Exh. ALB-1T
Docket UE-19____
Witness: Allen L. Berreth

BEFORE THE WASHINGTON

UTILITIES AND TRANSPORTATION COMMISSION

WASHINGTON UTILITIES AND TRANSPORTATION COMMISSION, Complainant, v. PACIFICORP dba PACIFIC POWER & LIGHT COMPANY Respondent.	Docket UE-19____

PACIFICORP

DIRECT TESTIMONY OF ALLEN L. BERRETH

December 2019

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ATTACHED EXHIBITS

Q. Please state your name, business address, and present position with PacifiCorp.

A. My name is Allen L. Berreth and my business address is 825 NE Multnomah Street, Suite 1700, Portland, Oregon 97232. I am currently employed as Director of Delivery Assurance, Transmission and Distribution Operations. I am testifying for PacifiCorp dba Pacific Power & Light Company (PacifiCorp or the Company).

QUALIFICATIONS

Q. Please describe your education and professional experience.

A. I have a Bachelor of Science degree in Electrical Engineering with a focus in electric power systems from the University of Idaho and a Masters of Business Administration from Utah State University. I have been Director of Delivery Assurance for PacifiCorp since June 2012. In this position, my responsibilities include asset strategy and performance, investment delivery, GIS, estimating support, and wildfire mitigation planning. Before my current position, I have held positions in work planning, business improvement, and field engineering since joining PacifiCorp in 1998.

PURPOSE OF TESTIMONY

Q. What is the purpose of your testimony?

A. The purpose of my testimony is to describe PacifiCorp's capital investment in wildfire mitigation efforts in Washington and the rebuilding of assets after a wildfire event impacted a transmission line on the PacifiCorp system. My testimony demonstrates that PacifiCorp is making prudent decisions related to the mitigation of wildfire risk, which is a benefit to all PacifiCorp customers. These benefits include

identification of catastrophic fire risk to increase safety and mitigate the impact to customer property, Company facilities, and the cost of rebuilding.

OVERVIEW OF INVESTMENTS INCLUDED IN FILING

Q. What specific system investments are you addressing in this case?

A. I address PacifiCorp's wildfire mitigation and wildfire transmission line rebuilding investments included in rate base in this proceeding. Specifically, I address the following projects:

- Washington wildfire mitigation projects on the Nile feeder (4Y1) Northeast of Yakima, along the Nile canyon, as shown in the map attached in Exhibit No. ALB-2;
- Delta fire damaged transmission facilities rebuild (Line 14 and Line 2), as shown in the map attached in Exhibit No. ALB-3.

Q. What are the projected costs associated with these investments and their associated in-service dates?

A. The projected total-company costs and in-service dates associated with these projects are listed below. These amounts include costs associated with engineering, project management, materials and equipment, construction, right-of-way, and an allowance for funds used during construction. These costs are also shown in the testimony and exhibits of Ms. Shelley E. McCoy (Exhibit No. SEM-1T). The in-service dates are based on the best available information at the time of preparing this general rate case.

- Washington wildfire mitigation projects on the Nile feeder (4Y1) will be completed by December 2020 for a total investment of $2.7 million.

- Delta fire damaged transmission facilities rebuild (Line 14 and Line 2) was completed and placed in service in March 2019 for a total-company investment of $36.1 million.

WASHINGTON WILDFIRE MITIGATION PROJECTS

Q. Have the risks associated with wildfires changed in PacifiCorp's service territories, including Washington?

A. Yes. There has always been some degree of wildfire risk across PacifiCorp's territories, including in Washington. This risk is inherent to operating an electric utility, and is elevated for utilities in the western United States where climates are arid yearlong in some areas, or seasonally in others. However, the frequency, severity, and costs of catastrophic wildfires are increasing across the west. California, and its recent experiences with catastrophic and tragic wildfires, has resulted in an even greater focus on wildfire risk mitigation by public utilities. The widely publicized impact of these fires on California's public utilities has led to an increased focus on wildfire risks in PacifiCorp's service territories in California and other states, including Washington.

This increased risk and focus on wildfires has had measurable impacts on the insurance market as "insurers have become concerned about the growing liability risks to utilities, and prices have increased substantially"[1]

[1] CAROLYN KOUSKY, KATHERINE GREIG & BRETT LINGLE, *Financing Third Party Wildfire Damages: Options for California's Electric Utilities*, WHARTON RISK MANAGEMENT AND DECISION PROCESS CENTER (Feb. 2019) *available at* https://riskcenter.wharton.upenn.edu/wp-content/uploads/2019/02/Financing-Third-Party-Wildfire-Damages-1.pdf.

Q. How is PacifiCorp addressing this increased risk profile?

A. PacifiCorp has taken several actions to respond to increased wildfire risks. PacifiCorp identified key goals to help inform its wildfire mitigation approach: 1) minimize the risk of wildfires from PacifiCorp equipment; 2) promptly address any problems attributed to PacifiCorp equipment if they do occur; 3) be prepared to address wildfires from other sources; and 4) respond when wildfire puts utility equipment at risk. PacifiCorp took these goals and engaged in an extensive modeling process to develop a risk-based approach to achieving them. This risk-based approach facilitates smart investments targeted to places on the system where they will have the most impact, and ensures that PacifiCorp's human capital is also deployed in areas where they will have the greatest impact.

Q. Please described how the risk of wildfire has been modeled in Washington.

A. PacifiCorp recognizes that if certain weather and fuel conditions are present, a disruption of normal operations on the electrical network, called a "fault" in the industry, can result in the ignition of a fire. Under certain weather conditions and in the vicinity of wildland fuels, such an ignition can grow into a harmful wildfire, potentially even growing into a catastrophic fire causing great harm to people and property. PacifiCorp's risk analysis explores fire history, the recorded causes of the fires, the acreage impact of the fires, and when in the year the fires typically occur, and then armed with that information, lays out the logic for a risk-informed method to strategically address utility wildfire risks. PacifiCorp patterned its wildfire risk modeling after the methodology developed after a long and iterative process in California. To take advantage of the experience learned through that process,

PacifiCorp engaged REAX Engineering Inc., a fire-science engineering firm, to identify areas of elevated wildfire risk. PacifiCorp designated such areas as Fire High Consequence Areas (FHCA).

The data and process used are as follows:

1) Topography of the land, including elevation, slope, and aspect;

2) Fuel data which quantify fuel loading, fuel particle size, and other quantities needed by fire models to calculate the rate of spread;

3) Weather Research and Forecasting (WRF), which is a hybrid of weather modeling and surface weather observations (including temperature, relative humidity, wind speed/direction, and precipitation);

4) Historical fire weather days spanning the period from January 1, 1979, through December 31, 2017;

5) Estimated live fuel moisture;

6) Ignition modeling, using Monte Carlo simulated ignition scenarios; and

7) Fire spread modeling.

A final confirmation exercise was completed by evaluating the FHCA against historical fire perimeters (which are the final recorded footprint for any given fire), existing Company facility equipment, and the Company's service territories. The resulting FHCA, with wildfire perimeters, and PacifiCorp's service territories are shown in Exhibit No. ALB-4. In general, if population density did not correlate to fuel and fire weather history, it would not be considered a candidate for FHCA designation.

Q. Based on this wildfire risk modeling, what components of PacifiCorp's system have been identified as existing in a FHCA?

A. Based on the wildfire risk modeling conducted in PacifiCorp's Washington service

area, the Nile distribution feeder (4Y1) has been identified as having sections inside the FHCA and is a candidate for wildfire mitigation project investments.

Q. What are the specific wildfire mitigation projects planned for the Nile Feeder?

A. Table 1 below describes the specific wildfire mitigation projects planned for the Nile feeder, including the anticipated units and cost breakdown of activity.

TABLE 1

Focus Area	Description	Units	Unit Cost	Total
Distribution Pole Replacement	Accelerated replacement of wooden poles within the FHCA in addition to testing-based replacement programs to proactively prevent failures, diversify the vintages, and reduce wildfire risk due to pole failures	35 poles	$6,000 per pole	$210,000
Overhead Fuse Replacement	Replacement of all pole mounted/overhead expulsion fuses within the FHCA with non-expulsion fuses	34 fuses	$1,300 per fuse	$44,200
Re-Conductor with Insulated Cable	Reconductor single phase overhead distribution with insulated cable to reduce susceptibility to incidental contact	10 line-miles	$50,000 per line mile	$513,888
Spacer Cable Installation	Installation of spacer cable on overhead three phase distribution poles to reduce susceptibility of phase-to-phase contact and increase structural resilience	9 line-miles	$200,000 per line mile	$1,884,397
				$2,652,484

Q. How do these specific projects reduce the threat of wildfire in the Nile Canyon?

A. These projects focus on reducing the potential of the power system being the source of ignition for a catastrophic fire by creating a spark during a fault event. The primary way this is done is by rebuilding overhead lines with insulated spacer cable that allows for incidental contact from external debris (tree branches, etc.) without creating a fault and potential spark. Where insulated spacer cable is not an option (due to weight and span lengths), the conductor will be insulated at the crossarm to prevent phase-to-phase contact from wildlife. Standard Overhead fuses will be

replaced within the FHCA with non-expulsion fuses that eliminate any melted fuse material from falling to the ground when operated. Distribution poles will be tested and proactively replaced, if required, to prevent failures, diversify the vintages (remaining strength), and reduce wildfire risk due to pole failures.

Q. Please describe the benefits of this investment.

A. Proactively investing in wildfire mitigation projects in identified FHCAs reduces the risk of catastrophic fire, directly benefiting PacifiCorp customers. In addition, reducing the risk of catastrophic fire benefits fire response agencies, preserves customer property and Company facilities, and minimizes the cost of rebuilding.

Q. Please describe any alternatives explored for wildfire mitigation efforts.

A. For wildfire mitigation, as an alternative to rebuilding sections of overhead line with insulated conductors, undergrounding the line was explored. However, undergrounding existing overhead lines, where all transformers and service drops to customers already exist, is estimated to be over five times more expensive than rebuilding overhead lines with insulated overhead conductors. For this reason, overhead insulator conductors were selected as the preferred solution because they provide the same benefits to customers in a cost-effective manner.

DELTA FIRE DAMAGED FACILITIES REBUILD

Q. Please provide an overview of the Delta fire and how it impacted PacifiCorp facilities.

A. The Delta fire ignited on September 5, 2018, two miles north of Lakehead in Shasta County, California. The fire rapidly grew in size and burned along the Interstate 5 corridor near Slate Creek and Dog Creek. The fire burned for weeks and was

98 percent contained on September 23, 2018, having grown to over 60,000 acres impacted. PacifiCorp's impacted facilities inside this area included a six-mile section of the 115 kV transmission line (Line 14) and a five mile section of the 69 kV transmission line (Line 2) that both required a complete rebuild.

Q. Please describe the investment for the rebuild of the Delta fire damaged facilities.

A. The rebuild project consisted of replacing 78 transmission structures on Line 14 and 110 transmission structures on Line 2 that were impacted from the Delta fire. Also included in this project were associated vegetation management (clearing the right-of-way of hazard trees), access road repair, environmental and archaeological studies, inspections and surveys, material hauling charges, and other project oversight requirements. The total-company cost for the rebuild project was approximately $36.1 million.

Q. Please describe the benefits of rebuilding the transmission lines damaged from the Delta fire.

A. The Delta fire damaged both Line 14 and Line 2 to the point where both lines were inoperable and not available as part of the integrated PacifiCorp transmission system. While there are alternative sources and paths available while transmission lines are out, this reduces the overall capability and flexibility of the transmission system as a whole. For example, Line 14 is an interconnection with Pacific Gas and Electric Company from the south that is normally open, but serves as an alternate source if PacifiCorp loses the source from Weed Junction. Leaving Line 14 out of service for any duration leaves the system on a radial feed from the north and increases reliability

risk to PacifiCorp customers. For these reasons, rebuilding the sections of Line 14 and Line 2 that were damaged provides benefits to PacifiCorp's Washington customers.

CONCLUSION

Q. Please summarize your testimony.

A. My testimony demonstrates that there can be significant costs and impacts to the Company and its customers associated with wildfires. Therefore, it is also prudent for PacifiCorp to invest in wildfire mitigation projects in its service territories. My testimony outlines the methodology that PacifiCorp has used to identify locations and specific projects to help mitigate the risk of catastrophic wildfires in the FHCA. I also explain the need to rebuild critical facilities that have been damaged by wildfires (Line 14 and Line 2).

Q. Does this conclude your direct testimony?

A. Yes.