

**BEFORE THE PUBLIC UTILITY COMMISSION
OF THE STATE OF OREGON**

UE 319

Production O&M

PORTLAND GENERAL ELECTRIC COMPANY

Direct Testimony and Exhibits of

*Bradley Jenkins
Aaron Rodehorst*

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I. Introduction

1 **Q. Please state your names and positions with Portland General Electric (PGE).**

2 A. My name is Bradley Jenkins. My position at PGE is Vice President, Power Supply
3 Generation. I am responsible for all aspects of PGE's Power Supply Generation. My
4 qualifications are included at the end of this testimony.

5 My name is Aaron Rodehorst. My position at PGE is Senior Analyst, Regulatory
6 Affairs. My qualifications are included at the end of PGE Exhibit 300.

7 **Q. What is the purpose of your testimony?**

8 A. The purpose of our testimony is to support the operations and maintenance (O&M) expenses
9 associated with PGE's long-term power supply resources. We discuss the recent plant
10 performance of our Generation fleet. We also identify and discuss the major drivers of the
11 2018 test year O&M expenses related to PGE's generating plant operations as compared to
12 actual 2016 O&M expenses.

13 **Q. What are PGE's goals for plant operations and maintenance?**

14 A. Our primary goals for plant-related activities are to manage our Generation plants in a safe,
15 reliable, and economically competitive manner while maintaining compliance with all local,
16 state, and federal regulations, permits, licenses, and environmental standards. We achieve
17 these goals by implementing prudent and timely maintenance practices, establishing
18 effective safety and reliability initiatives, and making necessary investments in our
19 Generation plants.

20 **Q. How is the remainder of your testimony organized?**

1 A. Our testimony has four additional sections. In Section II, we discuss PGE’s Generation
2 resources and their recent performance. In Section III, we discuss our forecast of 2018 test
3 year Generation O&M expenses. We then summarize our request in this filing in Section IV
4 and present Mr. Jenkins’ qualifications in Section V.

II. PGE's Generation Resources

A. Generation Resources

1 **Q. Have you prepared an exhibit that identifies all of PGE's power supply resources for**
2 **the 2018 test year?**

3 A. Yes. Confidential PGE Exhibit 701 lists PGE's generating resources and their expected
4 average energy output as modeled under normal hydro conditions for PGE's initial 2018 Net
5 Variable Power Cost (NVPC) forecast.¹

6 **Q. Have PGE's long-term power supply resources changed significantly since the UE 294**
7 **general rate case?**

8 A. Yes. In Order No. 15-356, Docket No. UE 294, the Public Utility Commission of Oregon
9 approved the addition of the Carty Generating Station (Carty) in customer prices, if placed
10 into service by July 31, 2016. PGE met that deadline when Carty went into service on
11 July 29, 2016.

B. Plant Performance

12 **Q. What are PGE's goals for Generation plant performance?**

13 A. The performance and availability of PGE's generating resources are top priorities for the
14 Generation organization. As a long-term goal, we target plant performance and availability
15 in the top quartile of an industry peer group. On a year-to-year basis, realized plant
16 availability is a key factor in evaluating the Generation organization.

17 **Q. How have PGE's thermal plants performed in 2015 and 2016?**

18 A. In 2015, the majority of PGE's thermal plants experienced no major forced outages and
19 exhibited high availability. Thermal Generation was higher than normal for most of our

¹ Discussed in PGE Exhibit 300

1 thermal plants due to low natural gas prices and the timing of hydro availability. Because of
2 a warm spring in 2015, runoff came earlier than normal and did not coincide with the
3 summer peak, requiring increased dispatch of thermal facilities to meet loads.

4 In 2016, the majority of PGE’s thermal plants continued to perform very well,
5 experienced no major forced outages, and maintained a high availability. Similar to 2015,
6 we had mild winter and spring temperatures at the beginning of the year causing the
7 economic displacement of the Boardman generating plant. Towards the end of 2016, high
8 amounts of rain led to increased hydro availability displacing the majority of our thermal
9 resources.

10 Confidential PGE Exhibit 704 provides historical 2013 through 2016 thermal plant
11 availability and forced outage rates reported quarterly by PGE to the North American
12 Electric Reliability Corporation (NERC), and finalized annually.²

13 **Q. Were there any exceptions in 2015 and 2016?**

14 A. Yes, just one plant. Beaver generating plant’s forced outage rate is higher in 2015 and 2016
15 due to unplanned maintenance work:

- 16 • In 2015, Unit 3 had an unplanned hot gas path inspection following a routine
17 inspection, Unit 6 experienced excessive internal oil leaks requiring immediate
18 troubleshooting and repair, and Unit 7 (steam turbine) had excessive vibration on the
19 generator requiring disassembly and repair of the end blocking of the rotor windings.
- 20 • In 2016, Unit 2’s Major Inspection was extended due to discovery work identified
21 during repairs creating an unplanned outage extension, Unit 7 (steam turbine)

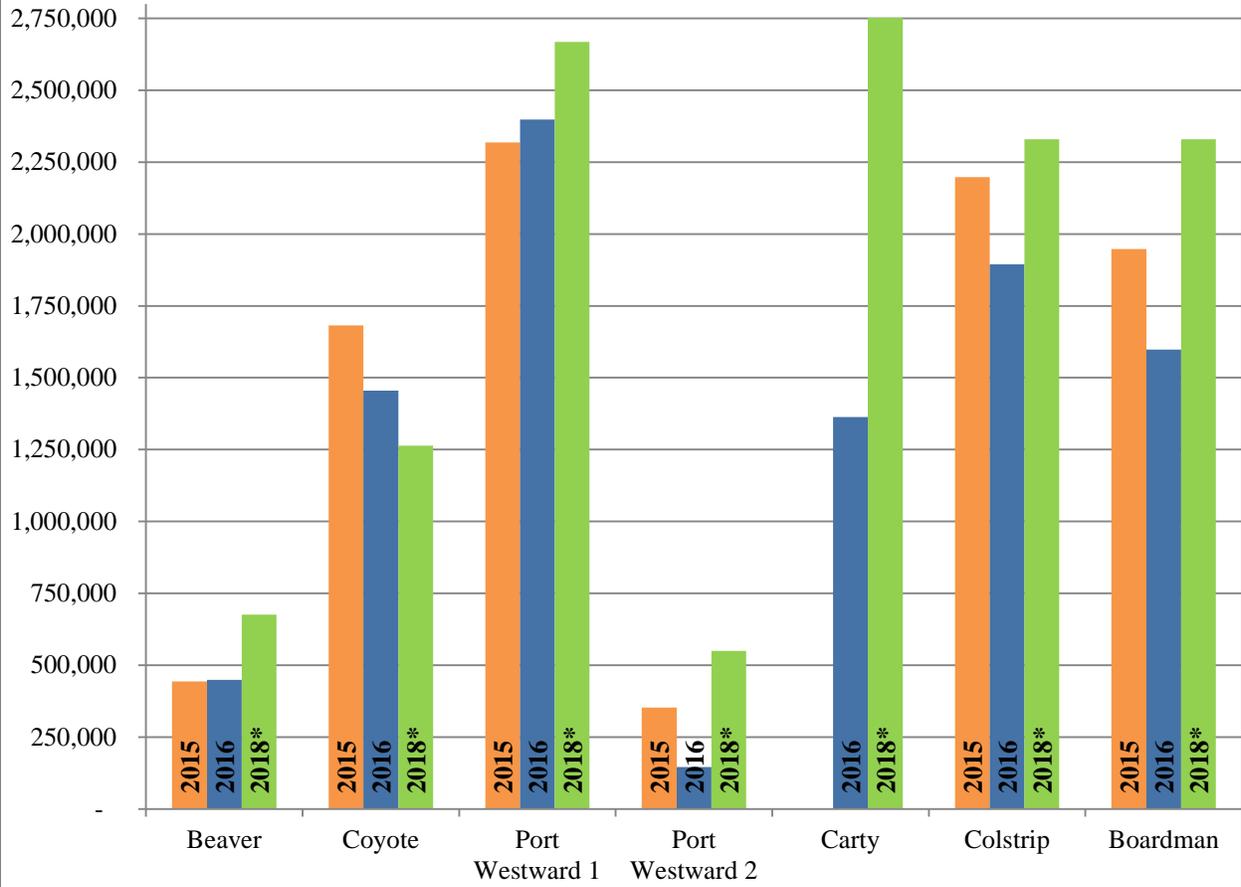
² Forced Outage Rates reported to NERC are not equivalent to the forced outage rate methodology applied in PGE’s Net Variable Power Cost (NVPC) forecast. See PGE’s Minimum Filing Requirements included as part of PGE’s NVPC forecast for details on the forced outage rate methodology employed in MONET.

1 experienced vibration issues requiring a rebalancing, and Unit 8 was forced out most
2 of the year due to compressor damage and evaluation of repairs.

3 **Q. How does the 2018 expected Generation for PGE’s thermal resources compare to**
4 **previous years?**

5 A. Figure 1 below summarizes actual thermal Generation for 2015 and 2016, and PGE’s
6 current 2018 forecast for each of our existing thermal resources. Thermal Generation is
7 expected to increase for our thermal resources in 2018 relative to 2016, primarily due to
8 weather normalization and forecasted low fuel prices, which we expect to contribute to
9 increased dispatch. PGE Exhibit 300 presents our 2018 NVPC forecast.

**Figure 1: PGE Thermal Resource Generation
 (MWh)**



Data Source:
 *2018 based on initial NVPC forecast presented with this filing
 2016 based on the 2016 EGR&D YTD Report presented in Docket No. UM 1294 (Monthly Power Cost Report)

III. Generation Plant O&M

A. Generation Plant O&M Expenses

1 **Q. What are the changes in PGE’s plant O&M between 2016 and 2018?**

2 A. Table 1 below summarizes the changes in total Generation Plant O&M expenses. These
 3 amounts include adjustments for emissions control chemical costs.

Table 1
Generation Plant O&M Summary
 (\$millions)*

<u>O&M Expenses</u>	<u>2016</u> <u>Actuals</u>	<u>2018</u> <u>Test Year</u>	<u>Delta</u>	<u>Annual %</u> <u>Change</u>
Labor	\$39.4	\$43.3	\$3.9	4.8%
Non-Labor	\$81.5	\$85.6	\$4.1	2.5%
Major Maintenance Accruals	\$12.1	\$16.3	\$4.2	16.0%
Subtotal	\$133.0	\$145.1	\$12.1	4.5%
Information Technology (IT)	\$12.4	\$14.6	\$2.3	8.7%
Total	\$145.4	\$159.8	\$14.4	4.8%

**May not sum due to rounding.*

4 **Q. How do labor and non-labor plant O&M expenses change from 2016 to 2018?**

5 A. Labor-related plant O&M is projected to increase by approximately \$3.9 million. This
 6 increase is due to labor cost escalation (discussed in PGE Exhibit 400) and an increase to the
 7 number of Full Time Equivalent employees (FTEs) discussed below. Non-Labor related
 8 plant O&M, including the Major Maintenance Accruals (MMA), is projected to increase by
 9 approximately \$8.3 million. The major drivers of these increases are summarized in Section
 10 B below.

11 **Q. What do IT costs represent?**

12 A. IT costs represent expenses that are directly assigned and allocated to Generation and that
 13 relate to PGE’s efforts to develop, operate, and maintain our computer, information, cyber,
 14 and communication systems. IT costs are allocated to all operating areas of the company
 15 and discussed in detail in PGE Exhibit 500.

B. Generation Plant O&M Expense Major Drivers

1. Non-Labor O&M Expenses

1 **Q. What are the major drivers to non-labor O&M expenses?**

2 A. The major drivers to non-labor O&M expenses are: 1) the increase in Carty O&M expenses,
3 2) updates to PGE's Major Maintenance Accruals, and 3) non-labor cost escalations.

4 **Q. Please explain the increase in Carty O&M expenses.**

5 A. Carty O&M expenses are estimated to increase by approximately \$0.9 million due to the
6 plant being operational for the full year 2018. In 2016, Carty began operations on July 29.
7 Customer prices, however, already reflect Carty's full year budget in accordance with
8 Commission Order No. 15-356.

9 **Q. Please explain the increase in Major Maintenance Accrual (MMA) expenses.**

10 A. PGE's MMA benefits to customers, calculation methodology, and expenses are discussed in
11 detail in Section C below.

12 **Q. What is the increase in non-labor O&M expenses due to non-labor cost escalations?**

13 A. Non-labor O&M expenses are forecasted to increase by approximately \$3.1 million in the
14 2018 test year due to non-labor cost escalations. For non-labor costs, we use escalation rates
15 ranging from 1.66% to 3.11% from *Global Insights, Economic Outlook* dated August 2016.
16 Non-labor cost escalation rates are presented in PGE Exhibit 200.

2. Labor O&M Expenses

17 **Q. What is the change in Generation related FTEs from 2016 to 2018?**

18 A. The projected increase in FTEs is approximately thirty-two across Generation.

19 **Q. What are the main drivers for the increase in Generation-related FTEs?**

1 A. The main drivers of the increase in Generation-related FTEs between 2016 and 2018 are as
2 follows:

- 3 • Ten Power Supply Engineering Services (PSES) FTEs. These FTEs will 1) support
4 increasing regulatory requirements, 2) work on PGE's aging assets requiring
5 upgrades and/or replacement, and increased engineering support to maintain aging
6 infrastructure, 3) develop expanded technical expertise needed as new forms of
7 generation are added and control systems are modernized, and 4) ensure that PGE
8 maintains a strong cyber security program. It is important for PGE to fill these
9 positions in 2017 and 2018 to ensure that PGE's capital investments are utilized in an
10 effective and beneficial manner and to allow PSES to properly manage the workload
11 necessary to meet regulatory compliance and cyber security best practices.
- 12 • Four Resource Planning FTEs. These FTEs will provide increased support for
13 strategic projects, Renewable Portfolios, and Integrated Resource Planning (IRP). If
14 Resource Planning does not fill these positions, the impacts include, but are not
15 limited to, reduced productivity and quality, long delays in regulatory processes, and
16 reduced opportunity for stakeholder involvement.
- 17 • Three Trojan FTEs. These FTEs will support increased Trojan security per Nuclear
18 Regulatory Commission (NRC) Security requirements. PGE is working with the
19 NRC to implement a security staffing that meets their recommendations and industry
20 standards. The NRC has recently completed its assessment of our plan and its
21 conclusions are being disseminated. As a result of the timing, actual staffing may
22 differ from the one submitted for the OPUC review in our 2018 general rate case
23 filing. Nearly all costs associated with these FTEs are reimbursable to PGE through

1 the settlement claim with the Department of Energy for the Trojan Independent Spent
2 Fuel Storage Installation, approved by the U.S. Court of Federal Claims on July 18,
3 2013.

- 4 • Three Environmental and Licensing Services FTEs. These FTEs will support the
5 increased demands of regulatory compliance, FERC license implementation
6 requirements, and increased outreach requirements related to our fisheries program
7 per the Pelton-Round Butte Fish Committee recommendation.
- 8 • Twelve Generation plant and Power Operation FTEs. These FTEs will increase the
9 number of operating crews at Port Westward and support Generation projects, PGE's
10 participation in the Western Energy Imbalance Market (EIM)³ starting in 2017, and
11 increased plant operations and maintenance for Carty, Pelton-Round Butte, and
12 Beaver.

13 Additional detail by FTE is provided in PGE Exhibit 702.

14 **Q. Please summarize the FTEs requested for PSES.**

15 A. PSES provides civil, electrical, mechanical engineering, and survey services to PGE's
16 generating plants and related departments. PSES also provides various forms of
17 administrative support, such as records management, drawing control, and project design.
18 As a result of adding new assets (Port Westward II in 2015 and Carty in 2016), continually
19 expanding cyber security, regulatory and reporting requirements, and aging Generation
20 resources, PSES requires six additional FTEs for administrative, engineering, and analyst
21 positions. Four additional FTEs result from the reorganization of surveyors from Property

³ Discussed in PGE Exhibit 300, Section III, Part C

1 Services to PSES in the middle of 2016 and the transfer of an Admin Specialist from Hydro
2 Operations to PSES in 2018.⁴

3 **Q. Please summarize the position additions in Resource Planning.**

4 A. The IRP process has materially changed from a cyclical process to one that requires an
5 ongoing level of support. In the past the process was cyclical and involved a two-year
6 planning cycle, in which heavy analysis and documentation was completed in the first year,
7 followed by a less intense stakeholder review process in the second year. The emergence of
8 variable energy in increasing quantities and the portfolio effects between all resources have
9 created new challenges for resource planning and system operators. As a result, the IRP
10 process has evolved to incorporate new resource types, characteristics, and relationships.
11 PGE must increase staffing to be able to keep pace with the complexity of the analysis,
12 communicate information to stakeholders, maintain continuity, and ensure appropriate
13 individual workloads.

14 **Q. Please summarize the remaining FTE additions in Generation.**

15 A. The remaining additional FTEs relate to increased environmental regulatory compliance and
16 license implementation requirements, generating plant operation support, other compliance
17 requirements (e.g., Trojan Independent Spent Fuel Storage Installation), and PGE's
18 participation in the Western EIM. As noted above, detailed information by FTE is provided
19 in PGE Exhibit 702.

⁴ The four FTEs transferred from Property Services and Hydro Operations represent a net zero FTE impact company wide and will have no incremental costs to customers.

C. Major Maintenance Accruals

1 **Q. Please explain the major maintenance accrual (MMA) included in fixed O&M costs.**

2 A. Major maintenance costs can vary dramatically from year to year and, absent an MMA, PGE
3 would expense the major maintenance costs in the period the work is performed.
4 Accounting for costs in this manner has two significant drawbacks: 1) it does not allow the
5 recording of expense in the same period the benefits⁵ occur; and 2) it results in an expense
6 that is cyclical and “lumpy” over the years. Due to this, it can be problematic to establish
7 stable prices. To avoid these problems, the Commission approved in Docket No. UE 93
8 (Order No. 95-1216) an accrual and balancing account treatment for major maintenance
9 costs.⁶ The major maintenance accrual is based on a multiple-year forecast of major
10 maintenance activities with an accrual estimate designed to bring the balancing account to
11 zero at the end of the multiple-year period. By balancing the costs and collections, PGE
12 achieves an appropriate matching of costs to both the period and customers benefitted. The
13 accrual also results in a better matching of costs with revenue, without requiring PGE to file
14 a rate case every year to capture the swings in major maintenance costs.

15 **Q. How does the MMA benefit customers?**

16 A. Properly matching the major maintenance expense to the period of operation benefits
17 customers by reducing intergenerational inequities in prices to customers. In addition,
18 normalizing the costs reduces the frequency of rate changes because it eliminates the need to

⁵ The benefits are the generation and use of electricity by customers

⁶ Order No. 95-1216 approved an MMA for Coyote Springs. Subsequent Commission orders approving MMAs include: PW1 (UE 262, OPUC Order No. 13-459), PW 2 (UE 283, OPUC Order No. 14-422), and Carty (UE 294, OPUC Order No. 15-356)

1 file nearly annual rate cases or deferred accounting applications to capture the significant
2 increases or decreases in major maintenance costs.

3 **Q. What items are included in the MMA?**

4 A. Major maintenance events occur based upon maintenance intervals established under the
5 company's plant maintenance contracts. Generally, the timing is dependent upon a facility's
6 capacity factor (hours run / hours in period). Listed below are examples of natural gas
7 Generation plants' major maintenance items:

- 8 • Major Turbine and Generator Inspections to perform advanced assessments, along
9 with related work that may include combustion turbine alignment, exhaust frame
10 modifications, repairs to thrust bearings, the generator stator and the generator field.
- 11 • Hot Gas Path Inspection including the disassembly of combustion and turbine
12 sections of the combustion turbine so that parts may be inspected, and repaired or
13 replaced as necessary. The combustion section is where the natural gas is combined
14 with compressed air and burned. The turbine section is where mechanical energy is
15 extracted from the high speed flow of hot combustion gases exiting the combustion
16 chambers.
- 17 • SR Catalyst Replacements.
- 18 • Auxiliary Boiler Maintenance.

19 **Q. How does PGE calculate the MMA?**

20 A. We forecast five years of the expected operational run of our thermal plants using the
21 MONET model and, based on hours of plant operation, we forecast the timing for the major
22 maintenance activities. The total maintenance costs over the five year period are averaged
23 to obtain the annual major maintenance expense.

1 **Q. For which thermal plants are MMAs included in the 2018 test year plant O&M costs.**

2 A. For the test year 2018 PGE will continue to have MMAs for Port Westward 1 and 2, Coyote
3 Springs, and Carty. In addition to these, PGE is proposing an MMA for the Colstrip
4 generating plant.

5 **Q. Please explain PGE’s proposal to create an MMA for Colstrip.**

6 A. Colstrip Units 3 and 4 operate on a three-year maintenance outage schedule. This creates a
7 pattern where maintenance outages occur in two of every three years leading to large
8 variances in costs from one year to another. To address the cyclical and “lumpy” nature of
9 these costs and for the other reasons discussed above we propose creating an MMA for
10 Colstrip.

11 **Q. What is the cost impact of creating an MMA for Colstrip?**

12 A. Creating an MMA for Colstrip would increase the forecasted total MMA amount for the
13 2018 test year by approximately \$2.3 million. However, we propose reducing the MMA
14 amounts for our other thermal plants in the 2018 test year such that the net increase in total
15 MMA after adding Colstrip would be less, or approximately \$1.0 million.

16 **Q. What is the total MMA amount included in the 2018 test year plant O&M costs?**

17 A. The 2018 test year total forecasted MMA expense is \$16.3 million, increasing by \$4.7
18 million over 2016 actuals. The major drivers for this variance are the \$2.7 million increase
19 in the Carty MMA due to having the plant operational for a full-year in 2018 and the \$2.3
20 million increase due to adding the Colstrip MMA. Similar to Carty non-labor O&M
21 expenses, the increase in the Carty MMA has a minimal actual cost impact to customers
22 because Carty’s full annualized budget was placed in rates in accordance with Commission
23 Order 15-356 (UE 294). Based on the current level of the balancing accounts for the MMAs

1 and the latest five-year forecast for Coyote Springs and Port Westward 2 we reduced the
2 annual accrual amounts by approximately \$0.9 million, partly offsetting the increase due to
3 adding the Colstrip MMA. Major maintenance accrual calculations are presented in PGE
4 Exhibit 703.

IV. Conclusion

1 **Q. Please summarize your request for Production O&M in this filing.**

2 A. We request that the Public Utility Commission of Oregon approve PGE’s forecast of \$159.8
3 million in Production O&M costs in the 2018 test year. This represents a \$14.4 million
4 increase from 2016 costs due primarily to non-labor costs escalations, increases in plant and
5 power operations O&M expenses, and labor O&M expenses.

V. Qualifications

1 **Q. Mr. Jenkins, please describe your qualifications.**

2 A. I hold a Bachelor of Science degree in Industrial Engineering from Southern Illinois
3 University and have over 25 years of nuclear and thermal Generation plant experience in
4 operations, maintenance, refueling, and construction. I am a certified Project Management
5 Professional and have worked for Entergy, Energy Northwest and contracted with
6 Tennessee Valley Authority (TVA). I joined Portland General Electric (PGE) in 2012 as
7 Operations Manager at the Boardman coal plant and became the plant manager in 2013. I
8 was promoted to General Manager, Diversified Plant Operations in 2014, overseeing all of
9 PGE's thermal and renewable assets in eastern Oregon and Washington. I was appointed
10 Vice President of Power Supply Generation in September of 2015. Today, I am responsible
11 for over 3000 MWs of wind, solar, hydro, and thermal Generation at 15 Generation
12 facilities, as well as the Trojan Independent Spent Fuel Storage Installation. I am also an
13 Air Force veteran with 9 years of military experience as a Systems Analyst.

14 **Q. Does this conclude your testimony?**

15 A. Yes.

List of Exhibits

<u>PGE Exhibit</u>	<u>Description</u>
701C	PGE Generating Resource Summary
702	PGE Full Time Employees Descriptions
703	PGE Major Maintenance Accrual Calculations
704C	PGE Thermal Plant Forced Outage Rate and Availability 2013-2016

EXHIBIT 701C

Confidential

Dept.	Dept. Description	Description	Basis for Position(s)	FTE
GENERATION				32.0
16	Power Operations	Energy Market Settlement Analyst	PGE will join the Western Energy Imbalance Market in the latter half of 2017 and the Market Operator will be sending PGE large settlement files on a frequent basis. Two additional FTEs are required to perform this work.	2.0
16	Power Operations	Energy Market Policy Analyst	Required to monitor the policy and rule changes implemented by the Western Energy Imbalance Market. The position will be needed early in 2017 to assist Market Trials prior to live participation in the Western Energy Imbalance Market in the latter half of 2017.	1.0
62	Trojan	Independent Spent Fuel Storage Installation (ISFSI) Technician	Required to perform security, operating, maintenance, and administrative functions at the Trojan ISFSI. The ISFSI technicians will report to the ISFSI Supervisor and are responsible for the safe storage of spent nuclear fuel from the Trojan Nuclear Plant. The ISFSI technicians are being added in response to recent NRC Security Inspector comments highlighting the need for additional staff to adequately cover security duties required in federal regulation. Nearly all costs are reimbursable to PGE through the DOE settlement claim for the Trojan ISFSI.	3.0
86	Port Westward 2	Generation Technician	Required to support progression from four to five operating crews and maintenance. Having the additional FTEs will also reduce the use of contractors during PW2 annual outages.	3.0
88	Carty	Generation Technician	To better align gas plants, a planner scheduler was added to all gas plants in 2015. That 1 FTE count was not added to Carty total head count resulting in Carty being one Generation Technician short. Adding this FTE is required to ensure that plant operations and maintenance are being done in an effective and efficient manner.	1.0
161	Pelton-Round Butte	Maintenance Supervisor	Pelton Round Butte operation and dispatch changed significantly over the past 5 to 10 years with the plant being cycled more frequently and seemingly relied upon more for ancillary services as opposed to primarily being base loaded in the past. This position is required to manage critical asset maintenance and coordinate maintenance support and outage planning services in support of plant operations.	1.0
Various	Beaver	Temporary Hourly Positions	Required to reduce overtime and are partially offset by savings from this reduction. Although the three temporary hourly positions appear to be an increase, this is because PGE opted to contract out the work these positions would have done in 2016. As such, 2016 outside services is over budget while temporary labor is under budget. PGE continues to expect to need this support and has budgeted three FTEs for 2018.	3.0
551	Power Supply Engineering Svcs	Surveyors	Reorganization of surveyors from Property Services to PSES in the middle of 2016. FTE impact is a net zero change company wide and will have no incremental cost to customers.	3.0

551	Power Supply Engineering Svcs	Cyber Security Engineer	With the additional and existing Industrial Control System (ICS) generation assets (i.e. assets that run plant generators), the ever increasing workload will require a deeper level of cyber security engineering support. The cyber engineer position is required to ensure PGE generation sites are able to respond to the ever changing cyber security threats. Each engineer is working to balance operational requirements with defending our current technologies from cyber-attacks.	1.0
551	Power Supply Engineering Svcs	Cyber Security Analyst	With the current cyber-attack rate at existing and future industrial Control System (ICS) generation assets, PGE has implemented capital projects associated with a Network Intrusion Detection System (NIDS). These recent software and hardware investments require an analyst position to tune and develop the NDIS system to ensure all PGE generation sites have proper protocols to respond to cyber-attacks.	1.0
551	Power Supply Engineering Svcs	Compliance Specialist	Required to assist in understanding, interpreting, communicating, and implementing PGE compliance with North American Reliability Corporation (NERC) and Western Electric Coordinating Council (WECC) regulatory standards.	1.0
551	Power Supply Engineering Svcs	Analyst	Required for additional support of PGE's new Reliability, Performance, and Monitoring (RPM) Center initiated in 2016. The RPM Center brings in house the plant and asset performance monitoring historically provided by General Electric's "Smart Signal" service. Additionally, the RPM Center will provide an extra level of vigilance as PGE begins more frequent cycling of generating plants.	1.0
551	Power Supply Engineering Svcs	IT Analyst	Will function as a dedicated generation resource for resolving IT issues at Generation facilities. With the ever expanding role of IT based systems at PGE, a dedicated resource is required to ensure that issues at remote Generation facilities are addressed in a timely manner.	1.0
551	Power Supply Engineering Svcs	Admin Specialist	transfer from Hydro Operations. FTE impact is a net zero change and will have no incremental cost to customers.	1.0
551	Power Supply Engineering Svcs	Technical Writer Specialist	Required to assist with the development and maintenance of over 200 generation procedures, including Generation Fleet, Environmental, Cyber Security, Compliance, Reliability, and plant specific procedures.	1.0
554	Generation Projects	Project Manager / Senior Project Engineer	Required to provide expertise for engineering reviews, project coordination, and project management. The Generation Project department is planning for the next five years while continuing to support current projects, intracompany requests for support of projects, and evaluation of new and evolving technologies to support future projects. In analyzing the timeline of the current IRP, currently proposed renewable RFP, and future RFPs, and the timeframe to develop new supply- and demand-side resources, Generation Projects has identified a gap in staffing that threatens the ability of the group to successfully deliver complex and strategic for our customers.	1.0

	Integrated Resource Planning	Analyst	<p>Required to provide strategic and technical analysis, including economic evaluations or resource options needed to meet the electric energy needs of PGE customers. They will also provide analysis to support recommendation regarding several regulatory processes, including, but not limited to, the IRP and Competitive Bidding (RFP). With the increased workload due to the emergence of variable energy in increasing quantities and the portfolio effects between all resources, current employees are consistently working more than 40 hours per week affecting the work quality and significantly increasing the risk for mistakes. Additionally, important work is being deferred or dropped due to lack of bandwidth to complete critical tasks.</p> <p>Several options to fill the business needs, minimize impacts and overcome the challenges were evaluated, including contractors, sunset positions, cross-training, and long-term temporary positions. None provide the necessary support to maintain quality and efficiency over the long term.</p>	3.0
556	Integrated Resource Planning	Project Manager	<p>Required to facilitate management and coordination for the models to support evaluation of technologies, locational deployment and use cases for all resources, as well as development of the documentation and materials necessary to transparently communicate the information produced through the IRP and related process.</p> <p>Several options to fill the business needs, minimize impacts and overcome the challenges were evaluated, including contractors, sunset positions, cross-training, and long-term temporary positions. None provide the necessary support to maintain quality and efficiency over the long term.</p>	1.0
841	Environmental and Licensing Services	Project Controls and Compliance Specialist	<p>Required to develop, implement, research, and support project control for PGE's environmental projects, ensure their implementation in an economical manner, and coordinate compliance, communication and interaction among various PGE departments and groups. The position will also develop department budgeting and staffing strategy and schedules based on projected projects going through funding process.</p>	1.0
842	Eastside Biological Services	Technician, Environmental Communication	<p>The Pelton-Round Butte Fish Committee, comprised of 22 state and federal agencies and NGOs have raised concerns about the growing outreach needs related to our fisheries program, and that current staffing isn't sufficient to meet that without affecting the biological program. Currently there is an active adversarial group, the Deschutes River Alliance (DRA) on the Deschutes River that opposes the Pelton Round Butte fisheries and water quality program. DRA is currently suing PGE under the Clean Water Act. The DRA has a very active and effective public relations campaign. PGE's communication/PR hasn't been sufficient given the increased negative campaigning. This position was created to provide a dedicated person, located on the Eastside, to increase our outreach efforts in the community. Before this, the Eastside Biological staff tried to fill the gap, but this increased workload was interfering with their ability to complete FERC required tasks. The risk of not providing increased outreach is that DRA's influence would grow, adding other NGOs and community members to their supporters threatening PGE's investment in the Selective Water Withdrawal fish collection facility.</p>	1.0

844	Environmental Compliance and Licensing	Environmental Specialist	Required for multi-media environmental support for eastside non-hydro generation sites (Biglow Canyon, Boardman, Carty, Coyote Springs, Tucannon), with emphasis on air quality and waste management. Increased regulations and activities include coal combustions residuals, ODEQ changes to air quality permitting, and general environmental support for generation facilities.	1.0
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**Exhibit 703 is voluminous in size,
provided in electronic format only**

EXHIBIT 704C

Confidential