribution lines	Line, quarter mile resolution
		Distribution_Sub & Transmission_Sub		Location of substations	Point, GPS coordinate
		Weather_Stations		Location of weather stations	Point, GPS coordinate
		All_poles		All utility assets by asset type, model, age, specifications, and condition	Point, GPS coordinate

6.5 Location of planned utility equipment additions or removal

The following table includes the requirements and GS data naming convention included in Attachment 6.5.

GIS Naming Convention			Properties from Tables in Section 2.7		
Attachment location	GIS File-geodatabase file name	GIS Layer Name	Layer name	Measurements	Units
6.5	Data_Table9MapLayer2.gdb	Lines_HFTD	Location of planned utility equipment additions or removal	Non-HFTD vs HFTD (Zone 1, Tier 2, Tier 3) regions of utility service territory	Line, quarter mile resolution
		Lines_LandUse		Urban vs. rural vs. highly rural regions of utility service territory	Line, quarter mile resolution
		Lines_LandUse00		WUI regions of utility service territory	Line, quarter mile resolution
		Transmission_Line		Circuit miles of overhead transmission lines	Line, quarter mile resolution
		Distirbution_Line		Circuit miles of overhead distribution lines	Line, quarter mile resolution
		Substation		Location of substations	Point, GPS coordinate

6.6 Planned 2020 WMP initiative activity by end-2022

The following table includes the requirements and GS data naming convention included in Attachment 6.6.

GIS Naming Convention			Properties from Tables in Section 2.7		
Attachment location	GIS File-geodatabase file name	GIS Layer Name	Layer name	Measurements	Units
6.6 ⁵¹	Data_Table9MapLayer3.gdb	Distribution Line/Substations	Planned 2020 WMP initiative activity per year	Location of 2020 WMP initiative activity for each activity as planned to be completed by the end of each year of the plan term	Line, quarter mile resolution

⁵¹ Assumed to be an error and interpreted as 6.6 as there was no 7.6 in the template.