EXH. MAC-1CT
DOCKETS UE-240004/UG-240005
2024 PSE GENERAL RATE CASE
WITNESS: MARK A. CARLSON

BEFORE THE
WASHINGTON UTILITIES AND TRANSPORTATION COMMISSION

WASHINGTON UTILITIES AND TRANSPORTATION COMMISSION, **Complainant,** **v.** **PUGET SOUND ENERGY,** **Respondent.**	**Docket UE-240004** **Docket UG-240005**

PREFILED DIRECT TESTIMONY (CONFIDENTIAL) OF

MARK A. CARLSON

ON BEHALF OF PUGET SOUND ENERGY

REDACTED VERSION

FEBRUARY 15, 2024

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I. INTRODUCTION

Q. Please state your name, business address, and position with Puget Sound Energy.

A. My name is Mark A. Carlson, and my business address is 355 110th Avenue NE, Bellevue, Washington 98004. I am the Director of Generation and Natural Gas Storage for Puget Sound Energy ("PSE").

Q. Have you prepared an exhibit describing your education, relevant employment experience, and other professional qualifications?

A. Yes, I have. It is Exh. MAC-2.

Q. What are your duties as Director of Generation and Natural Gas Storage for PSE?

A. As Director Generation and Natural Gas Storage, I am responsible for financial and operational performance of PSE's thermal, hydroelectric, and wind generation, as well as two natural gas storage facilities. I manage a team consisting of plant leadership, engineers, project managers, and union staff, and engage with external stakeholders relating to PSE's generation portfolio and large-scale renewable energy assets.

Q. What topics are you covering in your testimony?

A. My testimony describes production operation and maintenance ("O&M") expenses presented by PSE for recovery in this multiyear rate case. My testimony will explain how PSE determined the production O&M expenses for its various types of generating assets. Also included in my testimony is a discussion of significant capital expenditures that will occur during the multiyear rate period as they relate to PSE's generation assets.

II. RATE YEAR PRODUCTION O&M EXPENSE

A. Overview

Q How did PSE prepare its rate year production O&M expense for the 2025 and 2026 rate years?

A. PSE has used the forecasted O&M expense from the Board approved five-year plan as the basis for the 2025 and 2026 rate year production O&M expenses included in this filing. This approach is consistent with the approach to production O&M expense that PSE used in the multiyear rate case it filed in Dockets UE-220066/UG220067 (the "2022 GRC"). The Board approved five-year plan is more fully discussed in the Prefiled Direct Testimony of Joshua A. Kensok, Exh. JAK-1CT.

Q Please briefly describe the process used to develop the five-year production O&M plan that was used as the basis for the production O&M expense included in this filing.

A. The process begins with the plant managers reviewing and updating their labor plans to reflect the staffing levels anticipated for the 2025 and 2026 rate years covered in this two-year rate plan. For the most part, the staffing for existing generation remains constant from year to year. The five-year production O&M plan included no significant changes in staffing levels from the current staffing at existing generating plants. Next, the plant managers identify the non-labor expenses anticipated in the rate years. Most of these expenses are fairly consistent from year to year, aside from inflation, and adjustments for changes to forecasted levels of generation. These include, but are not limited to, water and chemicals consumed during generation operations, ongoing programmatic maintenance of equipment, and a base level of corrective maintenance. To this, the plant managers add specific maintenance activities that are identified as necessary for the safe and reliable operation of the generation facilities; this could include such activities as refurbishment of pumps, compressors, condensers, cooling towers etc. The plant managers prioritize this maintenance work at the plant level, and then the plant managers and I, as Director Generation and Natural Gas Storage, review and prioritize the work at the fleet level to meet provided five-year production O&M plan targets. Lower priority maintenance work is deferred into future years as needed.

Q Are there other inputs to the five-year production O&M planning process?

A. Yes, a significant portion of the five-year production O&M plan is defined by contractual agreements with third parties. PSE has contractual agreements for the operation and maintenance of the Freddie 1 and Ferndale generating facilities, maintenance of the Goldendale and Mint Farm combustion turbines, maintenance of the wind turbines at PSE's wind generating facilities, as well as contractual payments for royalties and land rentals at these same wind facilities. These contractual obligations will be discussed later in this testimony.

Q. What is PSE's production O&M expense for the 2025 and 2026 rate years?

A. The rate year production O&M expenses are $112.2 million and $122.2 million for the rate years 2025 and 2026, respectively. Please see Exh. MAC-3, for a summary of rate year production O&M expenses for 2025 and 2026.

Q. Are there any Colstrip Steam Electric Station ("Colstrip") O&M costs included in the 2025 and 2026 production O&M expense calculations?

A. No. Costs associated with Colstrip are not included in the 2025 and 2026 production O&M expenses covered in my testimony. The Colstrip O&M costs are now being addressed through a separate tracker pursuant to the multiparty Settlement Agreement approved by the Commission in PSE's 2022 GRC. This tracker mechanism is discussed in the Prefiled Direct Testimony of Susan E. Free, Exh. SEF-1T.

B. Simple- and Combined-Cycle Combustion Turbine Generation Facilities Production O&M Expense

1. Non-Major production O&M expense for PSE's simple- and combined-cycle combustion turbine facilities.

Q. What is the basis for the calculation of production O&M expense, other than major maintenance, for PSE's owned and jointly-owned combustion turbine generation facilities?

A. As discussed previously, PSE used the O&M expense as forecasted in its five-year plan to represent a normal level of operating expenses for the gas-fired facilities PSE owns and operates. For PSE's jointly-owned gas fired facility, the Freddie 1 Generating Station, the five-year budget was based upon PSE's share of the plant operator's budget, except for major maintenance costs.

Q What are the amounts of non-major maintenance related production O&M expenses for simple and combined cycle combustion turbine facilities that are included in the rate years of this filing?

A. The rate year non-major maintenance production O&M expense included in this filing is $49.8 million and $55.1 million, for the rate years 2025 and 2026, respectively.

2. Major maintenance of PSE's simple- and combined-cycle combustion turbine facilities

Q. What is the basis for major maintenance events and expenditures included in this filing for PSE's simple- and combined-cycle combustion turbine facilities?

A. In general, if the cost of a major maintenance event performed at any of PSE's gas-fired generating facilities is $500,000 or greater, PSE defers and amortizes the costs incurred over the period until the next scheduled equivalent major maintenance event for that facility. If a major maintenance event does not meet the $500,000 threshold, PSE includes the cost of the major maintenance in production O&M expense as incurred. This is the same methodology PSE has used since its 2014 power cost only rate case.

PSE has included amortization associated with events that occurred prior to, and during, the 2025-2026 rate years to the extent that the associated amortization occurs within the two rate years. This is consistent with the approach PSE used in the 2022 GRC to accommodate the multiyear rate plans required by RCW 80.28.425.

Q. What are the costs for major maintenance associated with PSE's owned and jointly-owned simple- and combined-cycle combustion turbine facilities included in this proceeding?

A. PSE's rate year major maintenance expense is $7.1 million and $8.2 million for the rate years 2025 and 2026, respectively. Please see Exh. MAC-4C, for amortization of major maintenance associated with PSE's owned and jointly-

owned simple- and combined-cycle combustion turbine facilities included in the rate years in this proceeding.

C. Hydro Resource Generation Production O&M Expense

Q. How has PSE prepared its forecast of hydroelectric production O&M expense for the rate years in this filing?

A. PSE used the O&M expense as forecasted in its five-year plan to represent a normal level of operating expense for PSE's hydroelectric facilities.

Q. What is PSE's forecast of hydro production O&M expense for the rate years in this filing?

A. The forecast for rate year hydro production O&M expense is $18.9 million and $22.4 million for the rate years 2025 and 2026 respectively. Please see Exh. MAC-3, for a comparison of 2025 and 2026 hydro production O&M expense included in this proceeding to 2024 hydro production O&M expense that was included in the 2022 GRC.

Q. Please describe the basis of rate year FERC license costs associated with the Baker Hydroelectric Project and the Snoqualmie Falls Hydroelectric Project included in hydro production O&M expense.

A. O&M expense associated with FERC license costs included in rate years 2025 and 2026 reflect FERC license O&M costs in the five-year plan for those years. These amounts reflect the escalated costs of ongoing license activities and

specific license costs as stipulated in the License Agreements. This is consistent with treatment of license costs in the 2020 power cost only rate case[1] and the 2022 GRC. Please see Exh. MAC-5 for detailed hydro license O&M expense included in this proceeding.

D. Wind Resource Production O&M Expense

Q. What is PSE's forecast of wind generation production O&M expense for the rate years in this filing?

A. The forecast for rate year wind production O&M expense is $34.6 million and $34.3 million for the rate years 2025 and 2026, respectively. Please see Exh. MAC-6C, for a comparison of 2025 and 2026 wind production O&M expense included in this proceeding to 2024 wind production O&M expense included in the 2022 GRC.

Q. In previous proceedings, PSE has made adjustments to test year O&M to include rent, royalty, and production-based maintenance fees to reflect generation assumptions consistent with those included in the power cost calculation. Does the wind generation production O&M expense included in this filing reflect similar assumptions?

A. Yes. The rents, royalties, and maintenance fees included in the five-year plan were used as the basis for this filing using generation assumptions that were

[1] Docket UE-200980.

provided in the long-term forecasts prepared by Vaisala Corporation ("Vaisala") in 2016. The Commission approved use of the Vaisala forecasts in the 2019 general rate case subject to a wind collaborative with Commission staff. As a result of the collaborative process, PSE and Commission staff agreed that the Vaisala long-term forecasts are the most reasonable representation of wind for use in estimating power costs.

Q. Please explain the nature of PSE's wind rent and royalty expense.

A. Wind turbine production rents and royalties represent variable dollar per megawatt-hour fees paid under contract to project stakeholders and land owners where the wind turbines are sited. These fees are based on the forecasted generation of PSE's wind turbines. Rent and royalty expenses included in this filing amount to [redacted] and [redacted] for the rate years 2025 and 2026, respectively. Please see Exh. MAC-6C, for a comparison of wind rents and royalties included in this proceeding to wind rent and royalty fees included in the 2022 GRC.

Q. Do the wind turbine production rent and royalty payments reflect contract increases?

A. Yes. In accordance with the terms of PSE's development and land lease agreements with project stakeholders, the annual royalty rate and lease payments paid per megawatt hour of energy production are subject to an annual adjustment for inflation.

Q. How is routine and corrective maintenance provided for the wind turbines?

A. PSE's wind turbines at the Hopkins Ridge, Wild Horse, and the Wild Horse Expansion Wind Projects are maintained by the manufacturer, Vestas, in accordance with the terms of the current service agreement. PSE has executed an extension of the Vestas agreement through November 2030, thus extending the same level of maintenance services and generation performance through year twenty-five of the turbines' service lives. Siemens has been contracted to provide all maintenance services at the Lower Snake River Phase I Wind Project. Please see Exh. MAC-6C, for a comparison of maintenance fees included in this proceeding to maintenance fees included in the 2022 GRC. The Vestas Master Service and Maintenance Agreement is provided as Exh. MAC-7C; the Fourth Amendment to the Vestas Master Service and Maintenance Agreement (extension) is provided as Exh. MAC-8C; and the Siemens Service and Maintenance Agreement is provided as Exh. MAC-9C.

III. SIGNIFICANT CAPITAL CHARGES ASSOCIATED WITH GENERATION ASSETS

Q. What are the significant capital charges related to PSE's existing generation assets during rate years 2025 and 2026?

A. PSE's significant capital charges for generation assets in rate years 2025 and 2026 include the following:

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Project Name	2025	2026
Goldendale Rotor Replacement	[redacted]	
Goldendale Major Inspection		
Mint Farm Major Inspection		

Please see Exh. MAC-10C for a detailed breakdown of these forecasted capital charges. Costs were escalated per the escalation methodology used by PSE and discussed in the Prefiled Direct Testimony of Joshua A. Kensok, Exh. JAK-1CT and Dr. Mark N. Lowry, Exh. MNL-1T.

Q. Please discuss Goldendale's combustion turbine rotor replacement.

A. The turbine rotor is the central shaft within the combustion turbine that drives the generator and upon which the compressor and turbine blades are attached.

The Goldendale combustion turbine rotor was manufactured by General Electric International ("GE International"). Per GE International's guidance, and similar to other components located within the gas turbine, the turbine rotor has a maintenance interval at which point the rotor must be removed, disassembled and inspected to identify and repair defects and determine remaining service life of this component. To perform this inspection, extended downtime of six months or more would be required to remove the rotor, ship to GE International for inspection and return for installation. This timeframe makes an inspection economically unviable versus replacement. Based on Goldendale's gas turbine class, the recommended baseline maintenance interval is 144,000 hours.

Exceeding this hours-based interval would significantly increase the likelihood of a major failure of this component and combustion turbine. In anticipation of this milestone, and to maintain safe and reliable operation, Goldendale is scheduled to have the combustion turbine rotor replaced during its upcoming scheduled major inspection in 2025. This will ensure the recommended hours-based limit is not exceeded prior to the next major maintenance event. At this time, Goldendale will also upgrade certain compressor section components to eliminate known failure risks identified by GE International and insurance loss control engineers that are associated with the compressor's current configuration.

Q. Please discuss the major inspections to be performed at Goldendale in 2025 and Mint Farm in 2026.

A. The purpose of a major inspection ("MI") is to inspect or replace components in the combustion and power turbine sections located in the hot gas path section of the gas turbine plus inspections of the compressor section, frames/diffusers, rotor, bearings, and auxiliaries.

The scheduled MI events at Goldendale and Mint Farm in 2025 and 2026, respectively, will be performed by GE International in accordance with the maintenance service agreements in place since 2015. As discussed by Mr. Roberts, in Docket UE-170033, PSE extended contracts with GE International to perform major maintenance on the combustion turbines at the Goldendale and Mint Farm Generating Stations through approximately 2037. The contracted major maintenance events to be performed by GE International are

defined as Hot Gas Path ("HGP") inspections and MI. These inspections alternate at intervals of approximately 32,000 hours of operation. These intervals are contractual and are based upon the original equipment manufacturer's recommendations. Both Goldendale and Mint Farm are expected to reach the recommended hours of operation for MI events in 2025 and 2026 respectively. The Goldendale Service Agreement is provided as Exh. MAC-11C; the Mint Farm Long Term Service Agreement is provided as Exh. MAC-12C; and a letter of agreement regarding both contracts is provided as Exh. MAC-13C.

Q. Are there other major maintenance events that would be performed in 2025 or 2026 if these MIs were deferred?

A. Yes, PSE is well experienced with the dynamic nature of its business and is prepared to react to the unexpected. PSE operates its generating units with some flexibility which allows it to respond to changing circumstances. PSE continually monitors the performance parameters of its generating units, as well as trends in plant dispatch and adjusts the timing of major maintenance events within the generating fleet as required to maximize reliability and minimize operational risks to its generation equipment. These adjustments are performed in coordination with other corporate functions to reflect changing operating conditions, financial management constraints, etc. However, PSE does not compromise on its commitment to maximize safety, reliability, and regulatory compliance while minimizing the risk of equipment casualties.

IV. PRODUCTION O&M EXPENSE FOR PSE'S NEW GENERATION

Q. Please discuss any production O&M expenses included in this filing that relate to facilities placed in service subsequent to the 2022 General Rate Case.

A. This proceeding includes production O&M expense related to the Beaver Creek Wind project ("Beaver Creek") expected to be placed in service in the first quarter of 2025. Please refer to the Prefiled Direct Testimony of Colin P. Crowley, Exh. CPC-1HCT and the Prefiled Direct Testimony of James P. Hogan, Exh. JPH-1CT for further discussion of this new wind facility.

Q. What is PSE's production O&M expense for Beaver Creek for the 2025 and 2026 rate years?

A. The forecast for production O&M expense for Beaver Creek is $13.9 million and $14.2 million for rate years 2025 and 2026, respectively.

Q. Please briefly describe the process used to develop the rate year 2025 and 2026 production O&M expense for Beaver Creek.

A. To determine the production O&M expense for Beaver Creek, a five-year average (2018-2022) of production O&M expense at PSE's existing wind facilities was used to determine a cost per megawatt hour of generation. This rate was then applied to the anticipated annual generation at Beaver Creek. Please see Exh. MAC-14C for a breakdown of forecasted expense.

Q. Does Exh. MAC-3 include production O&M expense associated with Beaver Creek?

A. No, production O&M expense for Beaver Creek is not included in Exh. MAC-3. Beaver Creek production O&M expense will be recovered under the Clean Generation Resources Rate Adjustment mechanism which will include a true up provision once actual costs have been incurred. Please refer to Free, Exh. SEF-1T for additional discussion of this mechanism

V. CONCLUSION

Q. Does this conclude you prefiled testimony?

A. Yes, it does.