Exh. DCG-4C
Dockets UE-170033/UG-170034
Witness: David C. Gomez
REDACTED VERSION

BEFORE THE WASHINGTON
UTILITIES AND TRANSPORTATION COMMISSION

WASHINGTON UTILITIES AND TRANSPORTATION COMMISSION, **Complainant,** **v.** **PUGET SOUND ENERGY,** **Respondent.**	**DOCKETS UE-170033 and UG-170034 (*Consolidated*)**

EXHIBIT TO
TESTIMONY OF

David C. Gomez

STAFF OF
WASHINGTON UTILITIES AND
TRANSPORTATION COMMISSION

PSE's Response to Staff DR No. 177, Operating and Maintenance Costs of Gas-Fired Resources

CONFIDENTIAL PER PROTECTIVE ORDER – REDACTED VERSION

BEFORE THE WASHINGTON UTILITIES AND TRANSPORTATION COMMISSION

Dockets UE-170033 and UG-170034
Puget Sound Energy
2017 General Rate Case

WUTC STAFF DATA REQUEST NO. 177

"CONFIDENTIAL" "HIGHLY CONFIDENTIAL" Table of Contents

DR NO.	"CONFIDENTIAL" Material
177	Designated Information in the Response and Attachments A, B, D, E, F to PSE's Response to WUTC STAFF Data Request No. 177 are CONFIDENTIAL per Protective Order in WUTC Dockets UE-170033 and UG-170034.

BEFORE THE WASHINGTON UTILITIES AND TRANSPORTATION COMMISSION

Dockets UE-170033 and UG-170034
Puget Sound Energy
2017 General Rate Case

WUTC STAFF DATA REQUEST NO. 177

WUTC STAFF DATA REQUEST NO. 177:

Re: Operating and Maintenance Costs of Gas-Fired Resources

In his prefiled direct testimony, Mr. Wetherbee states: "In the 2014 PCORC only variable operating costs were used to model dispatch of the gas-fired resources in Aurora. This was consistent with the actual operational decisions at the time."[1] He goes on to say that, "PSE re-examined its costs in an effort to better understand its costs and more closely align the information used for operational dispatch decisions with the true costs of operating its generation units. In this review process, PSE updated its estimates for variable O&M and major maintenance."[2]

a. Please provide any and all workpapers used to develop each of the Company's data inputs for Variable O&M (VOM), Major Maintenance Adders (MMAs) and Start Up Costs contained in: Mr. Wetherbee's Exh. No. PKW-1CT at 63, Table 16, and accompanying workpaper PKW-WP(C) Resource Summary_17 GRC As Filed.xlsx.

b. Please provide any and all workpapers used to calculate the values in Mr. Wetherbee's Exh. No. PKW-1CT at 63, Table 16, column entitled "PSE Calculated Variable O&M ($/MWh)."

c. Please explain the difference in the method PSE employed to calculate Variable O&M for its gas-fired resources in the column referenced in b., above, with the column in Table 16 entitled "2014 PCORC Variable Operating Costs ($/MWh)."

d. Utilizing the methodology that PSE employed in the 2014 PCORC, please calculate 2017 GRC Variable O&M for the resources in Table 16. Please provide these as part of your response.

e. Please describe the operational dispatch decision making process both before and after the decision was made to modify the dispatch parameters of the gas-fired resources within the Aurora Model.

[1] Wetherbee, Exh. No. PKW-1CT, page 60:9-11.
[2] Wetherbee, Exh. No. PKW-1CT, page 60:12-15.

f. In his prefiled direct testimony, Mr. Wetherbee states: "PSE developed costs using industry definitions and three years of historical data for PSE assets. The new estimates more accurately reflect the costs of operating PSE's gas fired generation and align with industry standards."[3]
   i. What were the references PSE relied on for its "industry definitions" and "industry standards?" Also, please provide the references.
   ii. Please identify the years and assets Mr. Wetherbee refers to as his source of three years of historical data for PSE assets?

g. Please quantify the impact on rate year pro forma power supply expense and revenue requirement in the 2017 PSE GRC resulting from the modeling changes made to the Aurora Model in d., above, and associated with the dispatch of PSE's gas-fired resources.[4]

Any responsive materials provided in Excel format should be fully functional with all workbooks, worksheets, data, and formulae left intact.

Response:

a. Attached as Attachment A to Puget Sound Energy's ("PSE") Response to WUTC Staff Data Request No. 177 is an MS Excel spreadsheet that contains the calculation of:
   1. Major Maintenance Adders ("MMA") ($/MWh)
   2. MMA Start up ($/MW/Start) presented in the Resource Summary file and also in Table 16 of the Prefiled Direct Testimony of Paul K. Wetherbee, Exhibit No. ___(PKW-1T).

   Attached as Attachment B to PSE's Response to WUTC Staff Data Request No. 177 is an MS Excel spreadsheet that contains the calculation of Start Fuel Amount ($/mmBtu/MW/Start) presented in the Resource Summary file.

   Attached as Attachment C to PSE's Response to WUTC Staff Data Request No. 177 is the California Independent System Operator ("CAISO") Business Practice Manual for Market Instruments which includes, on page 38, the $2.80/MWh and $4.80/MWh rates presented as Variable O&M ("VOM") in the Resource Summary file and Table 16.

   Attached as Attachment D to PSE's Response to WUTC Staff Data Request No. 177 is a CAISO template used to calculate the MMA for Mint Farm and Goldendale.

[3] Wetherbee, Exh. No. PKW-1CT, page 60: 15-18.
[4] Using the Aurora Model with the values calculated in response to Data Request No. 177.d., above.

Attached as Attachment E to PSE's Response to WUTC Staff Data Request No. 177 is an MS Excel spreadsheet that contains the support for the Freddy1 VOM presented in the Resource Summary file.

b. The calculations used to produce the PSE Calculated Variable O&M in Table 16 are included in Attachment A to PSE's Response to WUTC Staff Data Request No. 177.

c. The difference in method is limited to what costs are included in the 2014 PCORC Variable Operating Costs and the PSE Calculated Variable O&M. In the 2014 PCORC Variable Operating Costs, aggregate costs included the following:
   - demineralization chemicals
   - heat recovery steam generator chemicals
   - emissions chemicals
   - cooling tower chemicals, and
   - station power and water.

   These costs are also included in the PSE Calculated VOM with the following additional items also included:
   - consumables and
   - corrective maintenance.

   This approach aligns with the methodology outlined in CAISO's "Final Methodology for Calculating Variable Operation and Maintenance Cost Under the Variable Cost Option" (Ronald R. McNamara, October 6, 2011, V1.1), under the premise that generators incur these costs as a function of service hours.

d. Attached as Attachment F to PSE's Response to WUTC Staff Data Request No. 177 is an MS Excel spreadsheet that contains the calculation of variable operating ("VO") costs based on the methodology used in the 2014 PCORC and 2012-2015 data.

e. The operational dispatch decision making process has not changed since the dispatch parameters were modified. PSE's process is based on an analysis of market conditions, reliability standards, resource costs and portfolio optionality. Part of PSE's process is to evaluate and update its resource costs as they change with time, level of service and contractual agreements.

f. Industry definitions and industry standards refer to guidance from the CAISO related to calculation of variable O&M costs. Please see Attachment G to PSE's Response to WUTC Staff Data Request No. 177 for the document "Final Methodology for Calculating Variable Operation and Maintenance Cost Under the Variable Cost Option" for this guidance.

   Attached as Attachment H to PSE's Response to WUTC Staff Data Request No. 177 is a table that depicts data sources and time periods used for calculating PSE VOM and MMA.

g. Because PSE filed updated rate year power costs in its April 3, 2017 supplemental filing, PSE re-estimated rate year power costs in its Response to WUTC Staff Data Request No. 177 based on power costs in the supplemental filing. The re-estimated rate year power costs are $731.6 million, a reduction of $6.1 million from the supplemental filing. Modeling changes include the removal of major maintenance costs from the Aurora input assumptions and using the VO costs described in Part D instead of the CAISO VOM. The revenue requirement is also lower by $6.1 million as a result of this modeling change.

(dollars are in thousands)	**Rate Year Power Costs**
2017GRC Supplemental	$ 737,710
Aurora	[redacted]
Not in Model	
Total Change	[redacted]
WUTC DR 177 Modeling	

While power costs and the revenue requirement for the 2017 GRC are lower in this scenario, it is important to note that the removal of the major maintenance costs and the use of VO only from Part D when making commitment and/or dispatch decisions for gas fired resources are inconsistent with PSE's current operations.

In addition, the emissions limits are exceeded for gas fired resources requiring a cap under the Clean Air Rule ("CAR") given this modeling change. The reduction to power costs of $6.1 million mentioned above does not include the additional costs of complying with CAR due to the exceedance.

[redacted]

Due to size, Attachment A-G to PSE's Response to WUTC Staff Data Request No. 177 are provided in electronic format only.

Designated Information in the Response and Attachments A, B, D, E, F to PSE's Response to WUTC STAFF Data Request No. 177 are CONFIDENTIAL per Protective Order in WUTC Dockets UE-170033 and UG-170034.

ATTACHMENTS A-G to PSE's Response to WUTC Staff Data Request No. 177 are provided in electronic format only