Portland General Electric Company
121 SW Salmon Street • Portland, Oregon 97204
PortlandGeneral.com

September 25, 2009

Via Electronic Filing and U.S. Mail

Oregon Public Utility Commission
Attention: Filing Center
550 Capitol Street NE, Ste. 215
Salem OR, 97308-2148

Re: UE 204 – Selective Water Withdrawal Project

Attention Filing Center:

Enclosed for filing in the above captioned docket are an original and five copies of:

Rebuttal Testimony and Exhibits of Portland General Electric Company:

- **PGE/300-334/Keil-Nichols-Hager – Selective Water Withdrawal**
- **PGE/400-402/Bennett – Benchmark**
- **PGE/500-502/Pinnell – Contracting**
- **PGE/600-603/Quennoz-Hager – SSW Project Update. (Portions of PGE Exhibit 600 are redacted and are included under separate cover, pursuant to Protective Order No. 08-515.)**

Included are confidential and non-confidential portions of Exhibits. The confidential portions are in a separately sealed envelope and subject to Protective Order No. 08-515. Please do not post the confidential portions on the OPUC website.

An extra copy of the cover letter is enclosed. Please date stamp the extra copy and return to me in the envelope provided. Thank you in advance for your assistance.

Sincerely,

Patrick G. Hager
Manager, Regulatory Affairs

CERTIFICATE OF SERVICE

I hereby certify that I have this day caused the foregoing **PORTLAND GENERAL ELECTRIC COMPANY'S UE 204, REBUTTAL TESTIMONY, EXHIBITS, AND WORK PAPERS** to be served by electronic mail to those parties whose email addresses appear on the attached service list, and by First Class US Mail, postage prepaid and properly addressed, to those parties on the attached service list who have not waived paper service from OPUC Docket No. UE 204.

Dated at Portland, Oregon, this 25th day of September 2009.

Patrick G. Hager
On behalf of Portland General Electric Company

eDockets

Docket Summary *Return to Search Page* *eFilir*

Docket No: UE 204 **Docket Name:** PORTLAND GENERAL ELECTRIC Print Sum

Subject Company: PORTLAND GENERAL ELECTRIC

In the Matter of PORTLAND GENERAL ELECTRIC COMPANY, Request for recovery of costs associated with its Selective Withdrawal Project. Filed by Randall J. Dahlgren; together with CD containing exhibits & CD containing non-confidenti

Filing Date: 10/24/2008 **Advice No:** 08-15

Effective: 11/15/2009 **Expiration:** 11/14/2009 **Status: SUSPENDED**

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Law Judge: LISA HARDIE **Phone:**

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General information about Tarifi

ACTIONS **SERVICE LIST (Parties)** SCHEDULE

W=Waive Paper service **C=Confidential HC=Highly Confidential** Sort by Last Name Sort by Company Name

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BEFORE THE PUBLIC UTILITY COMMISSION

OF THE STATE OF OREGON

UE 204

Selective Water Withdrawal Filing

PORTLAND GENERAL ELECTRIC COMPANY

Rebuttal Testimony

September 25, 2009

UE 204 / PGE / 300
Keil – Nichols – Hager

BEFORE THE PUBLIC UTILITY COMMISSION

OF THE STATE OF OREGON

Selective Water Withdrawal

PORTLAND GENERAL ELECTRIC COMPANY

Rebuttal Testimony and Exhibits of

Julie Keil
Steve Nichols
Patrick G. Hager

September 25, 2009

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I. Introduction

Q. Please state your names and positions.

A. My name is Julie Keil. I am the Director of Hydro Relicensing at PGE. I am responsible for state and federal regulatory issues related to the FERC licensing and regulation of PGE's hydroelectric projects. My qualifications were previously provided in PGE Exhibit 100.

My name is Steve Nichols. I am the Director of the Selective Water Withdrawal Project (SWW), Trojan Decommissioning, and Generation Excellence. I am responsible for the overall project management for the Selective Water Withdrawal Project. My qualifications are provided in Section VI.

My name is Patrick Hager. I am the Manager of the Regulatory Affairs department at PGE. I am responsible for analyzing PGE's cost of capital, including its Required Return on Equity. My qualifications were previously provided in PGE Exhibit 100.

Q. What is the purpose of this testimony?

A. The purpose of our testimony is to rebut the numerous unsupported and incorrect statements made by OPUC Staff and CUB in their reply testimonies. As part of our rebuttal, we specifically discuss:

- The extensive experience of the SWW project team, and PGE's decision making regarding regulatory capital projects,
- Why the Construction Manager/General Contractor (CM/GC) method was the best option for the SWW, the construction and contract methodology was prudent, and the scheduling of the SWW was appropriate,
- The necessity of the contingency costs related to the SWW and provide an update of those costs, and

- CUB's concerns regarding the possible failure of the fish passage portion of the SWW and the used and usefulness of the project.

We also introduce PGE Exhibits 400, 500, and 600. We attempt to clarify the reasons why PGE chose the methods we did in constructing the SWW and to fully address any unsupported or incorrect statements made in reply testimony. Additionally, we wanted to thoroughly address the April 11, 2009 incident, the resulting construction delay, and related impacts.

Q. How is your testimony organized?

A. In addition to this introduction section, there are four additional sections, one for each area mentioned above. The final section contains Mr. Nichols' qualifications.

Q. What other testimony is PGE filing as part of its rebuttal?

A. PGE has three additional sets of testimony. The first, PGE Exhibit 400, is sponsored by Walter Bennett of CH2M Hill. Mr. Bennett was a project manager for both the Rocky Reach Fish Bypass and the SWW and is intimately familiar with both. He explains why Staff incorrectly used the Fish Bypass at Rocky Reach as a comparator for the SWW. He also discusses the necessity of the CM/GC contract methodology that PGE used in the SWW project.

The second testimony, PGE Exhibit 500, is sponsored by Steve Pinnell of Pinnell Busch, Inc. Mr. Pinnell has over 30 years of experience managing design and construction projects and has been a construction consultant specializing in project management services since 1975. He rebuts Staff's assertion that the use of the CM/GC contract is inappropriate for the SWW project, as well as the concepts of cost over runs, guaranteed maximum price, and the benefit of a value engineering study.

Finally, PGE Exhibit 600 discusses the construction delay, root cause analyses, the status of insurance claims, and incremental costs resulting from the delay. In addition, PGE Exhibit 600 provides an update of the project costs and requested revenue requirement in this proceeding.

Q. What does PGE request of the Commission?

A. PGE requests the Commission:

1. Determine that PGE acted prudently in its management of the SWW project,
2. Approve PGE's revised revenue requirement of $12.4 million. This is discussed in more detail in PGE Exhibit 600,
3. Not adopt Staff's argument that certain costs should not be recovered, and
4. Reject CUB's arguments around the used and useful standard.

II. SWW Team Experience

Q. Staff repeatedly claims in their testimony that PGE lacks managerial experience or insight to perform this project, and that, as a result, imprudence led to cost "over runs" and delays. (Staff Exhibit 200, page 4) Do you agree?

A. No. In fact, we do not believe there were any cost "over runs". The changes in project cost are a result of the natural evolution of a project of this size and complexity. Additionally, the experience and qualifications of PGE's team working on the SWW project are quite extensive, as shown below:

Current and Former PGE Employees:

- Steve Nichols is the Director of the Select Water Withdrawal (SWW) Project, Trojan Decommissioning, and Generation Excellence. He has more than 30 years experience in nuclear and hydroelectric power plant operations, outage management, training, and decommissioning. Section VI of our testimony contains his qualifications and PGE Exhibit 301 has additional information regarding his experience, education, and training.
- Doug Sticka is the Project Manager for the SWW and has more than 22 years experience in project and construction management for new power plants, as well as modification and maintenance projects. Since 1986, he has been a Project Manager in the Power Supply Engineering Services Department of Portland General Electric. PGE Exhibit 302 contains further details regarding his experience, education, and certifications.
- Kevin Marshall was the project manager on the SWW until 2007, when he retired. He has approximately 30 years of experience in engineering and project management. He worked for PGE from 1981 to 2007 in various roles, including

nuclear, generation and transmission engineering, as well as serving as the general manager over Power Supply Engineering Services (PSES) from 2003 – 2007. PSES is responsible for engineering, construction and long term asset management of PGE's generating facilities. Projects under his direction have included the fish ladder and dam reinforcements at River Mill, the decommissioning of Bull Run, and multiple other projects at PGE's various generating facilities. PGE Exhibit 303 contains further details regarding his experience, education, and certifications.

- Paul Applegate was the contract specialist on the SWW and has 39 years experience in Purchasing and Contracts; 34 of those years working in Sourcing and Contracts for Portland General Electric. During that time, Paul was the buyer for many of the major contracts implemented by PGE, including the construction of the Boardman coal plant, Trojan Decommissioning, and Biglow Canyon Wind farms. PGE Exhibit 304 contains further details regarding his experience, education, and certifications.

Contractors:

- CH2M Hill is the design consultant and overall project consultant. CH2M Hill is an engineer-procure-construct (EPC) company, specializing in full-service engineering, consulting, construction, and operations. They have over 25,000 employees worldwide and over 60 years of project management experience. Walter Bennett, a senior project manager at CH2M Hill, is the project manager for the SWW, and has a wide-ranging history of project management, particularly with hydro projects. Mr. Bennett has over 32 years of experience and specializes in water resource and fish passage and protection projects. Mr. Bennett's client list includes electrical utilities and irrigation districts primarily on the west coast. His detailed qualifications can be found in PGE Exhibits 400 and 402.

- Barnard Construction is the primary contractor on the SWW. Barnard has over 30 years of experience in successfully completing difficult, heavy, civil construction projects. Many of those projects have involved underwater construction and dam rehabilitation. They have worked on some of the most challenging hydro projects in the United States, including the Lake Mead Intake project, and have partnered with Dix Corporation for work on the SWW. Dix Corporation is one of the premier fish and facilities contractors in the Northwest. They have worked on similar projects such as the Fish Bypass at Rocky Reach and the Hungry Horse Dam Selective Water Withdrawal projects.

Q. Given all of this expert experience, is it likely that PGE was "imprudent" in its approach to the bidding and construction of the SWW as Staff believes?

A. No. The design and construction of the SWW is indeed complex and requires expert project management experience and qualifications. These experts, along with others, decided to bid at the 25% design or schematic design stage. It is not reasonable, as Staff suggests, to simply assert that a "100% design, then build" approach would have been better. As we demonstrate in our testimony, such a 100% design approach was not possible, given the project complexity in both design and construction, the need to assemble a team early to develop a quality project, in addition to the relicensing time constraints, and even if it were possible, the "100% design, then build" approach would likely have cost more.

Q. Staff criticizes PGE management's efforts to control costs, specifically those required by regulatory entities (Staff Exhibit 200, pages 5-6). Are these criticisms justified?

A. No. Staff concludes, through their criticisms, that PGE's oversight is insufficient. We take exception to Staff's allegations and demonstrate below that their criticisms are not valid. Staff also demonstrates with their criticisms their simplistic and incorrect understanding of both the relicensing and the construction processes.

Q. Staff criticizes PGE for not providing or performing a cost-benefit analysis to select the most cost-effective, least risk approach to meeting fish passage and water quality standards established by FERC (Staff Exhibit 200, page 5). Is Staff correct?

A. No. Staff does not fully understand the process in which stakeholders, including the OPUC Staff, participated during the Pelton/Round Butte relicensing process to determine the license requirements that PGE (and the Confederated Tribes) had to meet in order to receive the 50-year license. There were over 20 stakeholders involved in the negotiations, several of which had authority to impose their own requirements upon PGE, in addition to whatever requirements FERC might impose. Over several years, PGE successfully negotiated with these stakeholders, focusing on maintaining project operating flexibility and minimizing the number and potential cost of constraints and came away with a 50-year license and a satisfactory amount (and cost) of constraints. Fish passage and water temperature on the Deschutes River were a significant part of the relicensing settlement. Without the SWW, there likely would not have been a settlement or if there was, it would have been more costly, because the SWW was the only means to achieve both the water quality and fish passage standards required by stakeholders and established by FERC. Thus, there is no alternative to the SWW except to not relicense Pelton/Round Butte, which clearly would not be the best alternative, as we demonstrated in our response to OPUC Data Request No. 14, attached as PGE Exhibit 305.

Q. Were there alternatives to the SWW itself?

A. No. There were, however, alternative designs of the SWW (or similar structures), which PGE considered, and indeed, continued to consider during the design phase. We chose the design that met the criteria established by FERC and provided the lowest cost. As we have noted elsewhere, we even changed the design of the SWW from a "cheese wheel" to the current design because the costs of the cheese wheel became excessive. Thus, we believe we used the most cost-effective design while providing for the best opportunity to achieve a successful result.

Q. Staff suggests that PGE does not perform adequate cost-benefit analyses for regulatory projects. Do you agree?

A. No. Staff cites Mr. Piro's testimony in UE 197, but Staff takes this citation out of context. Mr. Piro references compliance, where not complying is not an option. These situations concern safety, reliability, and regulatory compliance with agencies such as FERC, NERC, and WECC. In the same testimony, Mr. Piro cites several examples of costs that could not be avoided due to such compliance measures. His point is simply that PGE did not have an option to "not comply" and that, therefore, cost-benefit analyses designed to consider whether to comply were unnecessary. Staff, however, takes Mr. Piro's first statement out of context and concludes that PGE's management of such unavoidable costs is therefore lacking. This is not what PGE said in its testimony and is not PGE's management philosophy.

Q. Staff further suggests that PGE has little incentive to manage costs when there is a relatively low cost resource, such as hydro. Do you agree?

A. Certainly not. PGE in fact has tremendous incentives to manage the SWW (and other) projects as effectively as possible, including potential disallowances and regulatory lag. With regard to the SWW, we demonstrate in our testimony that our actions with regard to managing this project were prudent, given the information available at the time and the constraints of meeting the requirements for the new license established by FERC.

Q. Staff states that the most recent cost estimate for the SWW is 30% above an original estimate (Staff Exhibit 200, page 3), and alleges that PGE must have been imprudent in managing the SWW project. Is this a valid conclusion?

A. No. The cost increases were caused by necessary changes in the design of the project to meet the requirements of the FERC license and keep construction costs as low as possible. Staff appears to believe that if costs rise (relative to an initial projection), then it is evidence of imprudence. This belief fails to consider the myriad of reasons why costs have changed and any actions taken to manage the project. Costs may change for a host of reasons that have little (or much) to do with the management of a project. However, cost changes, or lack thereof, are not, in and of themselves, a sign of prudence or imprudence. We maintain that the SWW project has been managed prudently to achieve the licensing requirements set by FERC. Finally, an approach of using initial estimates of costs as some sort of definitive prudence benchmark would only provide an incentive to inflate such initial benchmarks.

III. SWW Construction

A. Overview of Staff's Position

Q. Please summarize Staff's overall position related to construction and contracting methods of the SWW.

A. Staff believes that PGE should have spent more time designing the SWW structure before bidding out the project (Staff Exhibit 200, page 3). Staff also believes that the change from the original cost estimations to the cost at the final design stage resulted in cost "over runs", which should be shared between customers and shareholders (Staff Exhibit 200, pages 3-4).

Additionally, Staff states that as a result of the above issues, delays occurred (Staff Exhibit 200, page 4). In support of these cost "over runs" and delays, Staff references a project at Rocky Reach that they believe is comparable to the SWW (Staff Exhibit 200, page 4).

Q. Is Staff correct on these issues?

A. No. As we discuss below, PGE bid the SWW project at 25% design stage, and as one would expect with an innovative and complex project, as the design of the SWW evolved, the cost evolved as well. The fact that the project costs changed over time does not indicate or prove that PGE was imprudent in its execution of the job. Later in this testimony, we demonstrate that PGE had strict cost control over the evolution of the cost of the design and that the methodology and processes for this contract were the best options for this project.

Q. Does PGE discuss these points further in another Exhibit?

A. Yes. PGE Exhibits 400 and 500 discuss in more detail the decision to use a CM/GC type contract, as well as the design process and the use of Rocky Reach as a benchmark.

B. Contract Methodology and Over runs

1. Contract Methodology

Q. When did PGE bid out the SWW project?

A. PGE bid out the SWW project when it reached the schematic design or 25% design stage.

Q. What method of contracting did PGE use?

A. PGE used a Construction Management/General Contractor (CM/GC) method of contracting.

Q. Please explain what the CM/GC method of contracting?

A. CM/GC is a contracting method that utilizes an integrated "Team" approach applying modern management techniques to the planning, design, and construction of a project in order to control time and cost, and to assure quality for the project owner. The "Team" consists of the Agency (PGE), an A&E firm (CH2M Hill - retained by the Agency), and the CM/GC (Barnard). The CM/GC method includes both pre-construction and construction phase services[1].

Q. Why did PGE choose this over other contracting methods such as Design-Bid-Build or Design-Build?

A. The CM/GC contract was the method best suited for this type of project. PGE Exhibit 306 is a whitepaper written by the Oregon Public Contracting Coalition in 2002, a page of which was referenced by Staff (Staff Exhibit 200, pages 7, 9, 15). Page 6 of this white paper describes when a CM/GC alternative method of contracting is appropriate. It states that when the construction and design complexity is very high, a highly experienced team is necessary; there may be multiple bid packages and when the schedule is aggressive, this type of contract is recommended. All of these characteristics are prominent in the SWW project; hence, this type of contract was most appropriate in these circumstances. Messrs.

[1] Definition from State of Oregon website: http://www.oregon.gov/ODOT/HWY/MPB/cmgc.shtml

Bennett and Pinnell discuss the appropriateness of the CM/GC contract in more detail in PGE Exhibits 400 and 500.

2. Project Design and Contractor Bidding

Q. Is it typical for a CM/GC Contract to be bid out when 25% of the design is complete?

A. Yes. As we describe below, a CM/GC contract is used in complex projects and typically requires that the contactor be involved in early design stages.

Q. Staff states several times that the project was bid "with a design that was less than 25 percent complete" (Staff Exhibit 200, page 2, lines 19-20). Is this statement correct?

A. No. PGE issued an invitation to bid when the project was at the schematic design completion, or 25% stage; not less than 25% as referenced by Staff. PGE Exhibits 307 and 308 are proposal letters from two bidders confirming this.

Q. Why did PGE bid this project out at 25% design?

A. As Staff has noted, the SWW is a complex project (Staff Exhibit 200, page 2) that had not been designed in the past, and there were many unknowns and risks, which could be reduced by involving the contractor early in the process. We stated such in our Response to CUB Data Request No. 030 (PGE Exhibit 309):

> At the 25% design stage, it was necessary for PGE to partner with the design team and the contractor to manage costs and design complexities. Beginning work early in the design process with both the design team and the contractor was important to provide innovative construction methods to be incorporated early into the design, that reduced the risk of late changes or field changes; thereby minimizing costs.
>
> Securing a contractor early in the process also assured PGE dedicated fabrication shop space in what was a very competitive construction market. Involving the contractor also improved the overall schedule by allowing for parallel activities such as completing detailed shop fabrication drawings, initial fabrication work, and geological field investigations.

Mr. Bennett discusses this process further in PGE Exhibit 400.

Q. Would bidding this project at 100% design make sense?

A. No. As Mr. Bennett discusses, the contractor needed to be involved in the design of the structure. If PGE attempted to design the entire project (i.e., the 100% design stage) without a contractor's input and then bid the project, it was very possible that no contractor would agree with all of PGE's concepts and assumptions, thereby increasing the likelihood of receiving no bids, or bids that required substantial design modification, which would increase costs and the potential for delays. Further, at the 100% design stage, if the contractors saw issues or ways to improve the design, there would have been additional resources, time, and costs to re-design the project.

Q. Staff suggests that PGE could simply have had Barnard assist with the design and then bid the project out at the 100% design stage (Staff Exhibit 200, page 13). Would this method have been effective?

A. No. Doing so would create a design for the SWW to be built one way. If this full design on a complex project was put out to bid, it is likely that no one but Barnard would bid on it because the other contractors would most likely have required input and design modifications.

Q. How much time did PGE spend in the design phase of the SWW?

A. PGE spent approximately three and a half years designing the SWW. Conceptual and structural design work began in early 2004 and a final design was completed in November 2008.

Q. Why didn't PGE spend more time in the design phase?

A. As discussed in PGE's Responses to OPUC Data Request Nos. 042, 043, and 044 and CUB Data Request No. 018 (PGE Exhibits 310, 311, 312, and 313), there are deadlines in the

FERC license for completion of the project. Initially, the license required that the SWW be operational by September 17, 2007. After renegotiating, that schedule was later extended to May 2009. In order to have the SWW operational by May 2009, PGE did not have additional design time for the project. As we stated in PGE's Response to OPUC Data Request No. 44 (PGE Exhibit 312):

> Although the SWW design process took longer than expected, the final product was high quality, accurate and complete and would not likely have been changed or improved with an extended schedule. The changes seen since the design was finalized would have occurred in any event since they are a result of detailed reviews or field conditions determined during the subsequent activities including development of shop drawings, fabrication issues, and construction activities.
>
> As noted above, the initial fabrication and construction schedule was reasonable and achievable and was based on the detailed construction schedule. In addition, it provided reasonable flexibility between construction completion and the requirement to collect fish in early spring and to meet our FERC commitment date of May 2009. The delay in this part of the schedule resulted in a tight but achievable schedule, and the contractors agreed that their scope of work could be completed in accordance with this schedule. This resulted in reduced schedule float and as things have progressed has resulted in schedule work-a-rounds and extra effort to maintain the schedule. However, this has not resulted in any loss of quality or function of the system.
>
> In addition, assuming we complete on schedule, this will allow us to meet all of our commitments to the fish agencies and FERC and take full advantage of all previous actions taken to reintroduce salmonids above the project as noted in PGE's Response to OPUC Data Request No. 43 and PGE's Response to CUB Data Request No. 18.
>
> And as noted in the FERC Order Modifying and Approving Fish Passage Facility Design, it will also allow us to meet the requirement in the water quality certificates issued by the State of Oregon and the Confederated Tribes Department of Natural Resources to initiate operation of the SWW by May 2009.

Also, as we discuss below, the type of construction contract that PGE used allowed the contractor to be brought on board to assist in completing the design, which occurred as soon as possible when there was 25% design completion. This allowed as much time as possible to be spent on the detailed design of the SWW, using the additional expertise of the contractor.

Q. Could PGE have anticipated the unscheduled delay that arose?

A. No. With any complex project of this magnitude, setbacks are not unusual and typically are not specifically predictable. PGE must manage each occurrence independently and work to resolve issues as they arise.

3. Potential for Additional Delays

Q. Could PGE have negotiated an additional extension to complete the project?

A. Possibly, but it is important to remember that the license provisions in question arose out of the exercise of mandatory conditioning authority held by the National Marine Fisheries Service (NMFS) and the U.S. Fish and Wildlife Service (USFWS) under section 18 of the Federal Power Act. In addition, the fish passage conditions were key to the issuance of Biological Opinions and Incidental Take Statements by those two agencies under the provisions of the Endangered Species Act. As a result, any changes to the schedule would require negotiations with NMFS and USFWS and other fisheries agencies before any such request could then be submitted to FERC.

Moreover, steelhead fry and juvenile chinook had been released into the surrounding rivers in 2007 and 2008 in preparation for the project to be complete by May 2009. As stated in PGE's Response to CUB Data Request No. 018 (PGE Exhibit 313):

> These releases were made because we committed to our agency partners, fisheries conservation groups, and other stakeholders that we would have the SWW and Fish Transfer Facility completed to pass the juvenile fish downstream safely in the spring of 2009… Because these fish are only 4 to 8 inches long, substantial delay will add to substantial mortality… We have a good working relationship with these agencies

> and they are counting on us having the facility operational to pass juvenile fish downstream this spring per our commitment.

A further delay in completing the SWW would result in the loss of an entire year of steelhead outplants. Steelhead are listed as threatened under the Endangered Species Act. Now that the fish are in the system and ready to migrate, it is unlikely that the agencies would have agreed to a delay.

Q. Would another deadline extension have lowered costs?

A. No, and in fact a delay could have cost more. Agencies could have argued that a further scheduled delay would cause incremental loss of, or harm to, listed fish and therefore require additional mitigation. Clearly, unforeseen and unscheduled delays such as the one in April 2009 could not have been predicted or anticipated; therefore, negotiations for a scheduling extension in advance were not possible.

4. Cost Over runs

Q. How does PGE respond to Staff's criticism that the CM/GC contract has no Guaranteed Maximum Price (GMP) or cost limitations in the contract?

A. PGE used "open book" pricing for the SWW contract. This method functions similar to a GMP and allows PGE to control and evaluate every change in the contract price. As the design and scope of the project evolved, the overall cost did as well. The contractor had to submit detailed information to document each change in cost. It should be noted that after the completion of the final design, a fixed price was developed for essentially all bid line items based on an evaluation of the initial bid (25% design) and the final design using the open book approach. As stated in PGE's Response to CUB Data Request No. 031 (PGE Exhibit 314):

> As many pricing elements as possible are based on unit pricing, defined labor rates, etc., to provide a consistent cost and method for revising the pricing as the design evolved. The contractor provided a detailed revised price based on a detailed evaluation of each bid item showing the changes to the bid based on the final design and scope. These changes are reviewed and approved as appropriate on a bid item by item basis.

Mr. Bennett and Mr. Pinnell discuss this in more detail in PGE Exhibits 400 and 500.

Q. Staff suggests that PGE was imprudent for not asking for a Guaranteed Maximum price, a cost ceiling or any cost limitations at the 90% design stage (Staff Exhibit 200, page 9). Did the project cost change materially after the project reached 90% design?

A. No. As described above, rather than a GMP, PGE used an open-book pricing method to control costs. PGE's Board confirmed its approval for this project at approximately the 90% design stage in October 2007. The project cost approved at that stage represents project Change Orders 1 and 2, the cost of which the project is still within. These change orders were provided in PGE's Response to OPUC Data Request No. 25 and are provided as confidential attachments to PGE Exhibit 315[2].

Q. How is cost "over runs" defined by Staff?

A. Staff defines cost "over runs" as "actual costs over budget.[3]"

Q. Is this an appropriate way to view these costs?

A. No. PGE is unsure to what "budget" Staff is referring as the basis from which to determine cost over runs. The calculations in Staff Exhibit 202 indicate that Staff concludes any cost change from the 25% design stage to the 100% design stage is a cost "over run". In essence, Staff's proposed adjustments take the difference between the bid price at the 25% design

[2] PGE's Original and Supplemental 1 Response to OPUC Data Request No. 25 is included as PGE Exhibit 315; PGE's Supplemental Responses 2 and 3 are not included as part of PGE Exhibit 315.
[3] OPUC Response to PGE Data Request No. 9, included as PGE Exhibit 316.

stage in 2006 and the cost at the final design stage, and label that difference as “over run”. This is incorrect. Staff then bases their 30% sharing proposal on this calculation.

Q. Is it normal for a large construction project to go through changes in scope and cost?

A. Yes, particularly one of this size, magnitude, and complexity.

Q. Why did the overall cost of the project change over time?

A. As Mr. Bennett discusses, a project with this kind of complexity is likely to change in scope as the design is finalized. The SWW was bid out at a 25% design stage and a contractor was selected at that point in 2006. As the design was completed and the scope evolved, the project cost also evolved, to incorporate cost changes for the changes in scope.

Q. Why did the contract costs increased from 2006 to the current price?

A. As we discussed above, as the design and scope evolved, the project costs also evolved to incorporate the scope changes. Scope changes were discussed in PGE Exhibit 100 (page 13) and detail was provided as PGE Exhibit 105. A more detailed version of PGE Exhibit 105 was provided in PGE’s Response to CUB Data Request No. 33 and is included here as PGE Exhibit 317.

Q. What controls are in place to ensure that PGE is being prudent in allowing these cost changes?

A. PGE described its controls over costs changes in our Response to CUB Data Request No. 31 (PGE Exhibit 314):

> Any approved changes within the scope of the contract are documented by a Field Change Order. Documentation for changes to the design are discussed below. All of the changes based on revised bid items are completed via a Field Change Order. If the contractors have identified other work that is necessary, it is reviewed and approved as appropriate. Field Change Orders are utilized to document any additional work authorizations and/or contract changes that the contractors identify and complete including the appropriate justification. A Field Change Order is forwarded to the PGE Project Director for approval. All of the Field

> Change Orders and related memos to date are included in PGE's Response to OPUC Data Request No. 025, which was provided to CUB in PGE's Response to CUB Data Request No. 1.
>
> If there is a design change, it is processed through a design change program labeled "memo", which requires an engineer review. These memos include the justifications and rationale for the design and/or cost changes. These memos are then reviewed by the contractor and any cost changes associated by these memos are then sent to PGE for review and approval. A Field Change Order is then processed as described above.
>
> Any approved changes outside the scope of the contract are documented by a Change Order. The project manager must document the necessary changes in a Supplement, which is reviewed internally by PGE Management and approved as necessary. If approved, a Change Order is completed, thus modifying the contract.

Q. Has Staff reviewed the documentation for the change orders or field change orders?

A. Staff visited Pelton in early February for a workshop on the SWW, and while there, Staff was provided an opportunity to review all of the above referenced documentation and to walk through the processes for the price changes while the contractors, project managers and PGE staff were present to answer questions. PGE was prepared to demonstrate that each and every change was reviewed, rigorously analyzed, and approved or denied based on that analysis. The documentation, which is the detail for 192 line items, was available for Staff review, but Staff declined to review the material.

Q. Why didn't PGE provide the documentation as work papers or as a response to data requests?

A. The work papers were available in hardcopy but they are extremely voluminous. We have made them available to Staff and other parties to review on-site in Madras. As stated in our Response to OPUC Data Request No. 58 (PGE Exhibit 318):

> The work papers ("backup") for the pricing referenced in Attachment 058-B are voluminous and confidential and are currently in Madras at the construction site. These work papers consist of three 11x17 binders and one additional 3 ring binder. These binders are each several inches

thick and contain design drawings and explanations for pricing and other work papers. These work papers have been available to Staff and other parties during on-site visits and continue to be available for review at the Pelton work site.

5. Summary of PGE's Position

Q. Please summarize PGE's response to Staff's criticisms.

A. PGE's use of the CM/GC contracting method was entirely appropriate for this type of project. Staff's conclusion that the use of this type of contract caused cost over runs is mistaken.

The final 100% construction cost to build the SWW is expected to be $106.9 million. Indeed, the SWW will be completed within the budget that was established at the 90% design stage. There were no "cost-over runs" based on a reasonable definition of the term. PGE has been diligent in the process for building the SWW and as demonstrated in Section II, PGE has many years of experience performing this type of work. To supplement our internal expertise, we hired expert project managers, engineers, and contractors with significant experience. The entire project team agreed that PGE's approach was the best approach to achieve our desired result: a completed project that meets the FERC license requirements with cost controls. In spite of the unforeseen construction delay, PGE has accomplished these goals to obtain a new license.

PGE should not be penalized because of Staff's inappropriate assumptions and lack of experience with the type of contracting method PGE used. Staff has made misguided assumptions that have led to their recommending a $2.78 million reduction in capital. As we have demonstrated, PGE has not exceeded the budget on this project. It is a virtual certainty and quite normal that a project of this nature will change scope through the design phase, which will cause the project price to evolve. This is not a result of imprudence or lack of proper foresight on PGE's part as Staff suggests, but the result of a prudent process with which Staff has little experience.

Q. If PGE were starting this project today, would you still use the CM/GC contracting method?

A. Yes.

C. Least Cost

Q. Staff suggests that PGE did not determine which approach would provide a least cost and best risk solution to fish passage and water quality requirements (Staff Exhibit 200, page 5). Do you agree?

A. No. We discussed the process for design, bidding, and selection of the SWW project in detail in PGE Exhibit 100, Section III and PGE Responses to OPUC Data Request No. 014 and CUB Data Request Nos. 019 and 024 (PGE Exhibits 305, 319, and 320). In summary, PGE performed all necessary analyses and evaluations at each step of the multi-phase process involving the development of a complex, multi-part investment. Staff's objections appear to stem from an unrealistic expectation that a clearly identifiable, "fully-costed" set of alternatives should have been available at the start of the project to allow for a simple cost-benefit analysis. Given the licensing requirements that PGE was obligated to meet for water quality and fish passage, along with our previous experience with fish passage, simple alternatives and evaluations were not available. (PGE Exhibit 400 provides more details on the validity of PGE's processes.)

Q. How does PGE know it selected the least cost bidder?

A. At the 25% design stage, PGE solicited bids for PGE's updated design and also asked for alternative approaches. Of the bids and proposals that PGE received, the least cost proposal was, in fact, selected. In addition, as noted in PGE's response to CUB Data Request No. 035 (PGE Exhibit 321), any subsequent design changes with additional project costs would have been encountered by any other contractor and their prices would also have increased accordingly.

Q. Did PGE fail to perform a cost-benefit analysis as suggested by Staff (Staff Exhibit 200, page 5)?

A. No. PGE performed the one cost-benefit analysis that is relevant to the specific licensing requirements for the Pelton/Round Butte project. As noted in PGE Exhibit 100, PGE demonstrated that the estimated levelized costs for the SWW project were significantly lower than the alternative of not pursuing the projects, not re-licensing the dams, and relying on expensive market purchases to replace the lower-cost hydro energy that would no longer be available. After that determination was made, PGE performed a Value Engineering Study, which identified the most cost-effective approach. Further, by asking the bidding contractors to provide alternative design approaches to meeting the license requirements, PGE pursued the potential for additional cost improvements. Based on these proposals, PGE selected the least-cost alternative to meet the licensing requirements.

Q. Was an additional cost-benefit analysis warranted in selecting the final proposal?

A. No. Staff's assumption that an additional cost-benefit analysis was necessary at this point is incorrect. Once PGE's cost-benefit analysis indicated that meeting the licensing requirements was prudent, then *choosing the least-cost alternative* was the appropriate method for proceeding with the project.

Q. How does PGE respond to Staff's suggestion that a process similar to the IRP process was expected for the SWW?

A. Specifically, Staff states they expected "rigorous analysis, which evaluates alternative approaches to determine the best combination of least cost and least risk" (Staff Exhibit 200, page 4). PGE believes this is the analysis that was, in fact, completed. PGE completed two value engineering studies, and in fact changed the design, to ensure that PGE chose the least cost method to meet the license requirements. Additionally, by encouraging the bidding contractors to submit alternative designs, PGE was seeking other cost effective methods to build the SWW.

Q. Please respond to Staff's concern that because the bid price changed over time, it was difficult to determine whether PGE actually chose the low cost bidder.

A. This is a complex project and a complex contracting arrangement. Staff claims that they are unable to compare the bids at the 100% design stage, and because they cannot compare these bids, they imply that PGE was imprudent in the bidding process. They are mistaken.

The CM/GC contract method does not require, or even suggest as prudent, re-bidding the project at 100%. Therefore, no series of bids exists to compare at 100% design. However, the bids were compared at the 25% design stage and the lowest cost bidder was selected. In addition, through the processes we have explained above and in data requests throughout the docket, it is clear that PGE experienced control over project costs and that costs would inevitably change as the design was modified and completed. A clear comparison of bids at project completion was not possible with this type of contract, nor did it make sense with the complexity of the SWW, which we have explained above.

Q. Can you make any conclusions based on the bids submitted at the 25% design stage?

A. Yes. At the 25% design stage, the lowest price/cost was submitted by Barnard. Based on our cost control methods described above, if we extrapolate the other bids to the 100% level, it is quite likely that the cost would be significantly higher. This is discussed further in PGE Exhibit 400.

D. Delays

Q. What is Staff's position on the delays of the SWW project?

A. Staff claims the following:

- If PGE had taken more time and delayed the project at the start, rather than part way through the project, we would not have incurred the costs related to the September/October 2007 delays or additional overhead charges.
- With a longer design process, construction schedule and testing phase, PGE could have avoided the delay claims and cost-over runs discussed above.

Q. Why did the September 2007 delay occur?

A. As stated in PGE's response to OPUC Data Request No. 33 (PGE Exhibit 322), the delay was mostly related to design issues because the last 10% of the design completion took longer than expected. Additionally, as the design was completed, the construction schedule was extended to March 2009, based on information developed during bid repricing of the final design with the contractor.

Q. Would a longer construction and design period have prevented the September 2007 delay?

A. Not necessarily. The September/October 2007 delay was due to an unexpected delay in the overall design process. The initial overall schedule from design through construction was reasonable and achievable. This schedule was developed with an adequate separation between the completion of the design and the start of subsequent activities.

Q. Was PGE able to minimize the cost of the delay?

A. Yes. As described in PGE's Response to OPUC Data Request No. 33 (Confidential Attachment A of PGE Exhibit 322), PGE saved nearly $1.0 million through diligent negotiations with the contractor. In those negotiations, PGE was able to shorten the construction schedule and continue to work toward a spring completion without additional costs above the settlement amount.

Q. Would a longer construction and design period have prevented the April 2009 delay?

A. No. The April 2009 delay was caused by the structural failure of the Vertical Flow Conduit. The failure was not caused by the schedule, nor would it have been prevented by a longer design and construction schedule. There is more discussion of the April 2009 delay in PGE Exhibit 600.

Q. Are these types of delays unusual or a result of a lack of prudence on PGE's part?

A. No. Every schedule has activities that are tied to the successful completion of others. If any key activity is delayed, the resultant activities are delayed. The key is to develop adequate separation or "float" between the activities, understand and manage the associated risks, and have alternatives planned if possible. However, activities are often delayed due to unforeseen events, regulatory approvals, etc., which necessitate changes in the overall project including delays.

Q. Please summarize PGE's position regarding Staff's proposal to remove costs associated with construction delays.

A. The design schedule and the construction methodology selected by PGE were prudent and the appropriate methods for this project. Therefore, changing the design and construction schedule, which would have required a different construction contract method, would not have been prudent decisions and were, therefore, not appropriate for the work at Round Butte.

As discussed above, delays associated with unforeseen design issues are not a result of imprudence on PGE's part. PGE should not be penalized because the work on a complex and never before attempted project did not go perfectly in accordance with a pre-determined schedule. Staff believes that if PGE had taken more time during construction and design, delays could have been avoided; however, this is simply unproven and an unreasonable characterization made in hindsight. Delays regarding completion of a very complex design are not unusual and Staff has presented no evidence that a change in schedule would have prevented these delays.

E. Rocky Reach as a Benchmark

Q. Does Staff explore using a benchmark project to compare to the SWW?

A. Yes. Staff uses the Fish Bypass Facility at the Rocky Reach Dam as a benchmark to the SWW.

Q. Why does Staff believe the Fish Bypass Facility at the Rocky Reach Dam is a reasonable benchmark?

A. According to Staff, it was the only comparable project they could find in terms of the technology regarding the floating Fish Bypass (Staff Exhibit 200, page 14). Staff states that it was regarded as a one-of-a-kind floating fish transfer and was built in 2003 (Staff Exhibit 200, page 14). Staff lists no other similarities.

Q. Is the Fish Bypass Facility at the Rocky Reach Dam a comparable benchmark?

A. No. There are in fact, numerous reasons why it's a poor benchmark. The Fish Bypass Facility and the SWW have very few comparable attributes regarding construction, process or design. PGE Exhibit 323 is a table that outlines the major differences between the two projects. Table 1 below highlights several of the significant differences:

Table 1. Comparison: Rocky Reach versus Round Butte

	Rocky Reach	Round Butte
100% Fish Exclusion	No	Yes
Prototyping	Yes	No
*Prior Fish Survival Rate	92%	0-1%
Construction Site	On Land	In Water

*Prior to solutions being implemented

Q. Will PGE address this in other testimony?

A. Yes. Mr. Bennett addresses this issue in PGE Exhibit 400.

F. Scheduling of SWW

Q. Please describe the timeline of the SWW necessary to meet FERC requirements.

A. PGE began construction of the SWW in the Fall of 2008. As we noted above, the original FERC requirements had specified September 2007 for SWW completion. Because of the design changes that PGE implemented to make the SWW more functional and cost effective, PGE requested a delay in the completion date until May 31, 2009. PGE negotiated this modification with the agencies and then submitted it to FERC before the steelhead fry and Chinook juveniles were released into the streams above the reservoir. FERC granted this extension on April 3, 2007.

Q. Why was completion by April 15, 2009 important?

A. It was important because, upstream of the dams, hundreds of thousands of steelhead fry were released into streams of the Deschutes and Crooked River basins in May 2007 and 2008. Over 200,000 juvenile spring Chinook salmon were also released into the Metolius Basin streams in February 2008. The timing of these releases was determined based on the SWW completion date, as required by the FERC license. Spring migration for these fish began in March 2009 and continued through June 2009, with peak downstream-migration during the last two weeks of April. April 15th was chosen because it would allow the majority of these small fish access through the SWW project without substantial delay.

Q. PGE missed the April 15, 2009 date due to an unforeseen construction delay. Is this important?

A. Yes. PGE is committed to good faith efforts to comply with its license obligations. Our activities prior to April 2009 were undertaken in good faith with FERC and with the other regulatory agencies. Once it was obvious that as a result of the events of April 11, 2009 we would not meet the previously required deadline, we immediately notified FERC and began discussion with the fisheries agencies regarding necessary steps to salvage what we could of the fish run.

PGE informed the Fish Committee of the structural failure at a meeting at the Project on April 13, 2009, and initiated discussion of measures that could be implemented to provide downstream fish passage. These measures would be necessary, because, over the past couple of years, the Oregon Department of Fish and Wildlife ("ODFW"), in cooperation with the CTWS – Branch of Natural Resources ("Tribes") and the Licensees, has been out-planting spring Chinook salmon and summer steelhead fry into the Metolius, Deschutes, and Crooked Rivers upstream of the Project. Pursuant to the Fish Passage Plan, the out-planting was scheduled so that the timing of the smolt outmigration would coincide with the completion of the SWW. With the temporary setback of construction completion, an alternate strategy was needed to safely transport the outmigrants below the Project.

At the Fish Committee meeting, PGE proposed that, working in conjunction with ODFW and the Tribes, they would trap spring Chinook smolts in rotary screw and Oneida fish traps and then truck and release them into the Deschutes River below the Project. The traps would be operated seven days a week. These fish would be marked, and up to 600 given

PIT-tags in order to monitor travel time and survival from the release site to Bonneville Dam. On April 14th, ODFW and the Tribes approved these measures to continue with the reintroduction program.

On April 21, 2009, PGE filed with FERC, requesting an abeyance of the schedule. In addition, on April 23, PGE filed an update with FERC, detailing its efforts regarding fish passage during this spring. (The request for abeyance of the schedule was granted on May 29, 2009. That Order was modified by an errata issued June 3, 2009).

Q. What was the result?

A. Fisheries agencies understood that PGE had done everything possible to meet the deadline, had cooperated in reasonable steps to ameliorate the impact on fish, and was working as quickly as the situation permitted to complete construction of the SWW. PGE consulted with the fisheries agencies regarding the schedule at the regularly scheduled Fish Committee meeting on August 7, 2009. Because the construction schedule was a part of conditions to the license mandated by NMFS and USFWS, PGE is required to obtain the approval of those agencies. PGE filed a revised construction schedule with FERC in late August. No agency objected to the revised schedule. That schedule has not yet been approved by FERC. Documentation in support of the events listed above are provided as work papers.

Q. Did PGE incur penalties because the SWW was not completed by April 15, 2009?

A. No. Although it was a possibility, the agencies chose not to impose penalties because PGE has continued SWW development in good faith.

Q. What is your reply to Staff's assertion that PGE "could have re-negotiated for an amended schedule, with the agreement of the settlement parties, for a later completion date" (Staff Exhibit 200, page 12)?

A. Staff is misunderstanding PGE's response to OPUC Data Request No. 043 (PGE Exhibit 311). PGE's response notes that a license amendment cannot be obtained without a negotiated agreement with NMFS, USFWS and other members of the Fish Committee. Given the biological resources that would be damaged as a result of an additional delay, it was unlikely that the agencies would agree to a simple extension.

Q. What is the true asset behind the construction of the SWW?

A. The true asset and benefit to customers is the 50-year FERC license to continue operating the Pelton/Round Butte hydroelectric project. As Staff is no doubt aware, the Pelton/Round Butte project provides virtually irreplaceable value to PGE's system and its customers. Nearly all of that operational benefit was retained as a result of the issuance of the new federal license on terms and conditions that included the SWW.

IV. Contingency Costs

Q. Please describe Staff's proposal related to SWW Contingency Costs.

A. Staff claims that PGE "should not be allowed to include in rates approximately $5.4 million in contingency that may not occur" (Staff Exhibit 100, page 14). In PGE's Response to OPUC Data Requests Nos. 49 and 52 (PGE Exhibits 324 and 325), PGE identified approximately $8.2 million (100% share) in the remaining project estimates as contingency dollars, $5.4 million of which would represent PGE's portion of those costs. Because the project at the time had two-and-a-half months left on the construction schedule, Staff claims PGE should have had "a firm grasp" of the final cost, thus implying that any contingencies that may be used should be known at that point in the process. Staff recommends that the entire $5.4 million of remaining contingency be removed.

Q. Does PGE agree?

A. No. At the time of Staff's reply testimony, outstanding contingency reserves were $8.2 million. However, to remove those costs before the project is complete would not accurately reflect project costs. The project was scheduled to be completed in April and would have incurred another four to six weeks of testing before final completion. Any number of issues can arise during completion of a project or subsequent testing that may incur unexpected costs. Indeed, as we now know, issues did arise, which are discussed further in PGE Exhibit 600.

While this seemed like a large amount when compared to the forecasted construction spending, it is only because the majority of the project costs had already been paid. A sizable portion of the contract contingency is related to outstanding issues related to work performed, rather than upcoming work. In a project of this size, and with this much risk, it is normal to have a large amount of contingencies at the end of the project as issues are resolved and the project approaches completion.

Q. In light of the recent project delays, please provide an update on the current status of the contingencies.

A. As of September 18, approximately $2.9 million (100% share) of contingencies are still outstanding, approximately $1.9 million of which represents PGE's share. $5.4 million of contingencies have been settled since PGE's Response to OPUC Data Request Nos. 49 and 52 (PGE Exhibits 324 and 325), dated March 12, 2009. Table 2 below shows the evolution of the contingency dollars since March:

Table 2
Contingency Balances (in $000's)

	March Update*	*Contingencies Settled Since March*	September Update	*Amounts forecasted to be spent*	Remaining Contingency
Construction Contingency	4,777	*4,260*	517	*517*	(0)
Project Mgmt Contingency	3,431	*1,090*	2,341	*222*	2,119
Total 100%	8,208	*5,350*	2,858	*739*	2,119
PGE Share (66.67%)	5,472	*3,567*	1,905	*493*	1,413

*PGE's Response to OPUC Data Request No. 49

Q. Please explain the reduction in estimated contingency.

A. As stated above, approximately $5.4 million in contingency claims have been settled since our responses to OPUC Data Request Nos. 49 and 52 in March. The majority of the settlements, approximately $4.2 million, are from construction contingency and related to the resolution of extra work orders for subcontractors, resolved fabrication and detailing issues. The remaining $1.1 million was settled from the project management contingency, which was for outside contractors and PGE engineering costs.

Q. What does PGE expect the remaining $2.9 million to be used for?

A. PGE has remaining reserves of approximately $0.5 million in construction contingencies and $2.3 million in project management contingencies. There are claims under the construction contingencies that have not yet been resolved related to extra work orders that could potentially total approximately $0.5 million. There are currently approximately $0.2 million in costs forecast to be spent from project management contingency for changes to the forecast of PGE costs for subcontractors outside the Barnard contract.

Q. Are any of the contingency dollars in Table 2 spent on items related to the April 2009 delay?

A. No. We are working through the insurance process to recoup those dollars and are not asking to recover them here.

Q. Please define the purpose of "contingency" funds in a project.

A. Contingency funds recognize the possibility in a project for unforeseen or extraordinary items rising and causing a project to become over-budget.

Q. Does Staff agree with this definition?

A. Yes. In response to PGE Data Request No. 6 (PGE Exhibit 326), Staff discussed their understanding of the use of contingencies and how amounts were determined. Specifically Staff stated that a contingency is "a provision or reserve…for possible changes in scope, unforeseen or extraordinary costs." Further, "contingences are built into the budget to ensure funds are available for unanticipated costs or changes in certain costs."

Q. Please explain the contingencies in the SWW project costs.

A. As detailed in PGE's Response to OPUC Data Request Nos. 49 and 52 (PGE Exhibits 324 and 325), there are two areas that comprise the $8.2 million of contingency in the budget: Construction and Project Management. Construction Contingency is used for outstanding and potential issues related to the construction contract. These are generally claims from the subcontractors or extra necessary work that PGE requested, which was outside of the original bid. Project Management Contingency is used for the overall contingency for the project, and is generally used for PGE expenses and contractor costs outside of the Barnard contract.

Q. How is the amount of contingencies determined?

A. Specific contingency amounts are based on an assessment of the various project risks (e.g., material cost escalation, potential design changes, potential scope additions, etc.) that could affect the overall contract value or the overall project cost. In addition, an overall general project contingency is maintained to address unforeseen issues that are not addressed by specific line item risks. This is typically the difference between the forecast value for all contract and other expenses and the total project budget.

Q. How are contingencies spent?

A. For any change that affects the construction contract value, a contract change order must be developed and submitted to PGE. The contractors request or claim for additional compensation but must contain sufficient information to justify the increased cost. PGE then reviews the claim to determine if the change is included within the base scope of the contract or if the request relates to a change in design, change in scope, or other reasons. Claims are only paid for valid reasons, such as the scope of the design changed and, thus, more or different work than originally priced in the contract was necessary. Contractors must show evidence that the scope or design needs have changed, or that PGE requested them to do extra work. PGE will evaluate the elements of each claim and approve or deny the claims. For example, if a contractor submitted a claim for work that was originally included in the scope of the contract, but the reason for the cost change was that the contractor's prices have increased, PGE would deny the claim. PGE is diligent in requiring contractors to submit detailed information to justify the need for higher costs.

Q. Why aren't all the contingencies amounts known by now?

A. PGE is not reimbursing every claim we receive and sometimes the contractor is asked to gather more evidence that the claim should be paid, which lengthens the decision making process. Additionally, in the process of approving and denying claims, negotiations arise between PGE and the contractors and such negotiations can take time. PGE requires the contractors to show evidence that their claims need to be paid and carefully reviews the material to ensure only those claims that are appropriate are paid, therefore, all unknown contingencies can take longer to resolve than originally expected. Furthermore, as stated above, the project is not yet complete and, therefore, unforeseen costs are still a possibility.

Q. Is it possible that PGE will receive additional claims that will use the remaining contingencies?

A. Yes. Every contractor or vendor has their own internal processes and PGE can not predict when parties will submit claims for additional monies.

Q. Does PGE have an alternative solution to Staff's proposal?

A. Yes. PGE believes that it would be appropriate to true up any outstanding contingencies to actual costs within 30 days of the plant close. PGE expects by then to have the majority of the contingency dollars allocated and claims settled. A true up after the project is complete and has been closed to plant will prevent contingency costs that are unused from being charged to customers, as well as protect PGE from any unexpected costs that may arise before the project is complete. Any revenue requirement difference between actual plant costs and that included in rate base would be trued up in this docket if it remains open at that time, or deferred if this docket is closed.

Q. Please summarize PGE's proposed position regarding contingency costs.

A. Contingencies should not be removed until a project is complete and all costs have been paid. Indeed, Staff, in its response to PGE's Data Request No. 6 (PGE Exhibit 326), states "When a project is *complete*, contingency costs if not expended, are no longer germane" [emphasis added]. As demonstrated above, PGE has used a significant portion of their contingency dollars since March and those dollars and any other contingencies spent should not be removed from the revenue requirement simply because they hadn't been spent by an arbitrary point in time.

While PGE agrees that customers should not be charged for expenses that are not incurred, removing the budgeted contingency dollars before all construction on the project is complete is premature. PGE proposes to true up the contingency dollars within 30 days of close of plant and adjust the final revenue requirement to represent actual amounts incurred for contingency.

V. CUB's Concerns Regarding Fish Passage

Q. What is CUB's primary concern regarding the SWW?

A. CUB believes that the SWW facility is unique and therefore has concerns that the fish passage portion of the project will function as designed. Therefore, the SWW facility will not be used and useful if the fish passage component fails. CUB recommends that there be: 1) an annual review of fish performance, 2) separation of accounting for fish passage, and 3) an annual update of the tariff.

A. Used and Useful

Q. Please describe CUB's concerns regarding the SWW facility?

A. CUB lacks confidence in the SWW structure because it is "unique and has not been attempted elsewhere" (CUB Exhibit 100, page 2, lines 11-12). Because the SWW is designed to change the current in a lake with varying degrees of depth fed by three rivers, CUB believes "this will not be an easy task". We would agree, but also note that we are confident the SWW will work as expected.

Q. What is the purpose of the SWW facility?

A. The purpose of the SWW is three-fold:

- Provide effective downstream anadromous fish passage,
- Restore historic water temperature regimes in the lower river; and
- Allow the relicensing of Pelton/Round Butte with acceptable operating conditions.

Q. Is the SWW unique?

A. Yes, but the SWW is not unique in its individual components, but as a whole structure. As stated in PGE's Response to CUB Data Request No. 02 (PGE Exhibit 327):

> The design is site specific, taking into account the configuration of the hydro project, the geology and the purposes of the structure. However, if we analyze the project with regard to its individual functions, it is not unique. The control of water temperature at hydro projects through the use of multi-level intakes is a well accepted practice and several equivalent facilities have been constructed around the western United States. Similarly, the use of v-screens to collect downstream migrating fish is also common practice.

Q. Will the SWW facility only be used and useful if fish passage meets the current goals?

A. No. CUB's arguments regarding whether the SWW project is used and useful under ORS 757.355 are largely legal arguments to which we will respond in our briefs. However, the Commission's policy regarding the used and useful standard should not require that risks associated with a facility be borne by a utility when the benefits of the facility (power from the Pelton/Round-Butte generating resource) will flow to customers, regardless of whether or not the SWW ultimately improves fish passage results. The FERC license to operate Pelton/Round Butte is the asset that the Commission should decide is used and useful. The SWW facilitates that asset being used and useful for the new license period.

CUB has conflated two distinct concepts (1) the physical success of the SWW facility and (2) the used and useful status of the SWW facility. The physical success of the SWW facility will be determined by measurable outcomes (fish counts, water temperature, dissolved oxygen levels). The SWW facility will be used and useful if it is successful in providing utility service to the customer. To be clear, physical outcomes constitute service to fish. Used and useful requires successful service to the utility customer.

Q. Why is this important?

A. The renewal of the 50-year license is the primary asset. The SWW facility is a necessary precondition for renewal of that license. The FERC license does not require fish passage results be achieved, but rather, requires PGE make a best effort to improve fish passage and water quality. In several orders, the Commission uses the phrase "necessary or useful" in reference to utility capital investments [See for example Order No. 99-415]. The SWW facility is a necessary component of the license renewal process in order to realize the benefits of Round Butte generation for the utility customer. When the SWW facility is placed in service, the facility will be used and useful for PGE customers since PGE's license will not be revoked if fish passage results are not obtained after the SWW is completed.

Q. Are there any other policy reasons why CUB's arguments regarding the used and useful standard should be disregarded?

A. Yes. CUB believes that waiting for a full three generations of salmon and steelhead runs (or about 12 years) is too long to ask customers to pay for a design that may not function as required. However, this is the very understanding of how long it can be expected to take to improve fish passage. By placing a standard of annual fish passage performance beginning presumably after year one, CUB is placing an undue standard that is inconsistent with the expectations of FERC and the numerous parties stipulating to the development of the SWW project.

These parties understood that no project guarantees that fish passage will be improved. While much is understood regarding the science of fish passage, still more remains a mystery. Given the very complexities cited by CUB, the SWW provides the best chance of improved fish passage on the Deschutes River, given our understanding of current science. It is for this reason that the FERC approved, and parties stipulated to, such a project in exchange for a new 50-year license.

Adopting CUB's proposal regarding the SWW would be analogous to adopting a used and useful standard that requires annual review of ambient air temperature data to determine if a wind project had the effect of reducing global warming. This usefulness of the SWW is further discussed in PGE Exhibit 600.

Q. From where does CUB draw its conclusions that the fish passage may fail?

A. CUB references a PGE risk assessment analysis, which contains three line scenarios (fish not finding the forebay, diminished fish passage and increased mortality). CUB believes that the percentages associated with these three scenarios can be simply added together to arrive at an expected failure rate. This is not correct. These probabilities are not absolute, just relative. Indeed, all of the probabilities listed in the table add up to more than 300%.

Q. What was the original purpose of the Risk Assessment referenced in CUB's analysis?

A. As stated in PGE's Response to CUB Data Request Nos. 39 and 41 (PGE Exhibits 328 and 329), this risk assessment was completed in July 2005, early in the design stage to determine some of the major risks for the design, licensing, and construction of the project. The assessment was completed by a group of engineers and others associated with the project in a brainstorming session. The probability percentage is a percentage assigned by the group based on their knowledge and expertise. The numbers were not derived from detailed calculations or analysis. The intent of the process is to identify the major potential risks and develop ways to monitor the risk and ways to eliminate, mitigate, and/or address the risk in some fashion to minimize the potential impact on the overall success of the project. The intent of this analysis was never to determine or reflect on the overall feasibility or success of the project.

Q. What would determine a "failed" fish passage?

A. The license provides numerous criteria against which the function of the SWW will be judged. There are a series of criteria relating to the impact of the facility on fish once they enter it. There are also criteria relating to the SWW's ability to alter currents in the reservoir to help direct downstream migrating juvenile salmonids. However, as discussed in PGE's Response to CUB Data Request No. 40 (PGE Exhibit 330), failure to achieve any single criteria does not necessarily constitute "failure":

> "In the event that defined statistical measures of success are not met and all required steps have been taken to improve collection efficiency, the settlement agreement provides a detailed process for reaching the conclusion that fish passage is "infeasible" and an alternate plan of mitigation should be pursued. This determination is not triggered by any one statistic. Rather, it is linked to a long term evaluation of the overall success of the program in establishing harvestable, sustainable runs."

Q. Is it the opinion of the fish agencies that the SWW will function as designed?

A. Yes. As discussed in PGE's Response to CUB Data Request No. 25 (PGE Exhibit 331), "It was the considered opinion of the fish agencies signing the Settlement Agreement, as well as of the Joint Licensees, that the SWW would function as designed and would fulfill its two key functions: water temperature control and downstream fish passage." The conditions that require the construction of the SWW were approved by the highest level of state and federal agencies and national environmental groups. In addition, the conditions were developed in conjunction with expert agency engineers, including a NMFS engineer with significant experience working on fish passage issues on the Columbia River and elsewhere.

Q. Was the role of the SWW addressed in any regulatory documents other than the FERC license?

A. Yes. In particular, both NMFS and USFWS issued Biological Opinions and Incidental Take Statements that concluded that the continued operation of the Pelton Round Butte hydroelectric project is not likely to jeopardize the continued existence of either steelhead or bull trout. It would not have been possible for these agencies to support such a conclusion had they believed that the SWW was likely to fail. In its Biological opinion, NMFS stated (PGE Exhibit 332, page 8-1):

> "Although some level of adverse effects will continue, …. NOAA Fisheries determined that these effects are reduced to levels that are not likely to reduce the functioning of already impaired habitat or retard the progress of impaired habitat towards PFCs (Properly Functioning Conditions). In particular:
>
> - Reintroducing MCR steelhead to historical habitat above the Project should improve the viability of the Deschutes Basin population through increased distribution and production.
> - Implementation of passage structure and activities designed to achieve a long term juvenile and adult passage survival standard of 75% and 98% respectively, should ensure the success of the fish passage program."

Q. What provisions are included in the settlement agreement that protect PGE's customers in the unlikely event that fish passage is declared to be infeasible?

A. Although we are highly confident that fish passage will be successful, we nonetheless took steps during negotiations to minimize the financial risk to PGE's customers. If it is declared that fish passage is "infeasible", the settlement provides that the cost of "non-passage" mitigation is limited to the net present value of the operations and maintenance costs that would have otherwise been incurred related to fish passage. Even if the fish passage is deemed infeasible, costs to customers will not increase and the 50-year license to operate the Pelton-Round Butte project will still be valid.

Q. Please describe why you believe that the fish passage and water quality components of the SWW will work as expected.

A. It is useful to separate the impact of the SWW on fish that are attracted to and enter the facility from the SWW's impact on the limnology of Lake Billy Chinook.

With regard to the impact of the SWW on the fish that are attracted to and enter the facility, a scale physical model was constructed. The model allowed engineers to calculate the velocities that would occur throughout the structure and to explore the impact on fish at various points of the structure. The results of that modeling, which was state of the art, are reported at "Round Butte Dam Selective Water Withdrawal Facility Physical Hydraulic Model Studies." (ENSR/AECOM January 17, 2007) Agency experts reviewed these modeling efforts and agreed with the results as reported.

The ability of the SWW to affect currents and other limnological parameters in Lake Billy Chinook is central both to the attraction of downstream migrating smolts through the reservoir and to the utility of the structure for controlling downstream water quality. The two issues are inextricably linked. These issues were explored in a series of water quality studies. Key among those studies are "Preliminary Temperature and Hydrodynamic Modeling of Lake Billy Chinook-Pelton/Round Butte hydroelectric project," ENSR, Portland General Electric, Portland Oregon (Khangaonkar, T., Yang, Z., DeGasperi, C., Johnson, P., Sweeney, C.(ENSR)) and Calibration and verification of hydrodynamic and temperature models of Lake Billy Chinook, final report. for Portland General Electric Company. Portland, Oregon. (Yang, Z., T. Khangaonkar, C. Deggaspari, W. Boles, L. Khan, and C. Sweeney. 2000.) These studies, among others, demonstrated that the SWW will reorient currents in Lake Billy Chinook, allowing downstream migrating fish to locate the fish collection facilities while also allowing colder water to be stored so that warm temperatures in the fall can be ameliorated. These studies have been provided as work papers.

Q. If the fish passage fails, is the SWW still used and useful?

A. Yes. Even if the fish passage portion of the SWW fails, we retain the license to operate the plant, which keeps costs low for customers as compared to the open market power purchases, and therefore is used and useful. It will continue to meet all of the requirements for water quality. As noted above, Pelton Round Butte is a very valuable project. The package of license terms and conditions, including the SWW, allowed the project to remain in service, providing operational and economic value to PGE's customers.

Q. If the fish passage fails, should it be removed from rates?

A. No. It is not reasonable to take part of the structure out of rates if a portion of it fails or doesn't meet standards at some point in the future. Once completed, the SWW will be a functional part of the plant, which is required by the license. Building it now was not an option, and in fact, choosing not to attempt the SWW would have the disastrous effect of losing the FERC license to operate the plant.

The real asset in this situation is the 50-year license to continue operating the plant and providing customers with low-cost power.

B. Annual Review of Fish Performance

Q. Please summarize CUB's recommendations to the Commission regarding annual reviews of performance.

A. CUB recommends that PGE be required to "provide an annual review of the project's performance, including fish passage statistics" (CUB Exhibit 100, page 4). CUB suggests that this review should be filed for the full three generations of salmon and steelhead runs, whereas if at any point the project is a failure, the Commission would then have the opportunity to investigate any further actions.

Q. Does PGE already plan to file materials detailing the statistics of the fish passage?

A. Yes. PGE is required by the test and verification study plans to provide annual reports to FERC and the Fish Committee. These reports will be public and can be accessed by CUB, OPUC Staff, or anyone else who would like to review them. FERC will automatically forward everything PGE files to parties that sign up for FERC's "e-subscription" service.

C. Separation of Accounting for Fish Passage

Q. CUB has recommended that PGE separate the costs of the fish passage from the costs of the SWW in the event that there is a future dispute. Has PGE previously addressed this issue?

A. Yes. PGE addressed this issue in its Response to OPUC Data Request No. 4 (PGE Exhibit 333), which was provided to CUB as part of PGE's Response to CUB Data Request No. 1. As PGE stated in that response, and CUB has recognized in their testimony, separating out 100% of the costs for the fish passage portion of the SWW is not possible as many aspects of the SWW are integrated. In Attachment A of the above request, PGE identified the costs that are only related to fish passage.

Q. What is your response to CUB's request to separate out the fish passage costs from other costs of the SWW?

A. Because we believe that the SWW meets the used and useful standard irrespective of whether fish passage is improved beginning in year 1, such a separation is unnecessary, as is the use of interim rates for the SWW.

Q. CUB specifies that it would be open to negotiating the accounting methodology as to how the components are broken out, noting that several items on the bid pricing sheet are already separate and for fish passage only. How does PGE respond to this recommendation?

A. As stated above, the components which can be broken out for the fish passage have previously been provided. Should the OPUC Commission decide to pursue separation of costs for the SWW, PGE's starting point would be its Supplemental Response to OPUC Data Request No. 4.

D. Annual Update of the Tariff

Q. Please summarize CUB's recommendations to the Commission regarding an annual update to the tariff.

A. CUB recommends that the Commission subject the SWW facility to annual performance reviews of fish passage results to determine whether the facility is used and useful on an on-going basis. In the alternative, CUB requests that the Commission approve rates for the SWW on an interim basis, presumably so that the rates could be terminated if the facility was found to not meet fish passage performance criteria. Finally, CUB also recommends that the Commission require that PGE update Schedule 121 rates annually (until the SWW is included in a general rate case) consistent with the Commission's approach in the Biglow 1 (Schedule 120) and Renewables Adjustment Clause (Schedule 122). Otherwise, CUB warns that customers would be paying for more than the actual rate base associated with the project.

Q. Should Schedule 121 be updated annually (until incorporated into base rates through a general rate case) as suggested by CUB?

A. No. The depreciable life for the SWW project is 95 years. As provided in the revenue requirement work papers, the annual book depreciation is expected to be $1.4 million. Thus, absent plant additions or other changes, we would expect the rate base to decrease by $1.4 million per year. Updating Schedule 121 to "capture" this reduction would result in minimal changes to rates ($100 to $200k). This change is immaterial for rate-making and would likely be exceeded by the cost to parties to participate in such an annual docket. The Commission's approval of such a construct for Biglow 1 and the RAC are more reasonable since more substantial declines in rate base would be expected from one year to the next.

CUB also argues that a failure to do such an update may violate ORS 757.355. This again is a legal argument to which we will respond in briefs. Given the immaterial nature of expected annual changes, we believe the best Commission policy would be to not require such updates. However, if the Commission determines otherwise, we would request that the annual updates for Schedule 121 include O&M costs associated with the SWW. As indicated in PGE's response to CUB Data Request No. 11 (PGE Exhibit 334), PGE did not include any O&M for the SWW in this UE-204 proceeding (pursuant to an agreement that this docket would only consider capital costs). However, annual updates to costs should not be limited to rate base and should include associated O&M, just as they are included in the annual update mechanisms for the RAC.

VI. Qualifications

Q. Mr. Nichols, please describe your qualifications.

A. I have three years of college level course work in Mechanical Engineering and Business, as well as project management training. I have obtained certifications for NRC Licensed Reactor Operator & Senior Reactor Operator, Shift Technical Advisor Training and Certification, Management and Supervising, and I have completed a Public Utilities Executive Course at the University of Idaho.

I have been employed at PGE in a variety of positions since 1974, including Manager of Training, Manager of Outage Planning, Manager of Decommission Projects, and General Manager of the Trojan Plant and General Manager of Hydro Operations. Responsible for the major projects associated with the Trojan Plant Decommissioning. One project, the Reactor Vessel and Internals Removal project was elected as the Project Management Institute's International Project of the year for 2000. My current position is the Director of the Select Water Withdrawal (SWW) Project, Trojan Decommissioning, and Generation Excellence.

Q. Does this conclude your testimony?

A. Yes

List of Exhibits

PGE Exhibit	**Description**
301	Steve Nichols Resume
302	Doug Sticka Resume
303	Kevin Marshall Resume
304	Paul Applegate Resume
305	PGE Response to OPUC Data Request No. 14
306	2002 Oregon Public Contracting Coalition Whitepaper
307C	**Proposal Letter from General Construction**
308C	**Proposal Letter from Traylor**
309	PGE Response to CUB Data Request No. 30
310	PGE Response to OPUC Data Request No. 42
311	PGE Response to OPUC Data Request No. 43
312	PGE Response to OPUC Data Request No. 44
313	PGE Response to CUB Data Request No. 18
314	PGE Response to CUB Data Request No. 31
315	PGE Response and First Supplemental Response to OPUC Data Request No. 25 (PGE Supplemental Response 2 and 3 are not included)
316	OPUC Response to PGE Data Request No. 9
317	PGE Response to CUB Data Request No. 33
318	PGE Response to OPUC Data Request No. 58
319	PGE Response to CUB Data Request No. 19
320	PGE Response to CUB Data Request No. 24
321	PGE Response to CUB Data Request No. 35
322	PGE Response to OPUC Data Request No. 33
323	Rocky Reach vs. Pelton/Round Butte Attributes
324	PGE Response to OPUC Data Request No. 49
325	PGE Response to OPUC Data Request No. 52
326	OPUC Response to PGE Data Request No. 6

327 PGE Response to CUB Data Request No. 2

328 PGE Response to CUB Data Request No. 39

329 PGE Response to CUB Data Request No. 41

330 PGE Response to CUB Data Request No. 40

331 PGE Response to CUB Data Request No. 25

332 NMFS Biological Opinion

333 PGE Supplemental Response to OPUC Data Request No. 4

334 PGE Response to CUB Data Request No. 11

STEVEN B. NICHOLS
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Portland, OR 97204
Phone – (503) 464-8147 (w)
Fax - (503) 464-2285

SUMMARY

Thirty plus years of nuclear and hydroelectric power plant experience in decommissioning, outage management, training, and operations.

EXPERIENCE

Portland General Electric Company
8/74 - Present

Director, Selective Water Withdrawal Project (SWW), Trojan Decommissioning, and Generation Excellence 2007- present

Responsible for the overall project management for the Selective Water Withdrawal Project.

Responsible for the over-all organization, planning, and implementation of the tasks necessary for the safe, legal, and efficient decommissioning of Trojan.

Responsible for the planning/coordination of the Generation Excellence Program.

General Manager, Trojan Decommissioning and Hydro Operations 2005- 2007

Responsible for the over-all organization, planning, and implementation of the tasks necessary for the safe, legal, and efficient decommissioning of Trojan.

Responsible for the overall safe and efficient operation of the company hydroelectric facilities and for the FERC re-licensing activities associated with these facilities.

General Manager, Trojan **2003 – 2005**

Responsible for the over-all organization, planning, and implementation of the tasks necessary for the safe, legal, and efficient decommissioning of Trojan in accordance with Trojan business plans and requirements. This includes project management, engineering strategies, decommissioning funding, federal and state regulatory affairs, and corporate and public relations. Responsible for assuring that a high level of quality is achieved in all aspects of Plant activities, the Trojan license conditions and regulatory requirements are met, compliance with applicable Federal, State, and Local laws, and protecting the health and safety of Plant personnel and the public.

Manager, Decommissioning Projects **1993 - 2003**

Responsible for the over-all organization, planning, and implementation of major projects for decommissioning. Involved with all the tasks necessary to safely and successfully complete the Trojan decommissioning projects including project management, engineering strategies, radioactive waste management, contract management, federal and state regulatory licensing activities, and corporate and public relations.

Managed a dedicated project group with matrix support from other departments to successfully implement the following projects:

- Independent Spent Fuel Storage Project – This encompasses all activities related to the implementation of the ISFSI Project. This included over-site of design, licensing, fabrication, and on-site activities. Project completed under schedule and budget.

- The Reactor Vessel and Internals Removal Project - This encompassed all activities related to the intact removal, transport, and disposal of the Reactor Vessel and the internals. Project completed on-schedule, under budget, no lost time accidents, and within the ALARA goal. Project was selected as the Project Management Institute 2000 Project of the Year.

- Responsible for the Large Component Removal Project - This encompassed the removal, transport, and disposal of the Steam Generators and Pressurizer. Project completed on-schedule, under-budget, no lost time accidents, and less than 50% of the ALARA goal.

- Responsible for all decommissioning activities (all equipment and concrete removal and disposal) related to the containment building.

Manager, Outage Planning **1991 - 1993**

Responsible for the planning, schedule development, and execution of detailed and integrated project schedules. This included plant outage schedules, engineering design and construction schedules, and long-range planning.

Manager, Training **1982 - 1991**

Responsible for the over-all development and implementation of training programs for all plant disciplines. Responsible for obtaining National Academy for Nuclear Training Accreditation for all training programs. Responsible for the overall development of a new training facility including classrooms, training laboratories, and control room simulator.

Assistant Operations Shift Supervisor **1981 - 1982**

Responsible for the safe and efficient operation of the plant. This included supervising department personnel, plant equipment operation, and all other operating activities on the assigned shift.

Training Specialist IV **1976 - 1981**

Responsible for the development and conduct of training programs for Operations personnel.

Licensed Reactor Operator **1974 - 1976**

Responsible for operating plant equipment, primarily from outside the control room for system tagging, alignments, and testing. Performed troubleshooting and provided assistance to the Engineering and Maintenance Departments for system response testing and maintenance.

<u>EDUCATION AND TRAINING</u>

- Three years college in Mechanical Engineering and Business
- Public Utilities Executive Course - Univ. of Idaho
- Management/Supervisory Certificate - Portland Community College
- Shift Technical Advisor Training/Certification
- NRC Licensed Reactor Operator/Senior Reactor Operator - 1976 - 1990
- Project Management Training

Douglas E. Sticka

Phone (503) 464-8146 fax (503) 464-2538
E-Mail Doug.Sticka@pgn.com
Address Portland General Electric Co.
121 SW Salmon Street, 3WTCBR03
Portland, OR 97204

Expertise:

Project and Construction Management for new power plants. Also modification and maintenance projects.

Experience:

Portland General Electric, Portland, Oregon, PSES Department, Project Manager, 1986-Present

- Provide construction management for modifications, and maintenance projects for the Company's hydroelectric, gas turbine and coal-fired generating plants. Responsible for administration of contract construction projects utilizing sound project management and construction practices and achieving project schedules and minimizing change orders and extra work. Provide design review of technical specifications and drawings for constructability and clarity. Recently completed projects include;
- Selective Water Withdrawal, Round Butte Dam
- New Albany, Mississippi 384 MW Simple Cycle Power Plant
- Coyote Springs 500kv Switchyard and Transmission Line
- Boardman Coal Plant Distributed Control System
- Oak Grove Hydro Plant Frog Lake Central Dam

Portland General Electric, Construction Coordinator, 1980 to 1986

- Supervise the maintenance and modification activities of the Boardman Coal Plant's maintenance contractor and PGE work forces. Ensure that plant modification and major maintenance activities for multi-discipline engineering and construction projects, primarily, for the boiler & auxiliary systems and fuel handling systems are completed in accordance with plans and specifications.

BECHTEL POWER CORPORATION, Start-up Engineer, San Onofre Nuclear Plant, CA. 1977 to 1980.

- Responsible for prerequisite electrical testing. Resolving engineering problems and making modifications to equipment and control schemes. Insure acceptability of components and systems being released to start-up from construction. This included review of design and installation acceptability. Interface with multi-disciplines in the integrated start-up of plant systems.

Bechtel Power Corporation, Assistant Planning Engineer, San Francisco, CA. 1976 to 1977.

- Engineering planning, scheduling and budgeting for the electrical and control systems group on the design of the Pilgrim Nuclear Power Station.

Portland General Electric, Portland, OR, Technician, Trojan Nuclear Power Plant, OR. 1974 to 1976

- Provide support to the start-up engineers in the initial start-up of the plant. Including equipment checkout and operation and identifying construction and design deficiencies.

EDUCATION:

OREGON STATE UNIVERSITY

- Study in science related courses.

PORTLAND COMMUNITY COLLEGE

- Study in science related courses.

Certificates:

BECHTEL POWER DIVISION COURSES

- Fossil & Nuclear Power Plant Design.

PORTLAND GENERAL ELECTRIC COURSES

- Various Project Management & Leadership Skills courses

NONDESTRUCTIVE TESTING

- Certification Level II - PT, MT & VT.

Revised: 6/21/2000

KEVIN J. MARSHALL, PE

December 2007

WORK HISTORY

PORTLAND GENERAL ELECTRIC

General Manager of Power Supply Engineering Services, 2003-2007

Managed a group of approximately 60 engineers, designers, and admin staff providing engineering services to PGE existing generating plants. In addition the department provides engineering services for the construction of the new thermal and wind projects for PGE and engineering for hydro plant license implementation. The group is responsible for long term asset management for PGE's generation facilities. A member of PGE's Virtual Strategy Committee, Capital Review Group, Plant Reliability Steering Committee, and a member of the PGE Ethics and Compliance Committee.

Manager of Civil Engineering, Generation and Transmission Engineering, 1997-2002

Manager a thirteen person professional staff including civil engineers, surveyors, civil designers, scheduler, and construction coordinator and construction project manager. Responsible for Dam safety, civil engineering plant support, contract construction, scheduling, and surveying for dam checks and construction staking.

Civil Engineer III, Generation and Transmission Engineering, 1993-1997

Provide civil and structural designs, engineering, and project administration associated with the construction, modification, and maintenance of the Company's hydroelectric, gas turbine, and coal-fired generating plants. Included is the responsibility for providing technical judgment necessary to construct or maintain structures sensitive to public safety. Recently completed projects include Coyote Springs civil/structural review, Bull Run flume restoration, Beaver Repowering Geotechnical Study oversight, Beaver hydrogen tank and piping system installation, Boardman Coal Plant explosion restoration, Roslyn Lake embankment stabilization.

Civil Engineer III/IV, Nuclear Plant Engineering 1985-93

Provide civil and structural designs, engineering, and project administration associated with the company's Trojan Nuclear Plant. Responsible for day to day civil/structural plant activities to support ongoing construction and maintenance projects and support plant outages and startups. Typical projects included design and construction support of Emergency Operations Facility, design and construction support of Fuel Building seismic upgrades, construction support of Rad Waste Annex, and design of various security, piping, and structural modifications to the Plant. Responsibilities included specifying anchor bolt inspections, concrete inspections, reinforcing steel inspections, bolt tensioning and testing, structural steel, and welding inspections. Provided engineering oversight and witnessing of structural inspections.

SETON, JOHNSON, & O'DELL, INC.

Civil Engineer/Project Manager 1978-81, 1983-85

Responsible for civil/structural design on various industrial and commercial projects including waste water treatment systems for the Navy, industrial shops for the Navy, water system modifications at the Bremerton shipyard, potato processing plant modifications, railroad overpass design, container handling facility on Columbia River, industrial waste water lagoons, and clarifier designs for aluminum plant. Performed civil site designs for shopping center, condominium/restaurant/marina projects, and several subdivisions.

CHEC CONSULTING ENGINEERS, INC.

Civil Engineer/Project Manager 1981-83

Responsible for the civil site design for a silicon wafer manufacturing plant in Vancouver, WA. Project Manager for the construction of the civil/structural components of waste waster treatment plant for a circuit board plant.

KEN STORY CONSTRUCTION

Project Superintendent, Astoria, OR 1977-78

Site superintendent for construction of 48 unit senior citizens housing project, several residential units, and two commercial buildings.

EDUCATION

RENSSELAER POLYTECHNIC INSTITUTE
Bachelor of Science, Civil Engineering, 1976
One year of graduate studies (Master's work) in Construction Management 1976-1977
PUEC Class of 2000

PROFESSIONAL LICENSES
State of Oregon Registered Professional Engineer (Civil), 1981
State of Oregon Registered Professional Engineer (Structural), 1995

Paul Applegate, Contract Specialist, PGE

Education:
BA in History from Carroll College, Helena, Mont
MA in History from the University of Ore

Work History:
39 Years in Purchasing and Contracts

1975-2009 - 34 years in Portland General Electric's Sourcing and Contracts. During that period of time, I have been a buyer for many of the major contracts implemented by PGE. Some highlights are:

- The lead Buyer for the construction of the Boardman Coal Plant which included most of the major contracts in which the specifications were prepared by Bechtel Corp. but bid and implemented by PGE.
- Lead Buyer for Trojan Outage major modifications. This entailed extensive contract work to support a rigorous Outage schedule which had a huge impact on getting the plant back in operation and thus producing power. This entailed extensive interface and knowledge with the nuclear industry which has a much more complex contractual and regulatory process.
- Lead Buyer for Trojan Decommissioning. These were large contracts with nuclear overtones. Included were such contracts as Removal of the Steam Generators and Reactor Vessel, Implosion of the Cooling Tower, Asbestos Removal, Demolition of all the Buildings, Processing Nuclear Waste.
- The Buyer that negotiated the purchase of the Biglow Phases 1, 2 and 3 Wind Turbines including separate contracts for the erection and installation of the Balance of Plant for the Turbines.
- On going work on the generations facilities. Included are Hydro jobs such as the Removal of the Marmot Dam as well as major modifications to the River Mill Fish Ladder. At the Boardman Plant and Beaver Plant, included are contracts for major Turbine Generator work and a new Boardman Plant simulator

1970-1975 - Spent 5 years as a Buyer at the national purchasing headquarters for Western Electric located in New York City and East Orange NJ. Western Electric was the supply arm of the complete Bell System when the Bell System consisted of AT&T, Bell Laboratories, and all 23 of the individual Bell Telephone Companies. As a national buyer, I implemented the first national contracts for plastic conduit when first introduced into the Bell System. In 1974 dollars, those contracts exceeded $60 million.

November 19, 2008

TO: Vikie Bailey-Goggins
Oregon Public Utility Commission

FROM: Randy Dahlgren
Director, Regulatory Policy & Affairs

PORTLAND GENERAL ELECTRIC
UE 204
PGE Response to OPUC Data Request
Dated November 7, 2008
Question No. 014

Request:

Did PGE perform a cost-benefit analysis (NPV, other) to determine the most cost effective means (hatchery, SWWP fish passage, other) to ensure fish runs were adequate to meet the FERC's relicensing requirements? If so, please provide these studies.

Response:

PGE did not perform a cost-benefit analysis to determine the most cost-effective means to only meet FERC's fish passage requirements. The FERC license required that PGE meet both fish passage and water quality requirements. The SWWP will meet both requirements. The request mentions a hatchery as a possible alternative. However, a hatchery would not meet FERC's fish passage requirements.

PGE is constructing the SWWP as cost-effectively as possible to meet both fish passage and water quality requirements. PGE did perform a cost-benefit analysis to demonstrate that construction of the SWWP and continued plant operation is cheaper for customers than the alternative, which is not building the SWWP and no longer operating our Pelton and Round Butte plants. PGE included this cost-benefit study in its initial testimony in Docket UE 180. Pages 23-25 of PGE Exhibit 300 in that docket summarize the results of the study. Given information known in early 2006, the study concluded that meeting the FERC requirements by constructing the SWWP and continuing operations at Pelton and Round Butte had a net present value benefit to customers of approximately $540 million.

Attachment 014-A is an Excel file, which contains the analysis. The summary results begin in Cell DI-3 of the "Hydro" tab.

UE-204
Attachment 014-A

Provided Electronically (CD) Only

Excel File: Cost-Benefit Analysis

PGE Exhibit 306 Provided Electronically (CD) Only

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Administrative Hearings Division

PGE Exhibit 307C Provided Electronically (CD) Only

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Administrative Hearings Division

PGE Exhibit 308C Provided Electronically (CD) Only

DOCKETED

January 19, 2009

TO: Gordon Feighner
Citizens' Utility Board

FROM: Randy Dahlgren
Director, Regulatory Policy & Affairs

PORTLAND GENERAL ELECTRIC
UE 204
PGE Response to CUB Data Request
Dated January 14, 2009
Question No. 030

Request:

PGE accepted the lowest bidder as contractor for this project. How did the process account for the lack of a finished project design?

Response:

At the 25% design stage, it was necessary for PGE to partner with the design team and the contractor to manage costs and design complexities. Beginning work early in the design process with both the design team and the contractor was important to provide innovative construction methods to be incorporated early into the design, that reduced the risk of late changes or field changes; thereby minimizing costs.

Securing a contractor early in the process also assured PGE dedicated fabrication shop space in what was a very competitive construction market. Involving the contractor also improved the overall schedule by allowing for parallel activities such as completing detailed shop fabrication drawings, initial fabrication work, and geological field investigations.

The process and documentation for changes to the contract is detailed in PGE's Response to CUB Data Request No. 31.

January 04, 2009

TO: Vikie Bailey-Goggins
Oregon Public Utility Commission

FROM: Randy Dahlgren
Director, Regulatory Policy & Affairs

PORTLAND GENERAL ELECTRIC
UE 204
PGE Response to OPUC Data Request
Dated January 26, 2009
Question No. 042

Request:

Please provide support and discuss why PGE imposed the current timeline for completion of the SWW on Barnard Construction. Was this timeline required by the original FERC license articles? Within the original FERC license please provide specific language wherein FERC states that PGE must have full operation of the SWW by April 15th, 2009

Response:

The importance of the April 15th deadline to finish the SWW is discussed in PGE's Response to CUB No. 18 (copies of which were provided to the OPUC). The original FERC license required that the SWW be "operational" on September 13, 2007. This date was established by the mandatory conditions imposed by the National Marine Fisheries Service and the US Fish and Wildlife Service in Appendices C&D to the license, Condition 3. Those conditions are incorporated into the terms of the license by Ordering Paragraphs H and I of the License.

Condition 3 required that the Licensees comply with the schedule that was included in the Fish Passage Plan. That plan was included in the settlement as Exhibit D and was included in the license through Ordering Paragraph J and the conditions contained in Appendices C and D. The specifics of the schedule are contained in a Gantt chart that is Appendix VI to the Fish Passage Plan. That schedule (which has since been modified by agreement with the agencies) shows the SWW operational in the fall of 2007. (See Sheet 3 of 12)

Subsequent to the issuance of the license, the Licensees applied to FERC for an amendment to the license to "true up" the license conditions to match the design that was agreed upon with agencies and to amend the schedule. The schedule change also required agreement from NMFS and USFWS. The change moved the completion date for the SWW to May 2009. A further discussion of the importance of the April 15 completion is in PGE's Response to Staff's Data Request No. 43 and to CUB's Data Request No. 18. Both the amendment application and the FERC order approving the amendment are attached as PGE Attachments 042-A and 042-B.

UE 204
Attachment 042-A

SWW Application for License Amendment

UE 204
Attachment 042-B

FERC Order

January 4, 2009

TO: Vikie Bailey-Goggins
Oregon Public Utility Commission

FROM: Randy Dahlgren
Director, Regulatory Policy & Affairs

PORTLAND GENERAL ELECTRIC
UE 204
PGE Response to OPUC Data Request
Dated January 26, 2009
Question No. 043

Request:

Does PGE believe that fines would have been imposed if the SWW were not completed by April 2009? If so, please quantify these fines if the SWW were not completed until April 2010, or April 2011. In addition, would PGE have had to take additional steps with FERC and other agencies if the completion date of the SWW were not until April 2010 or April 2011? Please describe these additional steps in detail

Response:

Assuming that PGE acted in good faith, it is unlikely that fines would have been imposed if the SWW was not completed on time. FERC does have the ability to impose civil penalties for license violations; we do not believe that fines would have been imposed in this circumstance.

However, once the completion date was set, the biological components of the reintroduction effort were developed to match the construction schedule. As discussed previously in PGE's Response to CUB Data Request No. 18 (copies of which were provided to the OPUC), there are a number of components to the effort to reintroduce salmon and steelhead into the Middle Deschutes Basin upstream of the Pelton Round Butte Project. Our main involvement is the building of the SWW and Fish Transfer Facility to safely pass the juvenile salmon and steelhead downstream. There are many other fish habitat enhancement and smaller fish passage projects have been completed, are ongoing or have been planned to complement these efforts, to allow the fish larger areas to access, and to improve the capacity of the stream above our dams to rear these fish. One of the major components of this effort that the State, Tribal, and Federal fisheries agencies are involved in is the reintroduction itself. Hundreds of thousands of steelhead fry have been liberated into streams of the Deschutes and Crooked River basins upstream. Over 200,000 juvenile spring Chinook were liberated into the Metolius Basin streams last February. The timing of these releases was determined based on the completion date required by the license. The migration starts in March, and lasts through June. However, the peak downstream-migration period for these small fish is the last two weeks of April. The April 15th date was chosen because this will allow the majority of these small fish access through the project without substantial delay and increased mortality. Because these fish are only 4 to 8 inches long, substantial delay will create significant mortality and will mean that substantial effort and money has been wasted.

Because the schedule for completion of the SWW is contained in a condition mandated by NMFS and USFWS, it cannot be changed without their agreement. Which is to say, the necessary license amendment cannot be obtained without the approval of NMFS and USFWS. Therefore, in order to ask FERC to further amend the license to change the schedule, PGE would have to negotiate with NMFS, USFWS and other members of the Fish Committee to obtain their agreement. In light of the biological resources that would be damaged as a result of a delay, it is likely that the agencies would negotiate for some additional mitigation in exchange for agreement to a license amendment.

The process for obtaining a license amendment is detailed in volume 18 of the Code of Federal Regulations section 4.200 et seq.

February 6, 2009

TO: Vikie Bailey-Goggins
Oregon Public Utility Commission

FROM: Randy Dahlgren
Director, Regulatory Policy & Affairs

PORTLAND GENERAL ELECTRIC
UE 204
PGE Response to OPUC Data Request
Dated January 26, 2009
Question No. 044

Request:

Given the complexity of the SWW, the fact that a structure of this type had never been built, does PGE believe that a longer timeline for design and construction would have benefited the Company? Please discuss why or why not.

Response:

This initial overall schedule from design through construction was reasonable and achievable. As discussed below, the schedule had to be modified because the design engineering was more complex and time consuming than anyone expected.

The overall schedule was extended based on the change from the cheese wheel design to the final design. The schedule was revised and reviewed and determined to be reasonably achievable. Based on this revised design schedule, the negotiations for fabrication and construction were initiated in July 2006 to ensure the availability of the fabrication facility and the construction contractors. Securing the availability of the facility and contractors at such an early stage was necessary due to the high demand for fabrication facilities that could result in long delays in project completion.

Please see PGE's Responses to CUB Data Request No. 18 and OPUC Data Requests Nos. 42 and 43 for further discussion on the schedule.

This approach provided PGE the ability to receive information from the fabricator and construction personnel during the design stage to ensure the project was designed to address all aspects of the project, from fabrication through construction, and to minimize the risk and costs associated with redesigns. Redesigns potentially may have resulted in significant cost increases for design, fabrication, and construction.

It was not until late in the design process, as the final design issues were resolved, that it was determined that the design would be late and the schedule was modified month-by-month, from June to October 2007. This resulted in the delayed start of fabrication and construction activities. A revised schedule was developed and the contractors determined that they would be able to achieve the revised completion date.

Although the SWW design process took longer than expected, the final product was high quality, accurate and complete and would not likely have been changed or improved with an extended schedule. The changes seen since the design was finalized would have occurred in any event since they are a result of detailed reviews or field conditions determined during the subsequent activities including development of shop drawings, fabrication issues, and construction activities.

As noted above, the initial fabrication and construction schedule was reasonable and achievable and was based on the detailed construction schedule. In addition, it provided reasonable flexibility between construction completion and the requirement to collect fish in early spring and to meet our FERC commitment date of May 2009. The delay in this part of the schedule resulted in a tight but achievable schedule, and the contractors agreed that their scope of work could be completed in accordance with this schedule. This resulted in reduced schedule float and as things have progressed has resulted in schedule work-a-rounds and extra effort to maintain the schedule. However, this has not resulted in any loss of quality or function of the system.

In addition, assuming we complete on schedule, this will allow us to meet all of our commitments to the fish agencies and FERC and take full advantage of all previous actions taken to reintroduce salmonids above the project as noted in PGE's Response to OPUC Data Request No. 43 and PGE's Response to CUB Data Request No. 18.

And as noted in the FERC Order Modifying and Approving Fish Passage Facility Design, it will also allow us to meet the requirement in the water quality certificates issued by the State of Oregon and the Confederated Tribes Department of Natural Resources to initiate operation of the SWW by May 2009.

January 20, 2009

TO: Gordon Feighner
Citizens' Utility Board

FROM: Randy Dahlgren
Director, Regulatory Policy & Affairs

PORTLAND GENERAL ELECTRIC
UE 204
PGE Response to CUB Data Request
Dated January 14, 2009
Question No. 018

Request:

What, if any, incentive for finishing the project on-time has been promised to the contractor? What must the contractor have completed in order to earn this bonus? What, if any, costs will PGE incur if the SWW project is not in fact completed by April 15? Please assume delays from one day to three months in formulating your answer.

Response:

An incentive payment was negotiated with Barnard to finish the project by April 15, 2009. The specific terms of this agreement can be found in Attachment 025-B (Change Order 2), of PGE's Response to OPUC Data Request No. 25 (provided to CUB as part of PGE's Response to CUB Data Request No. 01). Attachment 025-B is confidential and subject to Protective Order 08-515.

PGE will incur no additional Barnard contract costs if the SWW project is not complete by April 15, unless the delay is the fault of PGE, at which point the contractor has the option to file a delay claim. More detailed information is available in the above referenced attachment.

Hundreds of thousands of steelhead fry have been liberated into streams of the Deschutes and Crooked River basins upstream in May 2007 and 2008. Over 200,000 juvenile spring Chinook were liberated into the Metolius Basin streams last February. These releases were made because we committed to our agency partners, fisheries conservation groups, and other stakeholders that we would have the SWW and Fish Transfer Facility completed to pass the juvenile fish downstream safely in the spring of 2009. The migration begins in March, and lasts through June. However, the peak downstream-migration period for these small fish is the last two weeks of April. The April 15th date was chosen because this will allow the majority of these small fish access through our dams without substantial delay and increased mortality. Because these fish are only 4 to 8 inches long, substantial delay will add to substantial mortality.

There will be no direct financial penalty if the April 15 date is not achieved. However, the Oregon Dept. of Fish and Wildlife, the Warm Springs Tribal Fisheries Branch, the U.S. Fish and Wildlife Service, and NOAA Fisheries, the fish agencies involved in this effort, have substantial power in their relationship with us. The two Federal fisheries agencies are especially important as they are the federal fishway prescription agencies, and all aspects of our fish passage program require their approval as they are implemented the next several years. We have a good working relationship with these agencies and they are counting on us having the facility operational to pass juvenile fish downstream this spring per our commitment.

The negotiation of the delay claim settlement discussed in PGE's Response to OPUC Data Request No. 33, (provided in PGE's Response to CUB Data Request No. 10) discusses the opportunity we had to reduce our delay claim, and simultaneously meet our commitment to complete the SWW in April.

January 20, 2009

TO: Gordon Feighner
Citizens' Utility Board

FROM: Randy Dahlgren
Director, Regulatory Policy & Affairs

PORTLAND GENERAL ELECTRIC
UE 204
PGE Response to CUB Data Request
Dated January 14, 2009
Question No. 031

Request:

What controls were in place to prevent contract scope creep? Please provide copies of any and all documentation relating to design or application of these controls.

Response:

PGE objects to this request on the basis that "any and all" is overly broad and unduly burdensome. Notwithstanding this objection, PGE responds as follows:

PGE maintains a full-time staff on site throughout construction and manages all interactions with the contractor, consultants, and agencies. PGE representatives have the authority to suspend or delay particular areas of construction whenever there is a violation of contract requirements. The project has developed a communication plan and all documents are maintained on a CH2M project web site called "Sharepoint". A copy of the communication plan is included as PGE Attachment 031-A.

The construction bids also used a fixed price method where possible, based on specific design documents and were considered "open book" pricing. As many pricing elements as possible are based on unit pricing, defined labor rates, etc., to provide a consistent cost and method for revising the pricing as the design evolved. The contractor provided a detailed revised price based on a detailed evaluation of each bid item showing the changes to the bid based on the final design and scope. These changes are reviewed and approved as appropriate on a bid item by item basis.

Any approved changes within the scope of the contract are documented by a Field Change Order. Documentation for changes to the design are discussed below. All of the changes based on revised bid items are completed via a Field Change Order. If the contractors have identified other work that is necessary, it is reviewed and approved as appropriate. Field Change Orders are utilized to document any additional work authorizations and/or contract changes that the contractors identify and complete including the appropriate justification. A Field Change Order is forwarded to the PGE Project Director for approval. All of the Field Change Orders and related memos to date are included in PGE's Response to OPUC Data Request No. 025, which was provided to CUB in PGE's Response to CUB Data Request No. 1.

If there is a design change, it is processed through a design change program labeled "memo", which requires an engineer review. These memos include the justifications and rationale for the design and/or cost changes. These memos are then reviewed by the contractor and any cost changes associated by these memos are then sent to PGE for review and approval. A Field Change Order is then processed as described above.

Any approved changes outside the scope of the contract are documented by a Change Order. The project manager must document the necessary changes in a Supplement, which is reviewed internally by PGE Management and approved as necessary. If approved, a Change Order is completed, thus modifying the contract.

UE 204
Attachment 031-A

Communication Plan

January 14, 2009

TO: Vikie Bailey-Goggins
Oregon Public Utility Commission

FROM: Randy Dahlgren
Director, Regulatory Policy & Affairs

PORTLAND GENERAL ELECTRIC
UE 204
PGE Response to OPUC Data Request
Dated January 5, 2009
Question No. 025

Request:

Please provide all contracts, invoices, and correspondences, in electronic and hard copy format, with the SWW contractor Barnard Construction.

Response:

PGE objects to this request as overly broad and unduly burdensome. Without waiving its objection, PGE responds as follows:

Attachment 025-A contains copies of invoices for Barnard Construction. Attachment 025-B contains a copy of the construction contract with Barnard Construction, including associated materials and subsequent change orders. Attachment 025-C contains a copy of the engineering contract with Barnard Construction, including associated materials and subsequent change orders. Attachments 025-A through 025-C are confidential and subject to Protective Order No. 08-515.

On January 8, 2009, Staff submitted Data Request No. 030 modifying the correspondence portion of OPUC Data Request No. 025. Correspondence will be provided in PGE's Response to OPUC Data Request No. 030.

UE 204
Attachment 025-A

Confidential and Subject to Protective Order No. 08-515

Invoices for Barnard Construction

UE 204
Attachment 025-B

Confidential and Subject to Protective Order No. 08-515

Barnard Construction Contracts

UE 204
Attachment 025-C

Confidential and Subject to Protective Order No. 08-515

Barnard Engineering Contracts

January 20, 2009

TO: Vikie Bailey-Goggins
Oregon Public Utility Commission

FROM: Randy Dahlgren
Director, Regulatory Policy & Affairs

PORTLAND GENERAL ELECTRIC
UE 204
PGE *Supplemental* Response to OPUC Data Request
Dated January 5, 2009
Question No. 025

<u>Request:</u>

Please provide all contracts, invoices, and correspondences, in electronic and hard copy format, with the SWW contractor Barnard Construction.

<u>Response (Dated January 14, 2009):</u>

PGE objects to this request as overly broad and unduly burdensome. Without waiving its objection, PGE responds as follows:

Attachment 025-A contains copies of invoices for Barnard Construction. Attachment 025-B contains a copy of the construction contract with Barnard Construction, including associated materials and subsequent change orders. Attachment 025-C contains a copy of the engineering contract with Barnard Construction, including associated materials and subsequent change orders. Attachments 025-A through 025-C are confidential and subject to Protective Order No. 08-515.

On January 8, 2009, Staff submitted Data Request No. 030 modifying the correspondence portion of OPUC Data Request No. 025. Correspondence will be provided in PGE's Response to OPUC Data Request No. 030.

<u>Supplemental Response:</u>

Attachment 025-B Supp 1 contains the page missing (page 2 of 6) from the Construction Contract Change Order No. 2. Attachment 025-B Supp 1 is confidential and subject to Protective Order No. 08-515.

UE 204
Attachment 025-B Supp 1

Confidential and Subject to Protective Order No. 08-515

March 31, 2009

TO: Patrick G. Hager
Manager, Regulatory Affairs

FROM: Judy Johnson
Program Manager, Rates and Tariffs

OREGON PUBLIC UTILITY COMMISSION
UE 204
PGE's First Set of Data Requests to OPUC
Dated March 20, 2009
Question No. 009

Request:

9. Please define "cost over-runs" as used in Staff Exhibit 200.

Response:

As described in Staff Exhibit 200 and used in Staff Exhibit 202, cost over-runs are defined as actual costs over budget. A formal definition of cost over-runs, as defined by dictionary.com (http://dictionary.reference.com) is "cost in excess of that originally estimated or budgeted, esp. in a government contract: *Additional funds had to be allocated to cover the cost overrun on the new fighter plane.*"

January 20, 2009

TO: Gordon Feighner
Citizens' Utility Board

FROM: Randy Dahlgren
Director, Regulatory Policy & Affairs

PORTLAND GENERAL ELECTRIC
UE 204
PGE Response to CUB Data Request
Dated January 14, 2009
Question No. 033

Request:

Please provide further detail related to the breakout of the $26 million increase set forth at UE 204 PGE/100 Keil-Schue-Hager/13. Please pay particular attention to the break out of the items labeled as "contingency". Please detail the cause of this $26 million increase in contract price.

Response:

PGE has performed two Risk Assessments for this project. One was a Failure Modes & Event Analysis (FMEA) and another Risk Assessment exercise was performed. Contingency costs were allocated based on the probably of the risk occurring. PGE also received a Recommended Contingency from the contractor and these risks were also factored in our contingency. The contingency amounts were derived using all of these sources.

The Risk Assessment is included as PGE Attachment 033-A. The FMEA is included as PGE Attachment 033-B. Attachments 033-A and B are confidential and subject to Protective Order No. 08-515. The recommended contingency from the contractor can be found on the "Recommended Contingency" column of the updated pricing schedule PGE provided as Attachment 031-B Supp 1, in PGE's Supplemental Response to OPUC Data Request No. 031, (see PGE's Response to CUB Data Request No. 10). Attachment 031-B Supp 1 is confidential and subject to Protective Order No. 08-515.

PGE Exhibit 105 detailed the $26 million increase and this exhibit has been updated with additional information where possible and is included as PGE Attachment 033-C. The updates are in section "Design Cost & Schedule Changes", beginning on page 3.

UE 204
Attachment 033-A

Confidential and Subject to Protective Order No. 08-515

Provided Electronically (CD) Only

Risk Assessment

UE 204
Attachment 033-B

Confidential and Subject to Protective Order No. 08-515

Provided Electronically (CD) Only

Failure Modes & Event Analysis (FMEA)

UE 204
Attachment 033-C

Updated PGE Exhibit 105

April 24, 2009

TO: Vikie Bailey-Goggins
Oregon Public Utility Commission

FROM: Randy Dahlgren
Director, Regulatory Policy & Affairs

PORTLAND GENERAL ELECTRIC
UE 204
PGE Response to OPUC Data Request
Dated April 14, 2009
Question No. 058

Request:

In PGE's response to Staff DR # 25 Attachment B, "Construction Contract", the contract states: "When PGE determines that the drawings and specifications are 90% complete, PGE will notify contractor, and Contractor will provide PGE with a proposed final contract price." Concerning this sentence;

A. Please provide PGE's written notification to the Contractor.
B. Please provide the Contractor's response to PGE's notification, which contains the proposed final contract price.
C. If PGE did not obtain a final contract price, please discuss why.

Response:

A. PGE Attachment 058-A is the letter that PGE sent to Barnard on September 7, 2007 requesting updated pricing at approximately 90% design completion. Attachment 058-A is confidential and subject to Protective Order No. 08-515.

B. PGE Attachment 058-B is the facsimile response received from Barnard with proposed pricing on September 28, 2007. The updated pricing spreadsheet is attached as PGE Attachment 058-C and the tab "Final Price" is the referenced update. PGE Attachment 058-C is confidential and subject to Protective Order No. 08-515.

   As stated in Attachment 058-B, the September 28th proposed pricing update does not include updated pricing for the FTF and Pipe Bridge, which states it will be provided on October 5, 2007. The final pricing for that portion of the design was ultimately provided later and incorporated in Change Order 2, which was provided as part of PGE's Response to OPUC Data Request No. 25. We then evaluated and negotiated the pricing on a line-by-line basis to finalize the fixed price for each line item.

The work papers ("backup") for the pricing referenced in Attachment 058-B are voluminous and confidential and are currently in Madras at the construction site. These work papers consist of three 11x17 binders and one additional 3 ring binder. These binders are each several inches thick and contain design drawings and explanations for pricing and other work papers. These work papers have been available to Staff and other parties during on-site visits and continue to be available for review at the Pelton work site.

C. Please see PGE's Response to (a) and (b) above.

UE 204
Attachment 058-A

Confidential and Subject to Protective Order No. 08-515

PGE Letter to Barnard

UE 204
Attachment 058-B

Barnard Response Facsimile Cover Sheet

UE 204
Attachment 058-C

Confidential and Subject to Protective Order No. 08-515

Provided in Electronic Format (CD) Only

9/28/07 Final Pricing Spreadsheet

January 16, 2009

TO: Gordon Feighner
Citizens' Utility Board

FROM: Randy Dahlgren
Director, Regulatory Policy & Affairs

PORTLAND GENERAL ELECTRIC
UE 204
PGE Response to CUB Data Request
Dated January 14, 2009
Question No. 019

Request:

Why, when, and at what cost (in terms of both time and money) was design and construction of the "cheese wheel" abandoned?

Response:

During the initial design process for the SWW structure, PGE engineering identified a design that was given the name "Cheese Wheel," due to the circular top structure of the facility.

PGE classified costs for work involving the engineering of the SWW to FERC 107 – Construction Work in Progress. Many tasks were involved in the engineering, one of which involved examining the "Cheese Wheel" format in more detail. By January 2005, this portion of the structure was removed from consideration due to several issues including seismic, structural, technical inability to perform as required, and the projected high cost. This cost was never fully developed since the design of the circular format of the structure was suspended.

The exhibits in Attachment 019-A show that the physical change was to the Selective Water Top –SWT, with structural simplifications to the Selective Water Bottom – SWB. Otherwise, a substantial portion of the structure with the circular structure was retained in the current structure.

Attachment 019-B identifies costs incurred through CH_2M for element design that have, or have not, been retained in the current structure. CH_2M uses task numbers to track activities which allows for identifying specific costs for inclusion or exclusion. Attachment 019-B is confidential and subject to Protective Order No. 08-515.

Costs relevant to the Cheese Wheel alone were approximately $168,466.34 (or $112,316.51 PGE Share). PGE experienced a delay in the engineering phase with the design change resulting in an increase to the agreement with CH_2M in the amount stated above, but did not experience any construction changes or delays as no schedule had been developed or contracts in place at the time of the decision.

UE 204
Attachment 019-A

Diagram of Physical Changes

UE 204
Attachment 019-B

Confidential and Subject to Protective Order No. 08-515

Costs

January 19, 2009

TO: Gordon Feighner
Citizens' Utility Board

FROM: Randy Dahlgren
Director, Regulatory Policy & Affairs

PORTLAND GENERAL ELECTRIC
UE 204
PGE Response to CUB Data Request
Dated January 14, 2009
Question No. 024

Request:

In the supplemental response to OPUC data request No. 369, PGE states that the cost for the cheese wheel design and construction (at a projected total cost of $87 million, with PGE's share being $58 Million) is not comparable to the cost of the SWW project design and construction (at a projected cost of $108 million, with PGE's share being $78 million). Is there a difference of function or scope between these two projects that makes them non-comparable?

Response:

There is little difference in function or scope between the two projects. The difference is in the design stages. As stated in PGE's Response to OPUC Data Request No. 369 in UE 180 (provided as work papers in PGE Exhibit 100), the cheese wheel design was at 25% completion at the time of the $87 million engineer's estimate. At the 25% design stage, not all of the issues have been identified and the costs associated with the 'not yet identified' issues were obviously not included in the 25% design stage cost estimate. This estimate is not comparable to the current design, which is essentially complete and most, if not all, issues have been identified.

A more accurate comparison would be the 25% engineer's estimate for both designs. The engineer's estimate for the current design at 25% was $40.5 million, or approximately $46.5 million less than the cheese wheel at the same design stage.

January 19, 2009

TO: Gordon Feighner
Citizens' Utility Board

FROM: Randy Dahlgren
Director, Regulatory Policy & Affairs

PORTLAND GENERAL ELECTRIC
UE 204
PGE Response to CUB Data Request
Dated January 14, 2009
Question No. 035

Request:

Barnard was the lowest bidder on paper. In practice is it possible that the final cost for the SWW project will be higher than the highest bid received? If so, what factors resulted in the change from the original to the final cost?

Response:

All three bidders received the same information for this project. All pricing by the bidders was compared to an engineer's estimate on the same design. It is unlikely that any of the other bidder's pricing would have been lower than Barnard's after the final cost of the SWW was determined. The changes as the design evolved that caused Barnard's price to increase were not unexpected and would have been encountered by all the other contractors; thus, their prices would have increased respectively.

Please refer to PGE's Response to CUB Data Request No. 31 for additional information on controls for contract changes and PGE's Response to CUB Data Request No. 30 for information about the importance of the contractor being involved prior to design completion.

January 20, 2009

TO: Vikie Bailey-Goggins
Oregon Public Utility Commission

FROM: Randy Dahlgren
Director, Regulatory Policy & Affairs

PORTLAND GENERAL ELECTRIC
UE 204
PGE Response to OPUC Data Request
Dated January 8, 2009
Question No. 033

Request:

Please discuss the issues, and agreement between PGE and Barnard construction associated with a PGE caused delay in September and October of 2007.

Response:

The dollar amounts of the delay claims and subsequent settlements are confidential. Please see PGE Attachment 034-A for a discussion of the related issues and agreements between PGE and Barnard Construction. Attachment 033-A is confidential and subject to Protective Order 08-515.

UE 204
Attachment 033-A

Confidential Subject to Protective Order No. 08-515

UE 204
Attachment 033-B

Confidential and Subject to Protective Order 08-515

Table 1. Comparison Rocky Reach versus Round Butte

	Rocky Reach	**Round Butte**
cfs	6,000	6,000
Fish Bypass	Floating	Floating
Gate Well Collection Issues	Yes	No
Selective Water Withdrawal	No	Yes
100% Exclusion	No	Yes
Prototyping	Yes	No
Surface Currents	Understood and Predictable	Unknown and Complex
Tributaries	1	3
Dam	Low-Headed	High-Headed
Operations	Seasonal[1]	Year-Round
Alternative Fish Passage	Spill	No
Fish Species	Understood	Unknown
Fish Migration	Understood	Unknown
Fish Numbers	Understood	Unknown
Fish Survival Rate[2]	92%	0-1%
Design Criteria Established	Yes	No
Construction Methods Established	Yes	No
Construction Materials Established	Yes	No
Construction Site	On Land	In Water
Construction Schedule	Approximately 24 Months	Approximately 19 Months
Qualified Bidders	1	3
Design Firm	CH2M Hill	CH2M Hill
Project Manager	Walter N. Bennett	Walter N. Bennett

[1] Approximately April 1st through the end of September
[2] Prior to solutions being implemented

March 12, 2009

TO: Vikie Bailey-Goggins
Oregon Public Utility Commission

FROM: Randy Dahlgren
Director, Regulatory Policy & Affairs

PORTLAND GENERAL ELECTRIC
UE 204
PGE Response to OPUC Data Request
Dated March 5, 2009
Question No. 049

Request:

In the format provided in PGE's response to Data Request No. 3, please provide the February through June 2009 forecasted costs. As a part of the response:

a. **Please provide a "Description" Column" and "PGE Share" column.**

b. **Please provide forecasted expenditures by anticipated month of expenditure.**

c. **Please provide a detailed breakdown of construction costs (Cost Element 49). Please list general category of cost (construction, retainage, contingency, incentive, penalty, etc.)**

Response:

PGE's Response to OPUC Data Request No. 3 was a download of historical transactions, which contained many columns that are not available in a forecast. We have tried to replicate the significant and relevant items in PGE Attachment 049-A.

PGE forecasts construction costs on a monthly basis, which are provided in Attachment 049-A, however as stated in PGE's Response to OPUC Data Request No. 017, PGE does not forecast total projects on a monthly basis. Attachment 049-A contains an informal forecast of construction costs only and does not include other costs, such as PGE loadings or AFDC. A forecast for those items can be found in PGE work papers provided with the revenue requirement update, filed on March 3. Attachment 049-A is confidential and subject to Protective Order 08-515.

UE 204
Attachment 049-A

Confidential and Subject to Protective Order No. 08-515

Construction Costs

March 12, 2009

TO: Vikie Bailey-Goggins
Oregon Public Utility Commission

FROM: Randy Dahlgren
Director, Regulatory Policy & Affairs

PORTLAND GENERAL ELECTRIC
UE 204
PGE Response to OPUC Data Request
Dated March 5, 2009
Question No. 052

Request:

Please provide a detailed breakout of the outstanding contingencies as they pertain to the updated 2009 actual costs, provided on March 3. Please also include fulfilled contingencies to date. Please discuss all outstanding contingencies and explain if PGE anticipates any changes in the contingency amounts prior to the close of book in June 2009. Are the contingencies included in PGE's final costs $78,250,000, as outlined in the updated testimony provided on March 3, 2009 to Staff?

Response:

PGE's Response to OPUC Data Request No. 49, Attachment 049-A, shows the dollar amounts for contingency on two lines: 'Contingency for Potential & Outstanding Cost Issues' and 'Project Management Contingency'. The first captures outstanding and potential issues related to the construction contract. The second provides an overall contingency for the project.

The construction contract contingency addresses the following items:

- Outstanding fabrication and construction cost requests to address design changes, scope changes, and other cost changes in relation to the initial bid documents. Potential cost: up to $2,797,778.
- Extra Work Order requests from the construction contractors for additional work requested to address design issues, additional work scope, and/or other PGE related impacts to their work for work completed to-date. Potential cost: up to $869,340.

- Potential cost increases for the construction contractors for additional work requested to address design issues, additional work scope, and/or other PGE related impacts to their work remaining to be completed. Potential cost: up to $1,050,000.
- Potential additional work by the detailing contractor to address emergent work items. Potential cost: up to $60,000.

The first two bullets in construction contingency are under review and are expected to be resolved in the next thirty days.

The Project Management contingency provides for unknown cost increases for the other areas of the project including design support and oversight, specialized engineering support for construction activities, and engineering and contractor support for the testing programs.

Fulfilled contingencies to-date relate to increased fabrication costs due to changes in material requirements and cost escalation, increased fabrication costs due to changes in design from the initial bid design, increased fabrication costs for design/scope changes after material fabrication packages were issued to the shop, costs related to schedule delays, and extra work orders requested to address field construction activities related to resolution of design issues, additional work scope, and/or other impacts.

As shown in Attachment 049-A, the 100% project cost is $106.9 million, which includes the contingencies discussed above. As the construction contract issues are resolved, any changes will be reflected in the overall Project Management Contingency.

March 31, 2009

TO: Patrick G. Hager
Manager, Regulatory Affairs

FROM: Judy Johnson
Program Manager, Rates and Tariffs

OREGON PUBLIC UTILITY COMMISSION
UE 204
PGE's First Set of Data Requests to OPUC
Dated March 20, 2009
Question No. 006

Request:

6. **What is Staff's understanding of a contingency in a construction project? How is the contingency amount determined? Is it ever adjusted?**

Response:

Staff's experience (i.e., Assistant Chief Engineer - USS Peoria; Chief Engineer – USS Puget Sound; Chief Engineer – USS Barbour County; Project Manager, Training Wing Construction – Sony Disc Manufacturing; Budget and Policy Manager – Oregon Employment Department) is that contingencies are used as a budgeting tool. A contingency is an event that may occur but that is not likely or intended; possibility (The American Heritage Dictionary). A contingency is a provision or reserve held by the project manager for possible changes in scope, unforeseen or extraordinary costs. It's purposes is to lower the risk of exceeding the original budget for a project.

When dealing with a project that has a long time-line, contingencies are built into the budget to ensure funds are available for unanticipated costs or changes in certain costs. Examples of unanticipated costs or changes in costs include, but not limited to: changes in material costs (i.e., steel, fuel); changes in labor costs; specification / testing changes; legal or regulatory requirements changes' milestone and critical path changes.

Based on Staff's experience, a contingency amount is typically determined in the initial phases of budget setting by the Project Management Team or Budget Supervisor. The contingency amount can be based on historical experience, a standard percentage rate, expected monetary value (using probability of risk and cost of impact of the risk), or other methods adopted by a company.

Contingency costs can have a major impact on project outcomes for the Project sponsor. If contingency costs are set too high it might encourage sloppy management or cause the project to be uneconomic. If contingency costs are set too low it may be too rigid and set an unrealistic financial environment causing a risk of safety or cutting too many corners. This can result unsatisfactory performance outcomes.

Staff's experience is that once a task is completed, the related contingency cost is redirected to other areas of the project's budget or removed from the project budget in order to be redirected to other construction budgets as needed. When a project is complete, contingency costs if not expended, are no longer germane.

January 15, 2009

TO: Gordon Feighner
Citizens' Utility Board

FROM: Randy Dahlgren
Director, Regulatory Policy & Affairs

PORTLAND GENERAL ELECTRIC
UE 204
PGE Response to CUB Data Request
Dated January 6, 2009
Question No. 002

Request:

Is this project unique – has a facility of this design and type been built anywhere else?

Response:

The design of the SWW is complex. The design is site specific, taking into account the configuration of the hydro project, the geology and the purposes of the structure. However, if we analyze the project with regard to its individual functions, it is not unique. The control of water temperature at hydro projects through the use of multi-level intakes is a well accepted practice and several equivalent facilities have been constructed around the western United States. Similarly, the use of v-screens to collect downstream migrating fish is also common practice.

January 30, 2009

TO: Gordon Feighner
Citizens' Utility Board

FROM: Randy Dahlgren
Director, Regulatory Policy & Affairs

PORTLAND GENERAL ELECTRIC
UE 204
PGE Response to CUB Data Request
Dated January 14, 2009
Question No. 039

Request:

Please provide copies of the background data, calculations, communications, and analyses (in any format or medium) that inform the probability percentages shown in the table in confidential attachment 033-A.

Response:

This risk assessment was completed in July 2005, early in the design stage to determine some of the major risks for the design, licensing, and construction of the project. The assessment was completed by a group of engineers and others associated with the project in a "brainstorming" session. The probability percentage is assigned by the group based on their knowledge and expertise at that point in time. The intent of the process is to identify the major potential risks and develop ways to monitor the risk and ways to eliminate, mitigate, and/or address the risk in some fashion so as to minimize the potential impact on the overall success of the project; and as such does not include the benefit of such future design/mitigation efforts.

February 4, 2009

TO: Gordon Feighner
Citizens' Utility Board

FROM: Randy Dahlgren
Director, Regulatory Policy & Affairs

PORTLAND GENERAL ELECTRIC
UE 204
PGE Response to CUB Data Request
Dated January 26, 2009
Question No. 041

Request:

Please explain the difference between the following statements and the probability percentages shown in the table in confidential attachment 033-a:

> **"the unlikely possibility that the project will not 'function as designed'."**
> **PGE response to Staff DR 9 (b)**

Response:

The probability percentages in the table in PGE Attachment 033-A were developed in a 'brainstorming' session fairly early in the process. The percentages identified are qualitative in nature. The goal of that session was to identify risks and relative magnitudes that should be considered in the context of construction and design. This goal is discussed more thoroughly in PGE's Response to CUB Data Request No. 039. The probability percentages cannot be translated directly to a conclusion that the overall structure has a high probability of not functioning as designed.

January 30, 2009

TO: Gordon Feighner
Citizens' Utility Board

FROM: Randy Dahlgren
Director, Regulatory Policy & Affairs

PORTLAND GENERAL ELECTRIC
UE 204
PGE Response to CUB Data Request
Dated January 14, 2009
Question No. 040

Request:

Regarding attachment 033-A, please define (in percentage terms) the level of fish passage that would be considered a "failure", resulting in the implementation of an alternate mitigation plan.

Response:

In the event that defined statistical measures of success are not met and all required steps have been taken to improve collection efficiency, the settlement agreement provides a detailed process for reaching the conclusion that fish passage is "infeasible" and an alternate plan of mitigation should be pursued. This determination is not triggered by any one statistic. Rather, it is linked to a long term evaluation of the overall success of the program in establishing harvestable, sustainable runs.

Specific elements of Attachment 33-A in relationship to license obligations and measures of success are discussed below:

Agency acceptance of the SWW design may not happen resulting time delay
The time period addressed here has already passed. The agencies accepted the SWW design and no delay occurred as a result.

Agency acceptance of the FTF design may not happen resulting time delay
The time period addressed here has already passed. The FTF design was accepted in a timely way and there was no related delay.

PGE and the agencies may never reach agreement on the successful performance resulting in continual mitigation costs.

As noted for this risk/contingency in the text of the PGE Attachment 33-A, the risk is less related to failure or success as it is the risk of future modifications. The performance of the SWW will be judged in 2 basic ways: hydraulic performance and biological performance. The hydraulic criteria that must be met are specified in Condition 6 of Appendices C & D to the License (incorporated into the License by ordering paragraphs H & I of the License). The hydraulic performance is comparatively easy to assess and is less likely to result in controversy. Nonetheless, there is a risk that the structure will not perform exactly as designed and that modifications will be required in order to comply with the hydraulic criteria specified in the license.

Biological testing is more complex and subject to more interpretation. As a result, there is a comparatively higher risk that PGE will be required to modify the structure in order to improve fish survival. Condition 2(b) of Appendices C & D to the License (incorporated into the License by ordering paragraphs H & I of the License) requires that the Licensees achieve 93% smolt survival, measured from Round Butte collection to the lower river release point, in the first 5 years of operation. We are required to achieve 96% smolt survival after the first 5 years of operation. If we fail to achieve those standards, it will be necessary to reengage with agencies to reach agreement on modifications to the fish passage and collection systems.

Fish never find the forebay

There are a number of reasons that fish may not "find the forebay." Few of them have anything to do with the SWW. Condition 2(b) of Appendices C & D to the License (incorporated into the License by ordering paragraphs H & I) specifies a target of 50% of a statistically significant sample of tagged steelhead or spring Chinook outmigrants from any project tributary must reach the forebay. That target changes to 75% survival of PIT-tagged smolts calculated as a rolling 4 year average beginning after the first 5 years of SWW operation. The license requires that we collect information regarding the SWW's effect on reservoir currents. If that information indicates that reservoir currents are not in fact similar to those predicted by the modeling, the Licensees will consult with agencies to determine if there are any feasible modifications to the SWW that would enhance necessary reservoir currents. In addition, life-cycle modeling has shown that reservoir survival is a key component in the successful establishment of harvestable, sustainable runs. Therefore, poor reservoir survival may be a contributing factor in a determination of "infeasibility."

Fish make it to the forebay but reject the SWW

The license conditions do not specify a percentage of fish arriving in the forebay that must be entrained in the SWW and collected for transport. However, the facility is designed so as permit the addition of pumps should it be determined, in consultation with resource agencies, to be necessary to improve fish attraction.

PGE's Response to CUB Data Request No. 040
January 30, 2009
Page 3

Hydraulic performance in the FTF results in unacceptable levels of fish injury

As discussed above, the conditions of the license impose a survival standard for downstream migrating smolts that is measured from the point of collection at Round Butte dam to the release point in the lower Deschutes river. Because this standard encompasses all facility components, there is no "unacceptable level" of fish injury, per se, at the FTF. Fish injury and mortality are evaluated at every aspect of fish collection and transport. To the extent there is injury or mortality related to the FTF, that information will be presented to the resource agencies and we will consult with them regarding possible modifications to FTF structures or procedures.

January 15, 2009

TO: Gordon Feighner
Citizens' Utility Board

FROM: Randy Dahlgren
Director, Regulatory Policy & Affairs

PORTLAND GENERAL ELECTRIC
UE 204
PGE Response to CUB Data Request
Dated January 14, 2009
Question No. 025

Request:

What if any studies conducted by fisheries biologists and engineers, both internal and external to PGE, show that there is an "unlikely possibility that the project will not function as designed"?

Response:

PGE objects to this request on the basis that it is overly broad and unduly burdensome. Without waiving its objection, PGE responds as follows:

It was the considered opinion of the fish agencies signing the Settlement Agreement, as well as of the Joint Licensees, that the SWW would function as designed and would fulfill its two key functions: water temperature control and downstream fish passage. The SWW proposal was originally contained in the draft Fish Passage Plan included in the Final Joint Application Amendment (FJAA) that the Joint Licensees filed with FERC in June 2001. The SWW proposal was the product of years of consultation with the Fish Technical Subcommittee, the predecessor of the current Fish Committee. This consultation is summarized in the FJAA.

As the centerpiece of the Fish Passage Plan, the SWW proposal was based not only on studies "internal and external to PGE," but also on the accumulated expertise and judgment of the National Marine Fisheries Service ("NOAA Fisheries") and the Fish and Wildlife Service ("FWS"), as reflected in their Section 18 fish passage prescriptions, and of the Oregon Department of Fish and Wildlife ("ODFW"), as reflected in its Final

Unified State Position. The Fish Passage Plan was revised and included as Exhibit D to the Settlement Agreement. The 71 references, on which it is based, including studies, are listed starting on page 96. The FWS preliminary Section 18 prescription was filed in November 2002 and included a set of references, some of which were also included in the Fish Passage Plan. The NOAA Fisheries preliminary Section 18 prescription was also filed in November 2002, and included a separate set of references. The FUSP was filed on November 12, 2002, and also included supporting references. Together, these references form the basis of the conclusion that the SWW will function as designed.

The above reference documents are attached as PGE Attachments 025-A through 025-E.

UE 204
Attachment 025-A

Provided Electronically (CD) Only

PELTON ROUND BUTTE PROJECT
FISH PASSAGE PLAN

UE 204
Attachment 025-B

Provided Electronically (CD) Only

XIII. FISH PASSAGE DISCUSSION, COMMENTS, AND PRELIMINARY SECTION 18 PRESCRIPTIONS FOR FISHWAYS

UE 204
Attachment 025-C

Provided Electronically (CD) Only

Final Unified Position of ODFW

UE 204
Attachment 025-D

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NOAA Fisheries Preliminary Section 18

UE 204
Attachment 025-E

Provided Electronically (CD) Only

FWS Preliminary Section 18 References

PGE Exhibit 332 Provided Electronically (CD) Only

May 18, 2009

TO: Vikie Bailey-Goggins
Oregon Public Utility Commission

FROM: Randy Dahlgren
Director, Regulatory Policy & Affairs

PORTLAND GENERAL ELECTRIC
UE 204
PGE *Supplemental* Response to OPUC Data Request
Dated November 7, 2008
Question No. 004

Request:

Did PGE assign a separate job number or other indicator that would identify the costs attributed to water quality function and costs attributed to the fish passage function of the SWWP? Please explain.

a. If not, how is PGE able to determine the costs between the two functions? Please explain.

b. What is PGE's estimate of the SWWP cost if the SWWP was only installed for water quality and did not include a fish passage function? Please explain.

Response (November 19, 2008):

No. Only one job number was assigned to the SWWP.

The SWWP is based on an integrated design that meets FERC license requirements for both water quality and fish passage. Stated in economic terms, the water quality and fish passage attributes are joint products of one design. Therefore, SWWP costs do not neatly separate into two parts, one for water quality and another for fish passage.

Given this integrated design, many parts of the SWWP are for both water quality and fish passage functions. Therefore, for much of the project, it is not possible to separate costs by these functions.

a. If not, how is PGE able to determine the costs between the two functions? Please explain.

As noted above, many of the costs are joint, and therefore cannot be separated into only one of the two functions. However, Attachment 004-A is an Excel file that lists costs related only to fish passage. These sum to approximately $8.6 million (PGE share; see Cell I-430). The Attachment 004-A calculations do not include AFDC. They are a subset of the $71.9 million figure in Cell AB-3 of the “SWW AFDC” tab contained in the “SWW Revenue Requirement (2).xls” file included in the non-confidential work papers provided with PGE’s initial filing in this docket.

b. What is PGE's estimate of the SWWP cost if the SWWP was only installed for water quality and did not include a fish passage function? Please explain.

It is not possible to answer this question because PGE did notdevelop/design an SWWP that would only perform the water quality function. The FERC license required both the water quality and fish passage functions. Therefore, we did not develop a design that would meet only the water quality function, and it is not possible to estimate the cost of a “water quality only” SWWP.

Supplemental Response (May 18, 2009):

PGE inadvertently marked Attachment 004-A as non-confidential in its initial response. Upon further review, this attachment contains sensitive and proprietary information related to Barnard and should be considered confidential. PGE hereby designates PGE Attachment 004-A as confidential and subject to Protective Order No. 08-515.

UE-204
Attachment 004-A

Confidential and Subject to Protective Order No. 08-515

Provided Electronically (CD) Only

Excel File: Fish Passage Only Capital Costs

January 15, 2009

TO: Gordon Feighner
Citizens' Utility Board

FROM: Randy Dahlgren
Director, Regulatory Policy & Affairs

PORTLAND GENERAL ELECTRIC
UE 204
PGE Response to CUB Data Request
Dated January 14, 2009
Question No. 011

Request:

Did PGE include any O & M costs in the October 14, 2008 request for recovery of costs associated with the Selective Water Withdrawal Project?

Response:

PGE included revenue sensitive costs (OPUC fees, uncollectible expense, and franchise fees) based on the factors approved in UE-197. These costs total approximately $419 thousand dollars (See PGE Exhibit 101). In addition, PGE included depreciation expense, property tax expense, and income tax expense as described in PGE's response to CUB data request No. 28. Other than these amounts, PGE did not include any O&M costs in its request for recovery of costs associated with the SWW project.

UE 204 / PGE / 400
Bennett

BEFORE THE PUBLIC UTILITY COMMISSION

OF THE STATE OF OREGON

Benchmark

PORTLAND GENERAL ELECTRIC COMPANY

Rebuttal Testimony and Exhibits of

Walter Bennett

September 25, 2009

Table of Contents

I. Introduction

Q. Please state your name and position.

A. My name is Walter Bennett. I am employed by CH2M Hill, the company that was hired as the design consultant for the Selective Water Withdrawal project (SWW). I am the lead consultant on the SWW and I was also the lead consultant on the Juvenile Fish Bypass Facility at the Rocky Reach Dam. My qualifications are discussed further in Section VI.

Q. What is the purpose of this testimony?

A. The purpose of this testimony is to rebut Staff's assertion that the Juvenile Fish Bypass Facility at the Rocky Reach Dam is an acceptable benchmark to PGE's SWW project. I also discuss the necessity and rationale for the Construction Management/General Contractors (CM/GC) contracting method used in the selection of the SWW primary construction contractor.

Q. How is your testimony organized?

A. In Section II, I discuss the reasons why Rocky Reach is not an acceptable benchmark to the SWW, including the differences between the projects. In Section III, I review the rationale for the CM/GC methodology and specifically how it applies to the SWW contractor selection as well as the Value Engineering process. In Section IV, I discuss cost evaluation for the SWW project and also address Staff's concern that there are no cost assurances in the Round Butte contract. In Section V, I discuss the competitive bidding process. Finally, in Section VI, I list my qualifications for this testimony.

II. Rocky Reach Is Not an Adequate Benchmark

Q. Staff believes that the Fish Bypass Facility at Rocky Reach is a comparable benchmark to PGE's Selective Water Withdrawal (SWW) and makes the assumption that PGE should have performed the design and construction contract process in the same manner as Rocky Reach. Do you agree?

A. No. As I discuss below, the project at Rocky Reach is very different from the SWW project at Round Butte and is not a reasonable benchmark. These two projects are complex in their own ways and there is a justifiably different rationale for each project's methodology throughout design and construction. It would not be appropriate to use the same design and construction process for these two projects.

Q. What was your role with the Rocky Reach project?

A. In 1999, I was the design manager during the design phase, where I was responsible for ensuring that all the drawings and specifications were completed. Once the project moved into the construction phase, I became the project manager and remained so throughout construction.

Q. What is your role at Round Butte?

A. I am the project manager at Round Butte and have held that role throughout the project. I also held the role of design manager until the final design phase. Afterward, during the construction, I remained the project manager.

Q. How is Rocky Reach similar to Round Butte?

A. They are similar in magnitude and similar in function. By similar in function, I mean the dewatering screens at Rocky Reach have a capacity of 6000 cubic feet per second (cfs) and the dewatering screens at Round Butte also have a capacity of 6000 cfs and they both collect fish. Another project with these same similarities cannot be found anywhere else. That makes them very similar in terms of one of their shared purposes.

Q. Is Rocky Reach an appropriate benchmark in comparison to Round Butte?

A. No. While they are similar in this one purpose and there are elements of Rocky Reach that can be compared with Round Butte, Rocky Reach is not an appropriate benchmark.

Q. Are there significant differences between the two projects?

A. Yes. Rocky Reach is just a fish bypass, not a water temperature control facility, and in addition to surface collection, it has gate well collection. Round Butte has water temperature control, fish collection, and total exclusion[1] as the three main objectives. Rocky Reach does not have exclusion as a criteria so it is quite different than Round Butte despite having similar magnitude and purpose.

Q. Why did the Rocky Reach project not have to address total exclusion?

A. Rocky Reach is a low-head dam. As a result, passage through its turbines does not kill many fish. Rocky Reach does have fish-free areas where the water is screened off and the fish are not allowed, but the consequence of fish getting into fish-free areas is not as severe since the fish that pass through the turbines still have approximately a 90% chance of survival. Furthermore, it is unrealistic to try to screen the entire flow of the Columbia River.

Q. In comparison, what is Round Butte's rate of fish survival?

A. Round Butte is a high-head dam and the turbine passage survival rate is likely 1% or less. The penstock is so pressurized, approximately 400 feet of head, that when a fish goes through the turbine, it cannot survive the rapid change in pressure. Thus for high-head

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[1] Total exclusion means that all of the water is screened before it goes into the powerhouse. This ensures that no fish are killed in the turbines.

dams, to protect fish, the fish need to be excluded from the passing through the turbines by screening all powerhouse flow.

Q. Are there further constraints that make it difficult to compare Round Butte to the Rocky Reach project?

A. Yes. Rocky Reach has one tributary upstream between Rocky Reach and Wells Dam so the surface currents were understood and did not need to be changed. The currents were augmented some with the collector that was installed, but that was fairly predictable based on the models and prototyping and not too complex. Round Butte, by contrast, has the additional complication of three rivers entering the reservoir at different temperatures. The surface currents at Round Butte are complex and require complex modeling to determine how best to construct and operate the SWW in order to draw the fish to it for collection.

Q. Are the operations the same at Rocky Reach and Round Butte?

A. No. Round Butte is a 12-month a year program. In other words, that structure is continually passing fish whenever the fish are there and the powerhouse is generating. Power generation periods vary daily but generally there is a night time outage each day where the powerhouse is not generating electricity. There are always the issues of total exclusion and temperature control, in addition to fish collection. In contrast, Rocky Reach's fish bypass program only operates from approximately April 1^{st} into September, with some variance of those dates, from year-to-year. The system at Rocky Reach operates 24-hours a day during the fish passage season and then is turned off completely the remainder of the year. The two projects have very different power generation and spill requirements.

Q. Was minimizing spill one of the primary objectives for Rocky Reach to create more efficient fish bypass?

A. Yes. Rocky Reach had the alternative of "flushing" fish past their project by spilling water over the dam. This is a completely different scenario than Round Butte since spill would not effectively bypass fish at Round Butte.

Q. There are also differences between these two projects when they were bid. The Rocky Reach project was bid at the 100% design stage, whereas the Round Butte project was bid at the 25% design stage. Why were the two projects bid at different stages?

A. Although these two projects have similarities, Staff has overlooked significant differences between them that require different treatment in the bidding process. Rocky Reach had been prototyping solutions since 1992 and was able to do so because of the shallow water, easy access, multiple powerhouse units, and land available for construction. The construction methods and materials and design criteria had been well established by the final design phase. This was one of the main reasons Rocky Reach was able to bid at the 100% design stage. There were fewer questions to be answered in terms of constructability, such as what the structure would look like or how it would be erected. There were still questions about the cost of the project but that did not require as much input from the contractors during design.

Q. Was the contractor involved with designing the Rocky Reach project?

A. In general no, but there was one element of the project design that was left to the discretion of the contractor, which was the erection of the pump station. That design was not finalized until after the contractor provided their proposal on how to construct it due to the complexities involved in construction.

Q. Staff implies that Round Butte could have reached the 100% design stage prior to bidding. Would this have been beneficial to the project?

A. No. We received three bids at the 25% design stage and those three bidders chose three different methods of construction. All three bidders were provided the same design and two of the three rejected the SWW construction method. These two bidders proposed solutions that were more expensive at the bid stage and would likely have escalated further.

Q. So what would have happened had PGE bid the project at 100% design?

A. If this project was bid at 100% design, we would have either received higher bids, received non-responsive bids, or we would have had to evaluate many different alternatives. In my experience, I believe if we had waited to bid at 100% design stage we would likely have had to re-design and re-bid the project.

Q. Do you agree with Staff that PGE could have better managed and potentially avoided a majority of unforeseen cost over runs if they had taken additional time in the design phase? (Staff Exhibit 200, page 3)

A. No. First, let me again clarify that these were <u>not</u> cost over runs. These were design changes that were unforeseen at the 25% design stage that added cost, but no additional amount of time would have avoided them. Even if bid at 100% design stage, all of these design changes would have been necessary. We still would have encountered the same issues and would still have needed to find solutions for them, and they still would have increased the cost of the project. The difference is we would have had to address these issues without relevant cost input from the contractor to help define the most cost effective solutions. There was not a way around those problems and certainly more time would not have solved them. In fact, the likely re-design and re-bid of the project that would result from waiting until the 100% design stage would have increased the costs further.

Q. Staff indicates that a delay in the schedule would have provided PGE the opportunity to reach a greater design stage for bidding purposes. Would this have been more appropriate than bidding at the 25% design stage? (Staff Exhibit 200, page 12)

A. No. The appropriate time to get a contractor involved in the SWW was after the schematic design or 25% design stage. That was the appropriate time to receive input and it was not time dependent. As a matter of fact, PGE extended the whole project an entire year after the first design (cheese wheel) was evaluated and then abandoned in 2004. PGE spent another year working with the engineer and agencies to reach the 25% design stage for the alternative, SWW. Thus, I believe that PGE did take the appropriate time to design the best possible solution for the SWW.

Q. Please describe the benefits of bidding the project at the 25% design level.

A. Throughout the Round Butte design project, we were learning about constructability issues. Because of the complexity of the proposed structure, with the unique combination of fish passage and water quality, we found it beneficial to investigate constructability issues with selected contractors; what certain contractors were willing to do, what contractors believed they had experience with, what they thought was expensive, etc. The best way for PGE to take advantage of contractors' experience and knowledge was involve the contractor early in the project by bidding after the schematic (25%) design stage and ask for this sort of information.

Q. Can you provide instances where bidding at the 25% design stage provided benefit?

A. Yes. One instance is that the 25% design had the left abutment at Round Butte as the primary staging area. This is a very tight corner by the anchor block with a steep hillside. All three contractors rejected using the left abutment as the primary staging area because some of the hillside would have had to be excavated. Another example is the concrete base floats for the top structure. We discovered in the bidding process that two of the three bidders were either not able to receive bids from the concrete float suppliers or they were not willing to accept those bids. Thus, only one of the three contractors was successful in receiving what they determined was an adequate price for that work. That response was pivotal to how we decided to move forward. It is something we would not have known if we had gone to 100% design prior to bidding. In essence, we would have bid at 100% design and received one responsive bid.

Another benefit was that by having a contractor involved early we were able to fast track some of the work by starting fabrication while we were still in the design process.

Q. Staff states that Rocky Reach had a shorter construction schedule and implies that PGE should have been able to have a comparably shortened schedule to reduce overhead. (Staff Exhibit 200, pages 16-17) Was the schedule for Round Butte reasonable?

A. Yes. When we issued the schematic drawings we had an expected duration and all of the bidders agreed that the schedule was reasonable given the information at the time. The project price (or expected cost) was based on the schedule, so at the schematic drawing stage, we locked into a schedule and the costs associated with that schedule. But, when it became necessary to change the schedule, it also became necessary to adjust the costs related to that change, in accordance with the provisions of the open-book agreement. Extending the schedule had overhead costs associated with it that were spelled out in the bid documents. There were also considerations given to add additional resources. Again, the bid documents spelled out what equipment rates were to be used and helped confirm when it was cost effective to bring in more equipment and when it was not. The contractor was tasked with looking for these cost saving and schedule saving alternatives throughout the design process and into the construction phase. Where changes to benefit the project were made, the bid document rates were used to establish the change order price as much as possible.

Q. Were other schedules proposed?

A. No, not during the bid process. None of the bidders offered an eight-month schedule or offered a schedule delay that would provide greater cost savings. That implies that the schedule we proposed was the best solution for the project at the time and that there was no benefit of delaying or shortening the schedule.

Q. Was PGE prudent in allowing the schedule to change?

A. Yes. The changes were based on design changes, not over runs and as mentioned above, these design changes were not avoidable. There is always risk in managing schedule impacts of design changes made during the final design as there are risks of managing schedule changes during construction. It was inevitable that there would be pressure to extend the schedule as the design was completed and changes occurred, but considerable effort went into holding the schedule where possible and compressing it where there was benefit.

Q. Did other factors affect the schedule at Round Butte?

A. Yes. The schedule at Round Butte was driven by access to the water and the necessity to build in the water, whereas the majority of construction at Rocky Reach was performed on shore simply because there was more room to work at Rocky Reach. There were times at Rocky Reach when the contractor had two barge cranes and three or four land cranes all working simultaneously because there was more space and, thus, more areas in which to work. At Round Butte, there was one land-based crane and one barge crane for the duration of construction due to the space constraints. See PGE Exhibit 401 for an illustration of the site differences between Rocky Reach and Pelton/Round Butte.

Q. Why was Rocky Reach successful in keeping to an eight-month schedule?

A. Well, Rocky Reach was not really an eight-month schedule. That contract was quite different because there had been years of prototyping work at Rocky Reach, and thus, we knew much more about it. In addition, the "contract" itself was really nine contracts. Five of the contracts were pre-purchase contracts. These pre-purchase contracts provided significant funding for long lead items that allowed us to compress the schedule. There were two site-preparation contracts, one for each side of the river, and then two main contracts, again one for each side of the river. The full duration of those contracts from the first bid document to the final completion of construction was 30 months rather than eight.

Q. From where does the "eight-month" schedule for Rocky Reach come?

A. Rocky Reach has a strict in-water work window. Equipment can only be in the water certain times of the year and that drove Rocky Reach to an eight-month schedule for in-water work. The eight months could not have lengthened so any work that was not accomplished in that eight month window would have had to wait until the next season. Thus, the schedule for in water work would have lengthened from eight to 20 months.

Q. Did the prototyping at Rocky Reach help minimize the overall construction schedule?

A. Yes. Rocky Reach had been prototyping solutions at the dam since approximately 1992. Some of the items that were prototyped were actually just removed, refurbished, and returned, resulting in less fabrication time for final construction.

Q. Why did Rocky Reach start prototyping solutions at the dam several years in advance?

A. Rocky Reach's owner and operator, Chelan County Public Utility District (CCPUD), was aware they had to re-license the dam shortly and that fish passage would be an issue. The pressure to address fish passage intensified when salmon were listed under the Endangered Species Act. Fish passage and specifically surface collection of fish was in an early stage of development and CCPUD felt it was important to prove out concepts before investing in a permanent system. There were few if any successful systems in place at the time to use as a starting point.

Q. Were there different fish bypass elements that added to the difference in schedules between the two projects?

A. Yes. Rocky Reach was already passing fish when the bypass was built. Due to their prototyping, they also had a good understanding of the fish species and how many were trying to pass the reservoir. They were trying to improve their passage numbers in order to reduce the amount of spill necessary. At Round Butte, there were greater unknowns, fish passage was not yet occurring. In addition, we had to try and capture (and exclude) every fish.

The whole concept of reestablishing currents and collecting fish, and having to touch every single fish while doing this year round was a far greater task at Round Butte. Round Butte has no history of fish passage and the estimates of fish numbers were uncertain. They had some idea of how many bull trout were in the lake but they did not know how many of those would migrate down stream. These types of issues and details make a comparison of the two design schedules inappropriate.

Q. Please provide an example of the prototyping done at Rocky Reach.

A. One example is the prototyping of an attraction facility or fish collector, what is now referred to as a surface collector. Rocky Reach used power house flows to create a draw of water through the dewatering structure, to collect surface-oriented fish. What they discovered was that by placing the dewatering structure in the forebay directly in front of unit number 1, they started successfully collecting a large number of fish in the unit number 1 prototype intake screen that had previously been ineffective. So much so that gatewell collection became a major component of the final design. Prior to the prototyping effort, it was believed the gatewell collection system would be abandoned. It turned out the hydraulics under the dewatering structure vastly improved gatewell collection. They did not know what components would eventually combine to create a successful fish passage system, but they did know that every time they did something different in the forebay to collect fish, they learned something new from it. Each year they would target some improvement to their prototype system in an attempt to improve their percentage of fish passing through the bypass. Every summer for four or five years they would identify changes and we would then have the fall to design them, and the winter to build them, so that by April they were in place for a full season of testing.

Q. Were most of the prototypes successful?

A. No, but there was a lot of discovery in the process. They finally reached the point where they had built enough and had enough success that they felt they could easily extrapolate the results into a permanent system. At this stage, they were willing to tear out all the temporary work and build a permanent system with some confidence that they could meet their objectives for fish passage.

Q. Rocky Reach spent approximately 7 years prototyping and essentially testing elements of design for their final Fish Bypass. Were the costs of those prototypes in the final cost of the project?

A. No. Rocky Reach spent tens of millions of dollars prototyping solutions at the dam. However, the final construction package for both schedules and all the pre-purchase contracts was over $100 million and did not include the dollars spent on prototyping.

Q. Was PGE able to use the same approach as Rocky Reach?

A. No. Rocky Reach is a much better site for prototyping. The water is shallow and they have excellent land access. Round Butte has a deep pond and poor access. Hence, any prototyping of the SWW structure would be very expensive and time consuming. Rocky Reach also has eleven turbine/generator units, each with their own intake, so outages could be scheduled around construction without major impacts on generation. At Round Butte, there is only one intake and outages are very expensive.

Q. Did PGE do any prototyping at Round Butte?

A. Yes. PGE did have one prototype solution at Round Butte, which was a screen algae test. A small box was built and a pump was attached to the back of it drawing water through some of the different punch plates to determine what effect the algae in the lake had on flow through the different screen patterns.

Q. Why were no other prototypes attempted at Round Butte?

A. The configuration of the structures that had to be built for Round Butte made prototyping those solutions impossible. The construction of a prototype in approximately 270 feet of water did not make sense from a cost perspective.

Prototyping surface collection was not feasible because thousands of cfs needed to flow through the surface collector to get any meaningful data on changes to the forebay currents. Putting a small 500 cfs surface collector on the lake would have been a waste of time. The only way to generate flow of thousands of cfs is to either put in a huge pump station, which would have been cost prohibitive, or to tie the surface collector to the powerhouse and that involves tying it to the intake. This is no longer prototyping, but rather is simply building costly structures that cannot be easily discarded.

Q. Please summarize your position.

A. The use of the Fish Bypass at Rocky Reach as benchmark for the SWW at Round Butte is entirely unreasonable. There are many significant differences that required the projects to be designed and constructed in different ways. There were many constraints at Round Butte such as site space and river currents that were not factors at Rocky Reach. Additionally, Rocky Reach had the benefit of many years of prototyping before they decided how to construct their bypass system. PGE could not shorten their construction schedule to reduce costs, or be assured of lower costs by bidding their project at 100% design with the constraints they were facing. To look at the Rocky Reach project and conclude that PGE was imprudent because they should have mimicked Rocky Reach in design and construction is simply inaccurate. These projects are not comparable from that standpoint.

III. Construction/Contract Type

Q. Please summarize your position regarding PGE's contract method used for the Round Butte Project.

A. PGE was prudent in its approach in using the CM/GC contract and in its use of open book pricing. The use of open-book pricing and the evolution of the cost as the decision evolves does not constitute a price over run as referenced by Staff. These were all decisions that were made to the best resolution and progression of the SWW project, and as the project manager of both the Rocky Reach and the Round Butte projects, I agree with these decisions and believe that the contract methods are prudent and appropriate for this project. In terms of trying to understand the difficulties and risk involved in this type of project, the Baker project is a more appropriate benchmark. And it is probably a more accurate benchmark since it is a floating surface collector. Baker was a far simpler project than Round Butte because they were dealing only with surface collection; they did not have water quality issues and total exclusion was not provided. Nonetheless, it cost proportionally far more than Round Butte per cfs of dewatering. The owner of the Baker project changed the design consultant at approximately the 30% design phase after completing Value Engineering (VE) studies in an attempt to contain costs. In the end, the completed floating surface collector (FSC) failed to meet much of the hydraulic design criteria and needed to be modified after the first year of operation in 2008. The difficulty they had was reflective of the complexity of these types of projects.

Baker had a number of advantages over Round Butte. They had done prototyping at Baker and had experience with fish collection. Additionally they had construction yard areas that could be used as a dry dock so the structure could be built on land instead of over the water. Even with these advantages their project costs were high as compared to the Round Butte SWW.

Q. Are Baker and Round Butte similar in size?

A. No. Baker is a 500-1000 cfs surface collector, whereas Round Butte is a 6000 cfs surface collector. The surface collector at Baker is nearly as large in footprint (60' x 130') as the Round Butte surface collector (90' x 150'). And considering it is 1/6th of the flow capacity, the surface collector at Baker, costing approximately half ($50 million[2]) of what Round Butte's surface collector cost, represents a much higher price per cfs, when compared to Round Butte. Support for Baker's specifications is included in workpapers.

A. Value Engineering (VE) Study

Q. Staff claims they are unclear why it was necessary to bid the project early in order for the contractor to have input in the design when Barnard "made numerous mentions of it's ideas already being incorporated into the project" (Staff Exhibit 200, page 13). Were Barnard's ideas incorporated into the project before it was bid?

A. In part. Barnard had a small amount of participation in the VE study for the SWW.

Q. Please describe the VE process.

A. In late 2004, the Senior Review Board met to evaluate the cheese wheel design. After that review meeting and based on the estimated costs of that design concept, PGE determined that the cheese wheel design was no longer cost effective. Thus, the cheese wheel concept was abandoned and the design process was re-initialized, which led to a formal VE Study. The VE Study consisted of two days of systematic analysis of the functions, processes and

[2] Source http://www.pse.com/SiteCollectionDocuments/mediaKit/045_Baker_Hydro.pdf

original criteria of the SWW with a focus on identifying new concepts and revised design criteria that could potentially reduce costs. That led to the preliminary design of the current project and a considerable reduction in cost.

Q. Is there a misunderstanding of Barnard's role in the VE process?

A. Yes. Staff's testimony seems to suggest that the VE Study was an ongoing discussion—but it was not. Barnard was a member of the VE team and they had a very short period of input during the VE Study. They were not consulted again until they were selected as the contractor.

During the two-day VE study, Barnard helped develop some concepts at the very basic level, but the concepts were bare-boned.

Q. Did PGE have the ability to receive more input from Barnard for the 25% design phase?

A. Possibly, but we had no contractual relationship with them and had no further discussions with them.

B. Construction Manager/General Contractor (CM/GC) Contract

Q. Staff states that a CM/GC contract was not the ideal contract for Round Butte and a more traditional design-bid-build contract, such as the one used for the Fish Bypass at Rocky Reach, would have been more appropriate. Do you agree?

A. No. As I discussed above, there were many reasons why the projects at Rocky Reach and Round Butte are not comparable, and those reasons are also why different contracting methods were necessary.

Q. Is the Round Butte contract a standard CM/GC contract?

A. Yes and no. The contract for Round Butte is most similar to a CM/GC contract. The main difference is that the SWW contract did not have a traditional guaranteed maximum price. Instead, all contractors provided estimates that included unit prices that were to hold through project construction (i.e., open-book). That would not necessarily be the case with a conventional CM/GC contract.

Q. What costs were agreed upon in this open-book agreement?

A. The open-book agreement established labor costs, material costs, mark-ups, fees, and the costs of most of the items that could be established and set at that time. There was a large incentive to try to lock-in material costs and material purchases as early as possible because at that time commodity prices were increasing by 20% to 30% a year. The bids provided for escalation factors for steel and most of the material because a contractor would not have been in a position to guarantee prices on those materials. But, in general, we knew what the project would cost, with the exception of escalation, with the given schematic design. As the design would become more complete, we expected some costs to increase, but the input prices, as noted above, were fixed.

Q. Are the updates to the open book pricing what Staff refers to as cost over runs?

A. It appears so. However, these are not cost over runs. These changes in price are cost increases as a result of the change in scope of the project due to design evolution. The contractor did not change pricing midstream, with the exception of escalation, or incur some over-budget costs, as the term over run would suggest.

Q. Why were changes made in the scope of the project?

A. Feasibility issues in design predominantly drove changes in scope. The 25% design package had an outline of structures but the analysis was not complete at that point and these were not simple, conventional structures. When the design did not function as we thought it might in certain areas, design accommodations had to be made. It is not unusual when designing a structure that has never been designed before to make professional estimates in terms of what the structure will look like, how big it will be, and what it will cost. And then, the work has to be done in order to determine if the assumptions were correct.

For example, in the case of Round Butte, we actually had quantities of steel for all the major elements listed at the 25% design stage. And those quantities of steel prevailed all the way to the end of final design for several of the structures. Some of the other structures, such as the bottom structure, became significantly heavier since more steel was added once we began to understand how it behaved. That is the discovery of the design process. It is not realistic to think that all the answers can be known before the design is complete.

Q. Staff points out that PGE did not use a Guaranteed Maximum Price (GMP) in their contract and suggests that doing so would have allowed PGE to share in the cost risks with the contractor. Is the open book pricing similar in nature to GMP?

A. Yes, open book pricing is similar to GMP in its functionality. The purpose of the open book pricing is to fix pricing where possible and to allow the contractor to document any other changes in pricing that are necessary. The manager, such as PGE, is able to review and approve any changes to the pricing before it is accepted. In essence, this is was the best way to fix the price and minimize the risk of price increases outside the scope of the project, which is also the purpose of GMP. The open book pricing allowed us to estimate the cost of scope changes and allowed PGE to better negotiate changes, since the costs had already been established. This is discussed in more detail in PGE Exhibits 300 and 500.

Q. Why was a traditional GMP not appropriate for the SWW project?

A. GMP is associated with more routine work where the overall price of the project can be forecast with some certainty. In my experience, a GMP for this project was not appropriate, nor would it have lent any value. For a project of this size and complexity, forcing a contractor to provide a GMP would have simply resulted in a very high GMP, because the unknowns and, therefore, the risks inherent with this project were high. A very high GMP in this situation actually would likely not hold the contractor to cost controls. The open book pricing does a better job of controlling costs in this situation by requiring justification and review of every cost increase.

C. Liquidated Damages versus Incentives

Q. Staff makes an indirect comparison of the liquidated damages clause for the contractor at Rocky Reach to the incentive offered the contractor at SWW (Staff Exhibit 200, page 18) and implies that liquidated damages are more appropriate than an incentive. Do you agree?

A. No. An incentive for completing the project on-time versus a liquidated damages penalty for not completing on-time basically provides the same motivation.

Staff suggests, though, that liquidated damages are more onerous on the contractor than an incentive, but this is not necessarily correct. Contractors in a bidding environment with very few bidders will simply add the liquidated damage to the bid amount, in effect changing the liquidated damage into an incentive. In the case of Rocky Reach, there were liquidated damages of approximately $2 million for final completion; however, as I understand it, the contractor had added the expected amount to its bid and, thus, received what in reality was an incentive when they completed on time. The contractor has no reason to take on the risk of liquidated damages unless there are many responsive bidders, and Rocky Reach had only one qualified bidder.

Q. If the contractor is able to essentially change liquidated damages into an incentive, why add it to the contract?

A. In the case of Rocky Reach, the reason liquidated damages were added to the contract is that the project needed to be finished in the spring when migrating fish arrived. The only way to ensure a spring completion was to have some sort of incentive or damages clause in the contract.

Q. Why didn't PGE initially have an incentive or damage clause written into the contract until after the first delay?

A. When a contract is bid at 100% design stage, as at Rocky Reach, there is one chance for leverage and an incentive or damage clause needs to be in place to ensure the schedule does not drift. When a contractor is involved at the 25% design stage, and there is an open-book agreement, there is more room for negotiating the completion date. Some time after the contractor was selected, both parties decided to create an incentive to finish by April 15, when most of the fish were expected to arrive at the dam.

Q. So in the case of Rocky Reach, liquidated damages are no more beneficial than an equivalent incentive, is that correct?

A. Yes. Either one can be used to achieve the same objective which is keeping the project on schedule and the costs to the owner would have been basically the same.

Q. Why was an incentive or damage clause necessary since there were no penalties if the project was not completed by April 15, 2009?

A. PGE needed to make a good faith effort to reach the April 15, 2009 deadline as part of the stipulation with other parties. PGE Exhibit 300 discusses this topic in greater detail.

Q. Were there additional benefits related to the type of contract PGE used?

A. Yes. By involving the contractor early in the design process, we were able to secure dedicated shop time for the steel fabrications.

Q. As the project manager of both the Rocky Reach and Round Butte projects, did you recommend that each project use a different contract method?

A. Yes, but it was not my recommendation alone. There were a number of people involved in making the decision on both projects, including the client and the engineers. We had the same design firm on both projects, however, each project team arrived at a different contract structure recommendation.

CCPUD and PGE are both sophisticated clients. They have performed and/or managed several large construction projects and they know how to contract that work. It was apparent to PGE, as well, that the Round Butte project required a different type of process than Rocky Reach.

It is also worth noting that one of the members of the senior review board for the Round Butte project was Ben Gerwick. Mr. Gerwick was an internationally recognized professional in heavy civil and marine construction projects. He was part of a very well-respected firm and he himself was highly respected. During a senior review meeting, he advised PGE that Round Butte would require a qualified contractor, working with the design team to address the risks of the project. He recommended a variant of the CM/GC approach. PGE had already been considering this approach but Mr. Gerwick's advice was validation that the Round Butte project demanded something different than the Rocky Reach project.

D. Fabrication Shop Time

Q. Staff states that they were "unable to verify" PGE's claims that securing dedicated shop time for fabrication was part of the reason to use a CM/GC contract, and points out that advanced securing of shop time wasn't necessary at Rocky Reach (Staff Exhibit 200, page 14). Why was securing dedicated shop time necessary for the Round Butte Project since Rocky Reach did not require this as part of its contract?

A. These projects were constructed in completely different time periods. Although it might seem that space at fabrication shops would not change significantly from 2002 to 2007, it did. By 2007, material was no longer stored in warehouses awaiting customers. Indeed, it was extremely difficult to procure steel compared to 2002 and prices had become much more volatile.

In fact, all three of the contractors at the 25% design stage not only recommended that they procure shop space, but they insisted on it, and each had an agreement with at least one fabrication shop as part of their bid to ensure availability and the best price. By negotiating in advance, a fabrication shop could be guaranteed a certain amount of work and they would then be more willing to provide some concessions. Naturally, that shop would also have agreed to meet the project's schedules.

Q. Is it fair to say that Rocky Reach did not have these same constraints in terms of securing shop time for fabrication?

A. No. The contractor for Rocky Reach did have trouble securing shop time for fabrication because of the eight-month construction schedule at Rocky Reach and because shop time was not secured in advance. The contractor was forced to secure shop space from five separate steel fabricators in order to fabricate the volume of steel through their shop in the amount of time they had for the Rocky Reach project.

There were also some contractual issues getting those different fabricators lined-up on that project. The contractor went into fabrication and still did not have a contract with one of the shops that was fabricating, which lead to a claim at the end of the project.

In other words, the Rocky Reach project would have benefited by securing shop time as a component of the contract, as was done by PGE for the Round Butte project.

IV. Cost Evaluation and Cost Assurance

A. Cost Evaluation

Q. Staff states that "once cost estimates for the SWW were known to be significantly greater than originally estimated, PGE did not perform any additional analysis to determine whether the project, or more importantly, its selected approach, was the most cost effective means of achieving the requirements." (Staff Exhibit 200, page 5) Do you agree with this statement?

A. No. PGE evaluated dozens of alternatives and the relative costs prior to designing the cheese wheel. Also, as I noted previously, when the cheese wheel became uneconomic, PGE went back to the drawing board and came up with a different design, the SWW. After moving to the new design, PGE continued to emphasize cost savings.

Q. Can you provide an example of costs being reduced?

A. Yes. The first major reduction in cost was a change in the biological criteria after we completed the initial study. The agencies had originally specified some criteria that would not have allowed for the structure we eventually constructed. We were able to show the agencies that they were getting marginal benefit from some of the criteria they desired and that by relaxing those criteria, we could reach the same result, but with a substantially less expensive structure.

However, most of the cost reductions on the project were smaller items since after this point we were locked into criteria. These criteria had requirements such as the square footage of screens or the square footage of surface area, which made further cost reductions difficult.

Q. Did the recommendation to have the contractor involved early provide cost savings?

A. Yes. The 25%-50% design stage is where a client can have the most influence over costs and this is why we recommended that PGE involve a contractor early in the design process. The contractor's involvement between the 25% and the 50% design stages was much more intense than it was between the 50% to 100% design stages because the major decisions with the largest cost implications were made during the early design phase. Once the 50% stage (or later) is reached, there is little opportunity to significantly influence costs. An example of this was the decisions regarding the type of piles and drilling methods to be used to anchor the Selective Withdrawal Bottom. Barnard was going to do the drilling and was able to define the best method for drilling in deep water and the associated pile types and sizes that worked with that method.

B. Cost Effectiveness

Q. Staff states that they have no assurance "that this project was built in a cost effective manner" (Staff Exhibit 200, pages 9 and 10). Is this claim reasonable?

A. No. As I understand Staff's standards for achieving assurance, almost no major construction project is capable of providing such assurance. There is simply no way to prove that a project was built for minimum costs, just as there is no evidence that the Round Butte project could have been built for less. Based on my experience and the complexities of the SWW project, PGE's decisions on design and management of the project were reasonable. Thus, I believe the project was cost effective. In fact, Staff's suggestions regarding alternative ways to manage the SWW project would have likely made the project more costly.

V. Competitive Bidding

Q. Staff mentions that, due to the nature of the type of contract PGE used, it is difficult to determine what contractor would have ultimately been the lowest bidder. Do you agree?

A. No. The two higher priced contractors both rejected the 25% design concept, which would indicate that if they had bid the way we designed it, their bids would have been higher than Barnard's. They were encouraged to submit these alternatives in an effort to capture cost reduction and I presume that the contractors submitted alternatives because they thought they were less expensive than if they used the 25% design.

Q. Does Staff have a misperception about the value received from competitive bidding?

A. Yes. There is a great deal of risk associated with a project like Round Butte. This risk will influence how the pricing is established by the contractor since they are being paid to manage and take on these significant risks and they are significant in value.

The risks of the Round Butte project were largely identified at the 25% design level and there were no contractors willing to bid on the project at a "bargain" price. However, we did receive good feedback from the three contractors regarding their approach to risk and their appetite for risk. If we would have waited until the 100% design stage before bidding, I do not believe we would have received the same kind of feedback.

In my experience with projects that are bid at 100% competitively, the lowest bidder is generally put in a position where they are trying to recover what was left on the table, meaning the difference in price between them and the next lowest bidder. The lowest bidder usually takes a fairly aggressive stance towards change orders and towards change conditions and anything else that might justify those changes. Competitive bidding does not make a project immune from cost changes. To some extent, we have avoided this because we locked-in some of the pricing at the 25% stage. We had fees established with some understanding of what those fees were going to cover so the contractor for Round Butte was not motivated to dispute every change. I believe PGE avoided much of the contention and much of the claim action that would have occurred had they pursued a more conventional route.

Q. Staff claims that PGE relied heavily on the experience of the bidders and weighed the outcome in favor of more experienced bidders rather than weighing the bids solely on costs (Staff Exhibit 200, Page 8). Is this correct?

A. Yes, but I do not believe this should be viewed negatively. There are only a few contractors who are capable of performing this type of high-risk work. Thus, giving more weight to experience was appropriate and necessary. To ignore experience in order to try and lower costs would be inappropriate and could be counter-productive.

VI. Qualifications

Q. What is your profession and background?

A. I am a principal structural engineer and senior project manager employed by CH2M Hill who specializes in the area of water resource engineering structures including dams, hydroelectric projects, fish bypasses, irrigation and power water intakes. I am an expert on environmental engineering concrete structures and underwater steel and concrete construction. I received my B.S. in Civil Engineering from Washington State University and have completed graduate course work in Structural Engineering at Washington State University.

Q. What is your relevant experience?

I am currently serving as project manager for construction services of PGE's fish collection and Selective Water Withdrawal structure at Round Butte Dam. Structural analysis included, response spectra analysis, time history analysis, and push over analysis of structures with significant hydrodynamic effects. I was the senior structural reviewer for the tailrace fish barrier at Soda Spring Powerhouse on the South Umpqua River in southern Oregon. I was the Project Design Manager and Senior Structural Engineer, Design Phase, Construction Manager, Construction Phase, for the Rocky Reach Juvenile Fish Bypass System. This project received the ACEC 2004 Engineering Excellence National Grand Award. I was the Senior Structural Engineer for the Trashrack replacement for Rock Island Dam. This project included dynamic modeling of the new and existing trashracks and field verification of vibration levels in place. I was the Senior Structural Engineer at the Lower Granite Dam for the g modifications to the behavioral guidance structure owned by the

Corps of Engineers. This structure is an 1,100-foot-long floating curtain that guides fish away from the powerhouse intakes.

I also designed floating concrete trash booms at Little Goose Dam, Bonneville Dam Powerhouse No. 1 and Rocky Reach Dam. I acted as the project manager and senior structural reviewer on a series of air entrainment reduction projects at Rock Island Dam including flip aprons designed to reduce the plunge below the gate and over/under gates design to reduce the entrainment. I was responsible for senior structural review of the Design Development Report (30 percent design) or the Dalles Lock and Dam Sluiceway Outfall/AAW. I was the Lead Structural Engineer at The Dalles Dam for the Northshore Fishway Hydroelectric Project. Also, please see PGE Exhibit 402 for a full list of my qualifications and work experience.

Q. Do you have other experience that relates to this docket?

Yes. I have considerable experience with structural design and construction support for water and wastewater treatment plants throughout the northwest. The list comprises many of CH2M Hill's signature projects in this area including the West Point Waste Water Treatment Plant in Seattle, and Marine Park Waste Water Treatment Plant and Expansion Projects in Vancouver.

Q. Do you have other professional experience related to Selective Water Withdrawal?

A. Yes. I have testified for the plaintiff on the fish screen failure at Twin Falls hydroelectric facility in North Bend, Washington.

Also, I have co-authored three articles regarding selective water withdrawal, "Round Butte Selective Water Withdrawal Seismic Study," was published in the *International Society of Offshore and Polar Engineering*, 2008; "Selective Water Withdrawal and Fish

Collection at Round Butte Dam," was published in *WaterPower XIV*, 2007; and "Designing a Selective Water Withdrawal Tower for Seismic Forces" was published in *WaterPower XVI*, 2009.

Q. Does this conclude your testimony?

A. Yes.

List of Exhibits

PGE Exhibit	Description
401	Rocky Reach and Pelton/Round Butte Photographs
402	Walter Bennett's Resume and Qualifications

PGE Exhibit 401 Provided Electronically (CD) Only

Walter N. Bennett S.E.

Principle Structural Engineer and Senior Project Manager

Education

B.S., Civil Engineering, Washington State University, 1977
Graduate Course Work, Structural Engineering, Washington State University

Professional Registrations

Professional Engineer: Washington, 1982, #20623
Structural Engineer: Washington, 1987
Professional and Structural Engineer: Oregon, 2001, #67210PE
CH2M HILL Certified Project Manager: 1995

Distinguishing Qualifications

- Structural engineer with more than 30 years' experience working on dams, hydroelectric projects, reservoirs, irrigation and raw water intakes, fish screens and fish passage and other water resource related structures
- Project Manager for the Round Butte Selective Water Withdrawal project

Relevant Experience

Mr. Bennett is a principle structural engineer and senior project manager who specializes in the area of water resource engineering structures including dams, hydroelectric projects, fish bypasses, irrigation and power water intakes. Mr. Bennett is an expert on environmental engineering concrete structures and underwater steel and concrete construction.

Representative Project Experience

Portland General Electric, Round Butte Selective Water Withdrawal Structure. Currently serving as project manager for construction services of PGE's fish collection and selective water withdrawal structure at Round Butte Dam. This structure will be a first of a kind steel and concrete floating fish collector and bypass combined with a selective water withdrawal structure built in 270-feet of water depth. Structural analysis included, response spectra analysis, time history analysis, and push over analysis of structures with significant hydrodynamic effects.

Structural Review, Soda Springs Tailrace Fish Barrier, PacifiCorp. Senior structural reviewer for the tailrace fish barrier at Soda Spring Powerhouse on the South Umpqua River in southern Oregon. This structure is designed to be erected in one summer season in the narrow canyon downstream of the powerhouse through the extensive use of precast concrete and prefabricated steel elements.

Project Design Manager and Senior Structural Engineer, Design Phase, Construction Manager, Construction Phase, Chelan County Public Utilities District, Rocky Reach Juvenile Fish Bypass System, Wenatchee, Washington. Recently finished work on this project. The new technology used on this project involves the use of fish screens and a pump station to collect juvenile fish into a bypass pipe that is diverted past the turbines. This design involved a great deal of underwater construction on the upstream face of the

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powerhouse and complex fish screening technology. This project received the ACEC 2004 Engineering Excellence National Grand Award.

Senior Structural Engineer, Chelan County PUD, Rock Island PH #2 Trashrack replacement. The trashracks at Rock Island Dam failed soon after the first installation in 1968. The redesigned racks have performed well for many years but have lead to higher than normal head losses through the racks expecially during the milfoil season. Chelan County PUD was looking for a new rack design that would avoid the vibration problems that failed the first installation but were smooth on the face to allow for mechanical cleaning and more hydrodynamic to allow for less drag. Both needs were accomplished with new racks that were mated to the existing supports and installed underwater. This project included dynamic modeling of the new and existing trashracks and field verification of vibration levels in place.

Senior Structural Engineer, Lower Granite Dam Behavioral Guidance Structure, Walla Walla District USACE, Washington. Senior structural engineer and reviewer for the upcoming modifications to the behavioral guidance structure owned by the Corps of Engineers. This structure is an 1,100-foot-long floating curtain that guides fish away from the powerhouse intakes.

Trash Booms, Little Goose Dam, Bonneville Dam Powerhouse 1 and Rocky Reach Dam, Washington. Designed floating concrete trash booms at Little Goose Dam, Bonneville Dam Powerhouse 1 and Rocky Reach Dam. This system, first used at Rocky Reach dam uses a concrete float and wooden or plastic fence to skim surface debris in the forebay to reduce the amount of trash handled in front of the intake units and to protect fish migration.

Entrained Air Reduction, Rock Island Dam. Mr. Bennett acted as the project manager and senior structural reviewer on a series of air entrainment reduction projects at Rock Island Dam including flip aprons designed to reduce the plunge below the gate and over/under gates design to reduce the entrainment. Both showed measures of success but the over/under gates met more of the Districts operating objectives. The District currently has two of their 31 spill gates modified for over/under spill gates. These required the design of new gates as well as the design of modified gates. Additionally, flow shaping elements were designed to be added under water to improve the flow characteristics and reduce air entrainment.

The Dalles Lock and Dam Sluiceway Outfall/AAW, Portland District USACE, Oregon. Responsible for senior structural review of the Design Development Report (30 percent design). Juvenile fish bypass project, estimated at $40 million, included design of 540-meter-long concrete flume to convey flow from existing sluiceway to a more desirable discharge point downstream. Upper end of the flume included dewatering of flow and adding it to the existing adult fishway attraction water system.

Lead Structural Engineer, The Dalles Dam Northshore Fishway Hydroelectric Project, The Dalles, Oregon. Lead structural engineer for the addition of a 4.8-MW powerhouse on an existing fishway system beg operated by the Corps of Engineers. This project also

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included 2,400 square feet of wedge wire screens at the intake to the powerhouse to protect downstream migrating fish.

Lead Structural Owner's Representative, North Wasco PUD, McNary Fishway Hydroelectric Project, McNary Dam, Washington. Provided preliminary design layout and criteria as the owner's representative for this small hydroelectric turbine added to the fishway auxiliary water supply system on the north shore of McNary Dam.

Senior Structural reviewer, City of Sacramento, Freeport Raw Water Intake and Pump Station. Currently reviewing the 200 MDG raw water intake for the City of Sacramento and East Bay MUDD in the Sacramento River. This pump station features a screened intake with 1800 square feet of fish screen and a sediment removal system in the pump bay. Construction will start in late 2006.

Senior Structural Reviewer, Sutter Mutual Water Company, Tisdale Positive Barrier Fish Screen Pumping Plant Project, Meridian, California. Recently finished the design of this project that involved the addition of a new positive barrier fish screen at an existing irrigation diversion on the Sacramento River. The existing system has two pumping facilities that supply the irrigation canal.

Senior Structural Reviewer, Natomas Mutual Water Company, Sankey and Elkhorn Intake. Currently acting as senior structural reviewer for two irrigation water intakes equipped with positive barrier fish screens.

Senior Structural Reviewer, Reclamation District No. 108, Combined Pumping Plant. Currently acting as senior structural reviewer for two irrigation water intakes equipped with positive barrier fish screens.

Senior Design Consultant, Chin Chute Hydroelectric Powerhouse, Alberta, Canada. Senior design consultant for the addition of a 11-MW hydroelectric facility to an irrigation system being operated by the St. Mary's River Irrigation District in Canada. The irrigation water is now being bypassed through the powerhouse rather than having its energy dissipated at the Chin Chute.

Design Engineer, Kingsley Dam, Nebraska. Design engineer and resident engineer during construction for the 50-MW hydroelectric powerhouse. This powerhouse was added to an earth fill dam built in the 1930s and included over 500 feet of 19-foot-diameter steel penstock liner placed inside an existing concrete tunnel.

Lead Structural Engineer, Centralia Diversion Dam Renovations, Centralia, Washington. Lead structural engineer for project to replace an old wood crib dam with a concrete ogee shape. Modifications were made to the intake structure fishway.

Lead Structural Engineer, Tumwater and Dryden Dam Renovations, Chelan County PUD, Washington. Lead structural engineer for renovations. The fishladder at Tumwater Dam was renovated. At Dryden Dam, an RCC gravity dam section was added to stabilize an existing wood crib dam; a fish trapping facility, fish screens on the irrigation canal, and fish ladder renovations were designed.

Walter N. Bennett S.E.

Environmental Engineering Concrete Structures. Mr. Bennett has considerable experience with structural design and construction support for water and wastewater treatment plants throughout the northwest. The list comprises many of CH2M HILL's signature projects in this area including the West Point Waste Water Treatment Plant in Seattle, Marine Park Waste Water Treatment Plant and Expansion Projects in Vancouver and the Cedar River Water Treatment Plant.

Expert Witness
Provided expert witness testimony for the plaintiff on the fish screen failure at Twin Falls hydroelectric facility in North Bend, Washington.

Awards / Commendations

Accepted ACEC 2004 Engineering Excellence National Grand Award as Project Manager for the Rocky Reach Juvenile Fish Bypass Project.

Publications / Presentations

Co-authored the reinforced concrete design chapter for CH2M HILL's in-house *Structural Design Guide*, which is used on CH2M HILL design projects involving reinforced concrete.

Contributed to ACI 350-06, Code Requirements for Environmental Engineering Concrete Structures, as the committee chair for the structural concrete committee.

Yang, G; Rogge, M; Li, J; Isaacson, M; Bennett, W, and Allyn, N, (2008) *Round Butte Selective Water Withdrawal Seismic Study,* International Society of Offshore and Polar Engineering.

Sweeney, C; Marshall, K; Bennett, W, and Carson, P, (2007) *Selective Water Withdrawal and Fish Collection at Round Butte Dam,* WaterPower XV.

Bennett, W, and Carson, P, (2009) *Designing a Selective Water Withdrawal Tower for Seismic Forces,* WaterPower XVI.

BEFORE THE PUBLIC UTILITY COMMISSION

OF THE STATE OF OREGON

Contracting

PORTLAND GENERAL ELECTRIC COMPANY

Rebuttal Testimony and Exhibits of

Steven Pinnell

September 25, 2009

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I. Introduction

Q. Please state your name and position.

A. My name is Steven Pinnell. I am the President and founding partner of Pinnell Busch, Inc, a project management and construction consulting firm in Portland. I have over 30 years of experience managing design and construction projects. I have been a construction consultant specializing in project management services since 1975. I have worked on numerous projects using alternative contracting methods and have written articles and provided training related to alternative contract methods.

Q. What are your qualifications to testify on this issue?

A. I am an expert in construction contracting methods and alternatives, including design-bid-build, agency construction management (CM), at-risk construction management (CM/GC or CM/GMP), design/build, turnkey, and other means of contracting for the design and construction of public works and other projects. I am also a recognized expert in construction estimating and accounting, scheduling, value engineering, dispute resolution, marine and heavy construction, and management of design and construction projects. My qualifications are listed in more detail at the end of this testimony.

Q. How did you prepare for this testimony?

A. I visited the Selective Water Withdrawal (SWW) site, which is in a remote location in the Central Oregon high desert, to examine the project, review the current status of construction, and verify the difficult site conditions. I took photographs and toured the facilities. While there, I discussed the project, its history, and key issues with PGE's project staff, who provided me with additional photographs and project documents. I returned to the site a second time to review additional documents and have since spoken to PGE's project team several times by phone. I also met with PGE staff at PGE headquarters in Portland, in addition to speaking at some length with Mr. Bennett of CH2M Hill, who was the project manager for both the construction of the Rocky Reach Fish Bypass facility and the design of the SWW.

The documents I reviewed included: (1) the Round Butte SWW Value Engineering Study dated January 31, 2006, (2) OPUC Staff Exhibit 200, (2) portions of the project schedules prepared by Barnard Construction, (3) the Executive Summary of the Design Basis Report, (4) Mr. Doug Sticka's chronology spreadsheet, which tracked events and construction contract amounts, (5) an untitled list and description of scope changes made during the project, (6) PGE's December 2008 Newsline newsletter and other public documents describing the project, (7) summary data on the post-VE SWW concept, (8) emails and schematics of the original 'cheese-wheel' design, (9) the written testimony of Ms. Keil, Mr. Schue, and Mr. Hager, (10) an earned value report prepared by the PGE project team, and (11) PGE responses to CUB data requests. I also briefly examined Change Order No. 2, various pricing schedule spreadsheets, and the Oregon Public Contracting Coalition Guide to CM/GC Contracting (PGE Exhibit 501), in addition to conducting a brief confirming survey of contractors and project owners on current CM/GC practice.

Q. Please summarize your findings.

A. Based upon my experience, I found that PGE was prudent in managing the project. It was appropriate to use the CM/GC method and the cost increases from the 25% design budget were the result of necessary design changes to meet conditions that were not evident at an earlier point in time. Those cost increases would have occurred regardless of the contracting method. It is also my opinion that the cost would have been greater had the project been constructed using a traditional, design-bid-build contract for construction.

Q. What is the purpose of this testimony?

A. The purpose of this testimony is to rebut Staff's testimony that the CM/GC contract methodology is an inappropriate contracting method for PGE's SWW project. Specifically I cover the following points:

- I review and explain the 3 main types of contracting: 1. design-bid-build, 2. design/build, and 3. construction management by a general contractor (CM/GC). I also review the application of CM/GC contracting to the SWW project.
- I demonstrate that the designation of the cost increase as a "cost over-run" by OPUC Staff is incorrect because the cost increase occurred during the design phase in response to an expansion in scope. Further, the percentage cost increase from the early design budget is not unusual for a state-of-the-art project of this complexity and is commensurate with the expansion in scope.
- I explain the purpose of a Guaranteed Maximum Price (GMP) in CM/GC contracts and its relevance to the SWW contract.
- I demonstrate how a Value Engineering (VE) study determines the least-cost method of construction and establishes the cost-effectiveness of the construction method.

Q. How is your testimony organized?

A. I treat each point referenced above in a separate section. The final section details my qualifications.

II. Background

Q. What are the important characteristics of the SWW project that affect its design and construction?

A. The unique combination of the SWW components (water temperature control, fish collection, and fish exclusion) make it a complex and one-of-a-kind structure. The important elements of the project are: (1) the mandatory performance requirements for fish passage and habitat improvement, (2) the design complexity required to accomplish those requirements, and (3) the difficulty of construction due to the remote location and extremely limited site access and work areas. In addition, the project was designed and built during a period of high inflation, especially of the price of structural steel.

A. Design Team Selection

Q. Please describe the Design Team selection?

A. In 2003 PGE sent out requests for proposals to a number of design firms requesting suggested design concepts. CH2M Hill was selected in March 2004 based on the concept of a "cheese-wheel" design for the selective water withdrawal structure. CH2M Hill started design work with that concept and a $62 million construction budget.

B. Difficulty of the Site

Q. Please describe the Round Butte construction site.

A. It is a marine construction project located in the high desert of Central Oregon. The work was performed over water and the construction period extended through winter. Due to the severely limited work area, the structures had to be erected on barges with cranes from the slightly widened east end of the dam crest and floated into position just beyond the west end of the dam.

C. Design to 25% Complete, Value Engineering Study, and Redesign

Q. Please describe the design process for the Round Butte project.

A. CH2M Hill had completed 25% of the design work by late 2004, but the estimated construction cost had increased to $73 million (plus $10 million for engineering and construction management) and serious design problems had been identified with wave, wind, and seismic loading.

PGE convened a Senior Review Board of engineers and contractors, including Ben C. Gerwick, an internationally recognized expert in marine and concrete construction, to evaluate the design, cost estimate, and risks. Mr. Gerwick and the board strongly recommended that, due to the complex nature of the design and constructability issues relating to the extremely difficult site, PGE should qualify several contractors and bring one on board to assist in the design.

Consequently, PGE decided to prepare a value engineering study, which was completed in early February 2005. The value engineering workshop addressed the design problems, developed the current SWW concept, and reduced the estimated construction cost by about $23 million.

Design resumed on the revised concept and reached the 25% design status in March 2006. Meanwhile, PGE identified potential contractors with marine construction experience and received bids in June 2006 from Barnard Construction, Traylor Brothers, and General

Construction. Barnard Construction Company was the low bidder and was selected for design support services based on both price and their approach to the project.

Barnard provided input throughout the design process and resubmitted bids at 50% design completion in February 2007. The construction contract was approved at $61.6 million, including contingencies, in March 2007. Design continued through July 2007 when the design was 95% complete. Delays were encountered between September 1, 2007 and October 25, 2007 when full notice to proceed with construction was given and the final design specifications and drawings were issued for construction.

Q. Should PGE have taken more time for the design phase? (Staff Exhibit 200, page 3)

A. No. The design took years to complete. Studies and pre-design took over 7 years (from 1997 until 2004), while design itself took over 3-½ years to complete the drawing and begin full construction in 2007. Even then, further design changes were found necessary during construction. These changes were required due to the existing site conditions and unexpected problems in achieving the desired performance criteria.

Also, inflation of construction costs was rampant during the course of design, especially for structural steel – the major material cost on the project. The Rider Levett Bucknall Quarterly Cost Reports document a 33% increase in the price of structural steel from 2004 to 2005 and a 6.25% increase from 2005 to 2006. Starting construction as soon as practical prevented further material/cost increases.

D. Difficulty of Construction

Q. Do you feel it was appropriate for PGE to involve a contractor at the 25% design stage?

A. Yes. In my opinion, this is a very difficult marine construction project that required extensive contractor input to minimize necessary cost increases and unavoidable delays. It is standard industry practice to involve a CM/GC contractor at approximately 25-30% design.

III. Types of Contracts

A. CM/GC Contracts and Negotiated vs. Fixed Price

Q. What are the most common methods of contracting for construction and their advantages?

A. The most common methods of contracting for construction are: (1) design-bid-build, (2) CM/GC, and (3) design/build. There are variations on all three methods, as well as other, less-common methods.

1. Design-bid-build requires a complete design before competitive bidding by general contractors, with the contract awarded to the low bidder at a fixed price. The advantage is more competition and knowing the total cost before initiating construction. It is best suited for projects with a clearly defined scope of work where the risks can be readily quantified by the bidders. However, it is often subject to more claims and disputes.

2. CM/GC involves selecting a contractor when the design is about 25-30% design complete, based on proposals from a number of prospective contractors and interviews to determine their qualifications and approach to the project. The method provides cost and constructability input throughout design and a guaranteed maximum price (GMP) at about the 90% design level. The owner has the option of not awarding the contract if the GMP is too high or negotiating a lower price. The advantage is contractor input that reduces the time and cost of construction, especially for complex, high-risk projects where the design depends partly upon the contractor’s approach to the work. It usually reduces the number of change orders and claims.

3. Design/Build involves selecting one firm that provides both design and construction for a fixed price, based on a preliminary design with performance criteria. The advantage is fuller integration of design and construction with the design/build contractor responsible for all risks. It can provide advantages for some types of projects where the scope and performance can be clearly defined (e.g. a parking garage). It usually results in very few claims for additional costs.

Q. How widely is CM/GC contracting used in Oregon and how successful is it?

A. CM/GC contracting has been used for decades in the private building construction industry and is the predominant method. CM/GC has been used on public building and public works projects since the mid-1970s. In 1975, while working as a construction manager at CH2M Hill, I wrote a management study that led to the first EPA-funded Agency Construction Management project. In 1990, my firm together with another company wrote the white paper that led to the adoption of CM/GC for public works projects in Washington State.

CM/GC has been widely used in Oregon, especially in the last few years. Recently I conducted a brief, informal survey of contractors and owners that revealed that the great majority of private building projects and 30% to 60% of large public building projects have been built using CM/GC. The public projects included all recent Oregon Department of Administrative Services and Oregon University System projects and most Department of Corrections projects. The Oregon Department of Transportation is using CM/GC on a large bridge project and CM/GC is used by other agencies on some large heavy-highway projects, especially by the Idaho Department of Transportation. It is also used in the utility industry.

Q. What are the advantages of CM/GC contracting over design-bid-build?

A. CM/GC allows for fast tracking design and construction, reduces contract disputes, and provides for contractor input to the design process – for cost estimating, scheduling, and constructability – which is vital for cost control.

As stated in the Oregon State University white paper (PGE Exhibit 501):

> The benefits resulting from the use of CM/GC can be greatest for projects that are high risk, possess a high level of technical complexity, are governed by significant schedule constraints, require complex phasing, contain budget limitations requiring a construction cost guarantee during design, or will realize substantial cost savings from value engineering analyses.' [pg ii]

B. Applicability of CM/GC to This Project and Adequacy of its Implementation

Q. Was the CM/GC contracting method appropriate for this project?

A. Yes. The SWW is a complex facility with a high risk of delays, cost overruns, and performance failure. In addition, it required risky, difficult construction methods and sequencing in a remote, limited site. Contractor input during the design phase was essential to ensure that the project was constructible. Failure to obtain contractor input during design would have led to higher bids, design changes, delays, claims, and further cost increases.

The project could not have been completed within the time frame agreed to by PGE, the Tribe, and all affected state and federal fisheries agencies, if PGE had used the traditional design-bid-build contracting method. Failure to meet the agreed-upon schedule would have required renegotiating the agreement and incurring further inflationary costs. Annual inflation of construction costs, especially structural steel, was approximately 10% per year. For the then-current construction budget of $60,000,000, this would have been $6,000,000, which dwarfs the cost of expediting progress.

Q. Were the procedures for selecting the CM/GC contractor appropriate?

A. Yes. Industry practice for selecting a CM/GC contractor is to invite proposals when the design is approximately 30% complete and to select the CM/GC contractor based on their qualifications, their response to the request for proposals, and their approach to the project. PGE went beyond this by requiring priced proposals which, based on the bid spread of $57 million to $74 million for construction costs, likely resulted in significant savings. Had PGE not required priced proposals, they might have ended up selecting a more expensive contractor.

Q. Did PGE select the contractor too early in the design process?

A. No. Selecting the CM/GC contractor is normally done at 30% design, PGE selected Barnard Construction at 25%, a small difference, and PGE's use of priced proposals gave a better than normal indication of which contractor was most economical.

In addition, PGE tracked the cost for each detailed line item in the contractor's initial priced proposal and required the contractor to justify any increase. This provided a greater assurance than normal practice that the contractor with the lowest price had been selected.

Q. What is a GMP and how is it used?

A. The CM/GC contractor provides a GMP based on the then-current plans and specifications plus their specified inclusions and exclusions. As the design progresses, the CM/GC provides revised costs for scope changes with substantiation of each increase. When design is complete, construction starts with the GMP as the contract amount with any changes in scope covered by a change order.

Q. Was the lack of a GMP on this project an error by PGE?

A. No. Although not described as a GMP, PGE had, in effect, the same result as they had detailed costs (an open book) for each element of the project and the CM/GC contractor had to substantiate any increase based on a change of scope. This is basically the same process used on a typical CM/GC contract.

IV. Cost Over Runs

Q. What is a cost over run?

A. Cost over-runs normally refer to situations where the actual cost of construction substantially exceeds the original contract amount as it was bid based on 100% drawings. The term isn't generally used for cost increases that occur during the design process as a result of scope changes.

Q. Staff claims that cost over runs in the SWW are a result of imprudence on PGE's part. Would you agree?

A. No. On this project, the original bid in June 2006 was based on 25% drawings and wasn't expected to provide the final price, but rather to: (1) allow PGE to select the most economical contractor to assist in completing the design, (2) give an indication of the probable final cost, and (3) provide unit prices that could be applied to the actual quantities of work. It served the purpose and allowed PGE to select the most competitive contractor and to verify that subsequent design changes were fairly priced. This was a significantly better effort than industry practice, which bases selection of the CM/GC contractor on un-priced proposals.

The increase in cost from 25% to 100% design primarily resulted from necessary scope increases required to meet the performance criteria. In addition, the percent of change would not have been unusual for this type of project, based on my experience – especially during the design phase.

V. Cost Benefit Analysis

Q. Are cost-benefit studies applicable to analysis of the design alternatives for this project?

A. No. Cost-benefit analysis measures the benefit (additional income or reduced continuing cost) of an initial or incremental cost (i.e. additional construction cost).

For this project, PGE had to meet the mandatory requirements in order to re-license the dam. The only applicable cost-benefit analysis was whether the cost of the SWW project would be worth the income from an additional 50 years of generating electricity, which is confirmed in PGE Exhibit 300, pages 23-25.

Cost-benefit analysis of design alternatives is not warranted as there are no benefits of exceeding the requirements by spending more money beyond the minimum required to meet the required performance criteria. Once the decision was made to build the project, the only cost analyses required was to determine: (1) which of many possible alternatives of the various elements of the project would achieve the required performance and then (2) which of the acceptable alternatives for each element would cost the least. Cost-benefit analysis is not applicable to this decision process, but value engineering is.

Q. What is value engineering and did it help reduce the costs of the SWW project?

A. Value engineering is a highly regarded technique for analyzing the function of each element of a project, brainstorming alternative means of performing that function, identifying the least cost alternatives, and developing details and costs of those alternatives. It is facilitated by a specialist in the technique who is also knowledgeable about construction. It also involves a multi-disciplinary team, including construction estimators, that looks at all aspects of a project and develops detailed costs for the alternatives examined, so that reasoned decisions can be made. It is widely used in the construction industry and is, in my opinion, the best available method for achieving the desired function for the least cost.

The value engineering workshop on this project provided over $20 million of savings, as noted in the Final Report. It was led by a recognized expert (who I have used on other value engineering studies) and staffed with experienced personnel from PGE, the contractors (Dix and Barnard), the designer (CH2M Hill), the National Oceanographic and Atmospheric Administration, ENSR (a fisheries engineer), and EES (a mechanical engineer). It resulted in changing from the 'cheese wheel' concept to the current design concept.

Q. Does the record show that PGE made significant good faith efforts to contain costs for this project?

A. Yes. The record clearly shows that PGE was motivated to contain costs and made well-regarded efforts to prevent cost over runs. Instead of moving forward with the 'cheese-wheel' design after the engineering estimate came in over budget, PGE conducted the value engineering study to identify the least-cost alternative and then implemented the favored solution.

In addition, PGE selected a contracting method that brought in an experienced marine contractor for design support services to evaluate means and methods, provide constructability reviews, prepare cost estimates of detailed design alternatives, recommend design changes to facilitate scheduling or reduce costs, and prepare the overall schedule.

VI. Qualifications

Q. Mr. Pinnell, please describe your qualifications.

A. My qualifications include a bachelor's degree in civil engineering from the University of Arizona and a master's degree in construction management from Stanford. Following service as a lieutenant in the U.S. Army Corps of Engineers, I worked as a project engineer and superintendent on the San Francisco Bay Area Rapid Transit project, as an estimator and project superintendent on various marine and heavy construction projects in the San Francisco Bay area and Alaska, and as a concrete and marine construction specialist on a deep water port in South America.

After returning to the U.S., I worked for CH2M Hill engineers as a civil engineering designer and resident engineer on construction at Portland International Airport and a number of utility and construction management projects in Oregon, before founding Pinnell Engineering, now Pinnell/Busch, Inc., in 1975. While at CH2M Hill, I authored a major study on construction management that led to the first EPA-funded CM project, in addition to serving as a project manager on various CM projects and as the firm-wide coordinator of scheduling and value engineering. I also published an article on the use of design/build contracting for public works projects in the American Society of Civil Engineers' monthly magazine.

As founder and president of Pinnell/Busch, Inc., I have worked on several hundred major construction projects, in addition to recommending and implementing traditional and alternative contracting methods. I have worked on numerous dam, hydroelectric, marine and steel erection projects. I authored a major industry reference book on scheduling, cost control, claims, and dispute resolution – *HOW TO GET PAID For Construction Changes* –

which was published by McGraw-Hill and includes a brief section on contracting methods. I have also authored several dozen articles in national professional and trade journals (including several on contracting methods), taught as an adjunct professor at two universities, and presented over 300 seminars and workshops throughout the United States and overseas – many of which included discussion of contracting methods.

For additional details, regarding my experience and qualifications see PGE Exhibit 502.

Q. Does this conclude your testimony?

A. Yes.

List of Exhibits

PGE Exhibit	Description
501	Oregon Public Contracting Coalition Guide to CM/GC Contracting
502	Pinnell Experience with Alternative Contract Forms and Statement of Qualifications

PGE Exhibit 501 Provided Electronically (CD) Only

Steve Pinnell's Experience with Alternative Contract Forms

The following are specific examples of articles and training based on Steve Pinnell's consulting contracts involving alternative contracting methods including Agency CM, CM/GC, Design/Build, and Turnkey Construction.

1974 Author of "Turnkey Contracts for Sewage Treatment Plants?" *Civil Engineering Magazine,* January 1974, pg 86 that questioned the use of turnkey construction contracts in the wastewater industry, while a project manager at CH2M-Hill

1975 Author of the management study *"Alternative Project Delivery Systems for the Rock Creek Advanced Wastewater Treatment Plant"* – the first EPA-funded CM project, while a project manager (and firm-wide coordinator of scheduling and value engineering) at CH2M-Hill

1975 Speaker on "Construction Management" for the Construction Surety Underwriters, after forming Pinnell Engineering

1976 Speaker on *"Scheduling"* for a one-day *"Construction Management Seminar"* sponsored by AMR International in San Francisco, California

1977 Instructor for *"Construction Management: Current Techniques & New Applications"*

1980 Author of "Construction/Engineering Management: A Comparison" the *Journal of Professional Activities,* American Society of Civil Engineers, October 1980

....

1990 *"Construction Management/Guaranteed Maximum Price Contracting"* Position Paper by Pinnell/Busch and Vanir Construction Management for the Washington Department of Corrections – April, 1990. This was used by the state legislature to initiate legislation authorizing the use of CM/GC construction contracts in the State of Washington

....

1994 *"CSO Program Management Strategy Study"* prepared for the Bureau of Environmental Services, City of Portland, Oregon. This analyzed the various methods of organization and contracting for this $1+ billion public works program that is still ongoing in 2009

....

STATEMENT OF QUALIFICATIONS

Construction Arbitrator, Mediator, Partnering Facilitator or Neutral Expert
Steven S. Pinnell

- **Design & Construction Expertise:** Construction field experience as a contractor's estimator, superintendent and project engineer. Design experience at an internationally recognized consulting engineering firm (CH2M-Hill). Knowledgeable of design standards and practices, specification writing, permits, surveying, contract administration, and inspection. Management consulting experience for local and federal public works agencies. A licensed civil engineer.

- **Broad Project Experience:** From South America, Eastern Europe, and Asia to the Caribbean. Familiar with a wide range of working conditions from the 120° Arizona desert to 40° below on Cook Inlet, Alaska. Project experience includes high-rise and mid-rise office and residential, hotels, hospitals, harbors, dredging, bridges, highways, railroad, flood control, utilities, wastewater treatment, pulp and paper, light and heavy industrial, light rail and heavy rail mass transit, electrical transmission, military facilities, and airports.

- **Seasoned Construction Manager:** Experienced with design/build, turnkey, guaranteed maximum price, CM, and other alternative project delivery methods.

- **Internationally Recognized Expert in Critical Path Scheduling:** Has scheduled over 100 major construction projects plus architectural and engineering designs, manufacturing startups, environmental studies, permits and project funding efforts. The chief proponent of the timescale arrow diagramming technique. Adjunct professor and lecturer and the author of numerous articles and professional papers on scheduling, construction productivity, cost accounting and control, value engineering, project management, and construction dispute resolution.

- **Software Developer:** The developer of PMS80, a powerful yet flexible project management software program, and author of several articles on computerization of engineering and public works management.

- **Knowledgeable in Construction Law & American Arbitration Association Rules:** He has worked with many attorneys on construction disputes, and taught university courses and numerous seminars on "Contracts, Specifications and Claims". One of the speakers for the Oregon State Bar's Continuing Education Seminar, "The Effective Use of Demonstrative Evidence".

- **An Experienced Arbitrator:** Member, American Arbitration Association, and instructor for their Basic Arbitrator Training course. Assignments ranged from a $40,000 school remodel to a $30 million three-way dispute between the owner, designer and contractor of a large, design/build hydroelectric plant and a $125 million EPC industrial contract.

- **Trained in Mediation & Partnering** by the Associated General Contractors and the American Arbitration Association.

- **Experienced Claims Consultant:** Thorough researcher with the ability to analyze large volumes of documents and prepare clearly written reports. Effective as an expert witness. Experienced in negotiation, litigation support, preparation of exhibits, and expert testimony in state and federal court, before arbitration panels, and in mediation.

- **An Unbiased Facilitator of the Construction Process:** Understands and sympathizes with the needs of all members of the industry – owners, designers, contractors, and suppliers.

- **Author of *HOW TO GET PAID For Construction Changes*,** published by McGraw-Hill, the most comprehensive reference for contractors, owners, designers, and construction attorneys on the practical aspects of creating or defending against a claim.

UE 204 / PGE / 600
Quennoz - Hager

BEFORE THE PUBLIC UTILITY COMMISSION

OF THE STATE OF OREGON

SWW Project Update

PORTLAND GENERAL ELECTRIC COMPANY

Rebuttal Testimony and Exhibits of

Stephen Quennoz
Patrick G. Hager

September 25, 2009

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I. Introduction

Q. Please state your name and position.

A. My name is Stephen Quennoz. My position at PGE is Vice President, Nuclear & Power Supply/Generation. I am responsible for all aspects of PGE's power supply generation and for decommissioning the Trojan nuclear plant. My qualifications are provided in Section VII.

My name is Patrick G. Hager. I am the Manager of the Regulatory Affairs department at PGE. I am responsible for analyzing PGE's cost of capital, including its Required Return on Equity. My qualifications were previously provided in PGE Exhibit 100.

Q. What is the purpose of your testimony?

A. The purpose of our testimony is three-fold. First, we discuss the events surrounding the April 11, 2009 structural failure of the Vertical Flow Conduit (VFC) as it was being installed. Second, we discuss the root cause analyses and insurance related to the structural failure and the change in the overall construction project and schedule. Third, we discuss the change in the SWW's revenue requirement.

Q. How is your testimony organized?

A. This introductory section is followed by six sections.

Section II describes the nature of the structural failure on April 11, 2009 and the extent of the damage to the SWW facility. To aid in understanding the structural failure, Section II begins with a description of the principal SWW components, including the VFC and the process used to connect the VFC to the other main components. Section III concerns the root cause analyses. We first discuss the results of the root cause analysis carried out by a consultant hired by PGE (Structural Integrity Associates, or SIA). We then summarize the conclusions of the other reports made available to PGE. This section also presents the steps PGE has taken to help prevent a recurrence of the failure.

Section IV discusses the claims against the contractor's insurance policies and the current status of these claims.

In Section V, we describe the efforts undertaken in early 2009 to facilitate fish passage on the Deschutes in the absence of the SWW facility. We also report the incremental costs for fish handling resulting from the construction delay.

Section VI presents updated project construction costs and revenue requirements and demonstrates that costs resulting from the delay are not part of this filing.

In the final section, we present the qualifications for Mr. Quennoz.

II. Overview of the SWW Facility and the Construction Delay

Q. Please describe the main components of the SWW facility and their functions.

A. The SWW facility consists of a tower with three structures (See PGE Exhibit 601). The Selective Withdrawal Bottom (SWB) structure sits on the bottom of the reservoir and is attached to the existing powerhouse intake. Water from the bottom of the reservoir can be drawn through the SWB.

The Vertical Flow Conduit (VFC) is a 40-foot diameter steel pipe that connects the SWB with the top Selective Withdrawal Top (SWT) structure. The VFC is the component of the SWW facility that experienced a structural failure on April 11, 2009.

The SWT structure can draw water from the top of the reservoir. The SWT also is a floating fish collection facility that includes two “V-screens”, which allow water to pass through, while screening out fish. Migrating fish are attracted to the flowing water, and are separated and directed to a fish collection facility for biological studies and transport downstream.

Q. Please describe the VFC assembly procedure.

A. Due to its large size (40 ft. diameter pipe about 150 ft. long), the VFC was assembled from ten cylindrical segments that were bolted together at flange joints. The segments were numbered 1 through 10, with 10 as the top segment. A bearing ring and tension ring were connected to the bottom of segment 1. The tension ring at the bottom of the VFC sits on top of the SWB.

The VFC segment flanges were assembled in the reservoir, using a pontoon barge. The first segment (including the bearing ring and tension ring) were assembled and partially lowered into the water. Segment 2 was then moved to the barge and bolted to segment 1.

The process of lowering the VFC in the water and bolting on successive segments continued until all ten segments were in place. Buoyancy tanks were attached to segments 6 and 8.

Q. What was the procedure to connect the SWB, VFC, and SWT together?

A. The SWB, VFC, and SWT were constructed separately. The procedure for connecting the three components together was to first connect the VFC to the SWT and then connect the SWT/VFC to the SWB. At the time of the failure, the VFC was suspended 50 ft. below the surface of the reservoir so that the SWT could be moved over and connected to the top of the VFC. Flotation devices (buoyancy tanks and temporary buoyancy bags) on the upper half of the VFC were used to suspend the VFC, while tether ropes anchored the VFC to the bottom of the reservoir.

Q. What transpired during the effort to connect the SWT and the VFC on April 11, 2009?

A. On the evening of April 11, the VFC was suspended below the surface of the reservoir and the SWT was being moved into position to connect with the VFC. At approximately 10:05 PM, the top portion (segments 6 through 10) of the VFC breached the surface when the SWT was approximately 15 feet from the VFC location. The bottom half of the VFC (segments 1 through 5) fell to the bottom of the reservoir and broke into three pieces. The final resting state of the VFC after the structural failure is shown in Figure 2 of the SIA report (Confidential Attachment A of PGE Exhibit 602).

Q. Why did the top half of the VFC surface?

A. The bolted joint between segments 5 and 6 failed. The three nylon ropes that tethered the VFC to the bottom of the reservoir broke, allowing the flotation devices attached to segments 6-8 to bring the upper half of the VFC to the surface. The top half of the VFC was secured by workers at the site at approximately 1:00 AM on April 12.

Q. What was the structural damage to the SWW facility?

A. After inspection, we concluded that the top half of the VFC was not damaged. We also determined that the tension ring at the bottom of the VFC sustained minor damage but was repairable. The bottom five segments of the VFC were damaged; three segments were repairable and two had to be re-fabricated.

Q. Has PGE taken steps to ensure that the attachment of the VFC to the SWT and the SWB will be successful in the future?

A. Yes. PGE hired SIA to help determine the cause of the failure. In addition, where possible, PGE has acquired, or will acquire, the root cause analyses or reports produced by consultants for other parties involved (i.e., the subcontractor who assembled the VFC [Dix], the main contractor [Barnard], and Barnard's insurance companies Lexington Insurance Company [Lexington] and Princeton Excess & Surplus Insurance Company [Princeton]). As a result, PGE has implemented improvements in both design and procedures. These changes are discussed in detail in Section III. The reports available were provided in PGE's Response to OPUC Data Request No. 59 (Confidential Attachments A-C of PGE Exhibit 602).

Q. Does the SWW facility have a new projected on-line date?

A. Yes. The facility is expected to be on-line in December or early January 2010, depending on weather and construction. By this date, both construction and final hydrological testing will have been completed. With the completion of the hydrological testing, the SWW facility will be fully on-line, facilitating both water temperature control and fish passage.

III. Root Cause Analysis

Q. Has PGE performed or commissioned a root cause analysis regarding the April 11 SWW incident?

A. Yes. PGE commissioned Structural Integrity Associates (SIA) to determine "why the VFC separated while awaiting final installation and what PGE needs to do to prevent a similar failure from happening again."[1] SIA's report was supplied to parties in PGE's Response to Data Request No. 59. (Confidential PGE Exhibit 602).

Q. What aspects of the VFC design and procedures did SIA evaluate to determine the underlying causes of the structural failure?

A. SIA evaluated four aspects of the VFC:

- VFC flange design;
- VFC flange construction methods;
- Fastener metallurgical properties; and
- The tethering and buoyancy process.

Q. What did SIA conclude about the causes of the structural failure?

A. Based on their analysis, Structural Integrity Associates identified the five following causes. Causes judged to be more significant to the event were listed first:

[redacted]

[redacted]

[1] Structural Integrity Associates, Inc., *Physical / Mechanistic Cause of VFC Failure (Task 6)*, p 20.

[redacted]

[redacted]

[redacted]

Q. Does PGE agree with these five factors?

A. For the most part, yes.

Q. Did other participants in the construction/design process for the SWW facility commission root cause analyses?

A. Yes. As discussed above, PGE is aware of two other root cause analyses and one "opinion of root cause of failure". The insurance firms Lexington and Princeton commissioned a root cause analysis from Crawford Technical Services (Crawford) who in turn contracted with Engineering Design & Testing Corporation (ED&T). Barnard has commissioned Wiss, Janney, Elstner Associates, Inc. to perform a root cause analysis. An "opinion of root cause of failure" was provided to Dix Construction by Coffman Engineers (Coffman).

Q. Did PGE request copies of these root cause analyses?

A. Yes. PGE was able to obtain the reports by Coffman and ED&T. Barnard has agreed to provide PGE a confidential copy of their report; however, PGE has not yet received Barnard's report.

Q. Has PGE provided copies of the root cause analyses to parties?

A. Yes. As described above, in PGE's Response to OPUC Data Request No. 059, dated September 9, 2009, PGE has provided copies of the reports by SIA, ED&T and Coffman.

Q. Will the Barnard report offer any recommendations?

A. Yes. Barnard will provide a full list of recommendations and actions to be taken to address each recommendation prior to VFC installation.

Q. What did ED&T conclude in their report?

A. The ED&T report[2] concluded that:

[redacted]

Q. Does PGE agree with ED&T's conclusions?

A. No, since multiple causes were involved. The SIA report provides a more complete and thorough evaluation of the event.

Q. What did the Coffman "Opinion of Root Cause Analysis" conclude?

A. [redacted]

[2] Engineering Design & Testing Corp., *PRELIMINARY REPORT Concrete Dam – VFC Failure*, p 24.

[redacted]

Q. Does PGE agree with the Coffman conclusions?

A. No, since multiple causes were involved. The SIA report provides a more complete and thorough evaluation of the event.

Q. What did SIA recommend as corrective actions to prevent a recurrence of the structural failure?

A. SIA provided detailed recommendations listed below for corrective actions [redacted]

[redacted]

Q. Has PGE implemented these recommendations?

A. PGE is in the process of implementing these recommendations. PGE, the project engineer (CH2M Hill), and the construction contractors are collaboratively developing a revised work plan that incorporates SIA's principal recommendations and incorporates other changes as

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[3] Coffman Engineers, *Opinion of Root Cause of Failure*, p 1.
[4] Structural Integrity Associates, Inc., *Physical / Mechanistic Cause of VFC Failure (Task 6)*, pp. 54-57.

developed during the review of the event and alternative methodologies. The current draft work plan is expected to be completed shortly.

Q. Has PGE made other modifications to its work plan for the SWW facility?

A. Yes. The revised work plan will require a new process to hold the VFC at the correct elevation while it is connected to the SWT. The new procedure dispenses with the nylon tethers that failed on the first attempt to connect the VFC and SWT.

IV. Insurance

Q. Typically, contractors procure Builders' Risk insurance for a project during the course of its construction in order to cover some or all of the construction cost due to damage or loss like the April 11 structural failure. Do any of the parties to the construction have such insurance?

A. Yes. Barnard Construction had, prior to the commencement of work at the project, procured Builders' Risk coverage

Q. Does PGE expect to receive any funds from these insurance companies to cover the repairs to the VFC?

A. The Builders' Risk insurers that provided coverage to Barnard Construction and PGE have denied coverage based on certain policy exclusions. It is uncertain at this time whether or not insurance proceeds will be recovered for the loss.

Q. Can you describe the insurance policies purchased by Barnard to cover construction risks at the SWW facility site?

A. Prior to the commencement of work at the SWW facility, Barnard procured Builders' Risk (Course of Construction) coverage covering all risks of direct physical loss or damage to the project occurring during the construction phase. The coverage is for the full replacement cost and underwritten on a 50% quota share basis shared between Lexington (a member company of AIG) and Princeton (Munich Re America). The coverage is subject to a $250,000 per occurrence deductible. As the project owner, and per the insurance coverage language, PGE is included as an insured under the policies.

Q. Have the insurance companies agreed to pay any of the costs related to the April 11 incident?

A. Yes. The two Builders' Risk insurers, Lexington and Princeton, have paid a portion of the salvage costs, but they have denied the bulk of Barnard's claim. Lexington and Princeton claim that there is no coverage under the Builder's Risk Policy for Barnard's VFC claim because the VFC failure was a result of faulty workmanship and faulty design, which is not covered under the policy. Barnard disagrees and has filed suit in the State of Montana against the two insurance companies to recover its losses.

Q. Who will cover the costs that are not being borne by the insurance companies?

A. PGE believes that the construction companies and/or the design company bear responsibility for the VFC failure and that they or their Builders' Risk insurance companies are contractually obligated to pay for all of the construction cost to complete the project. Nevertheless, the ultimate disposition of the costs is uncertain and will not be known in the short-term. It will take some time for the legal process to resolve the claims. In this docket, PGE is seeking recovery only of the SWW construction costs had the April 11 incident not occurred, plus AFDC.

Q. Has PGE taken any steps to ensure that the SWW project is completed in a timely and cost effective manner?

A. Yes. PGE has encouraged parties to continue work on the SWW, including a redesign of some components and repairing or re-fabricating necessary parts. In addition, PGE has provided temporary financing to Barnard to facilitate timely completion.

V. Incremental Costs for Fish Passage

Q. What is the history and current status of fish passage mitigation efforts for Pelton/Round Butte?

A. When the Round Butte dam was constructed in 1964, a fish passage system (both upstream and downstream) was also constructed to facilitate fish migration. However, after a few years, it became apparent that a combination of river currents and water temperatures prevented fish from finding their way through the reservoir to the downstream passageway. In response, PGE built a hatchery on the Round Butte powerhouse deck to support the fishery.

In the summer of 2005, a new 50-year license was issued through the Federal Energy Regulatory Commission (FERC). As part of the new FERC license for the Pelton/Round Butte Hydroelectric Project, PGE and the Tribes committed to reestablishing the anadromous fish runs above Round Butte Dam. The SWW facility is designed to meet the FERC requirement by improving reservoir currents and hence directing downstream migrating fish into the collection facility.

Q. How many fish species are affected by the SWW facility?

A. Four species are primarily affected by the SWW: Sockeye and Spring Chinook salmon, steelhead trout and bull trout. Spring Chinook and steelhead have been reintroduced to the rivers above the dam; steelhead in 2007 and Spring Chinook in 2008. Sockeye salmon have been able to live and spawn in the lake behind the dam, but the fish passage facility will restore their anadromous life cycle. The facility will also allow the reconnection of bull trout populations.

Q. What has PGE done to facilitate fish passage during the delay in the SWW facility's construction schedule?

A. PGE determined that trapping smolts (juvenile fish migrating downstream to the ocean) in the tributaries to Lake Billy Chinook, and transporting them past the dams was the best course of action. Between April and June, PGE staff trapped salmon and steelhead smolts in the Metolius, Crooked, and upper Deschutes rivers. The smolts were then transported and released into the lower Deschutes River below the final dam at Pelton/Round Butte. Twelve full-time and temporary employees were assigned to trap, transport, and release the smolts.

Q. How much did this effort cost?

A. PGE tracked the costs associated with the spring fish passage effort. Total costs were approximately $14,000; which is labor for a period of approximately 750 hours. These costs are not included in our request in this docket.

VI. Updated Revenue Requirement

Q. What is the updated SWW overall impact on PGE's revenue requirement?

A. PGE currently forecasts that the SWW's revenue requirement will be $12.4 million. PGE Exhibit 603 summarizes the updated SWW incremental revenue requirement. A spreadsheet with updated actual transactions for the SWW through August 2009 and the support for the revenue requirement calculation are provided in our work papers.

Q. What are the changes to revenue requirement?

A. The overall construction and engineering portion budget has not changed. Additional AFDC costs have been incurred as a result of the construction delay. Table 1 below summarizes the differences between PGE's last updated revenue requirement in PGE's Response to OPUC Data Request No. 055, and our updated request.

Table 1
Summary of Capital Cost Estimates ($000s)

	PGE's Response to OPUC Data Request No. 55	Update	Difference
Construction & Engineering	106,904	106,904	0
PGE Loading	807	1,314	507 [5]
Total Cost	107,711	108,218	507
PGE Share (66.67%)	71,811	72,148	337
PGE Property Taxes	364	364	0
PGE AFDC	6,001	9,197	3,195
PGE Total	78,346	81,710	3,533

Q. What are the actual capital costs through August of the SWW project?

A. Total capital costs (100% share) through August 2009 are $101 million, excluding AFDC and capitalized property taxes.

[5] Construction overhead costs of $0.5 million (100% share) were excluded from PGE's Response to OPUC Data Request No. 55. These costs relate to 2005, 2006, and 2007, and would have been incorporated in actual costs, irrespective of the April 11, 2009 incident. Support for this figure is provided in the revenue requirement work papers.

Q. Is the Barnard incentive payment still included in the total $106.9 million of construction costs?

A. Yes. We have left it in the total costs because the issue of payment has not been formally resolved. However, at this time we do not anticipate paying this fee and, once this is confirmed, the incentive payment will be removed for rate setting purposes.

Q. Is PGE asking customers to pay for any portion of the additional O&M costs resulting from the repairs?

A. No. Consistent with the October 9, 2008 stipulation in UE 197 between PGE, OPUC Staff and other intervenors, PGE is filing for only the fixed (capital) portion of the SWW.

Q. What effect has the SWW construction delay had on PGE's revenue requirement?

A. The only material change in PGE's revenue requirement resulting from the SWW construction delay is the additional AFDC. The change in AFDC is reported in Table 1.

Q. Why should customers' rates reflect the additional accrued AFDC resulting from the delay?

A. The additional accrued AFDC represents return on investor capital that is not yet in rate base. Relative to the original in-service date, the inclusion of this additional AFDC does not result in a material change in the present value of revenue requirements. Customers accrue additional AFDC, but the revenue requirement "payments" are pushed back during the delay. The effect is analogous to missing a number of mortgage payments and then later having to make up the interest; the present value of the mortgage payments does not change. The effect of the additional AFDC on the present value of revenue requirements is shown in Table 2 below. The backup behind this table is included in our work papers.

Table 2
Comparison of Lifecycle Models ($000s)

	July 1, 2009 Close	Jan 1, 2010 Close	Difference
PGE's Capital Cost	$ 78,515	81,710	3,195
Present Value	97,295	97,617	322

Q. Are PGE's customers harmed by the delay and additional AFDC?

A. No. Because of the delay, the prices PGE's customers pay have not yet been increased to recover the revenue requirements of the SWW. On a NPV basis, customers are financially indifferent to the delay (as demonstrated in Table 2). In other words, the additional revenue requirement of the AFDC is offset by the present value savings that have occurred because of the delay.

VII. Qualifications

Q. Mr. Quennoz, please describe your qualifications.

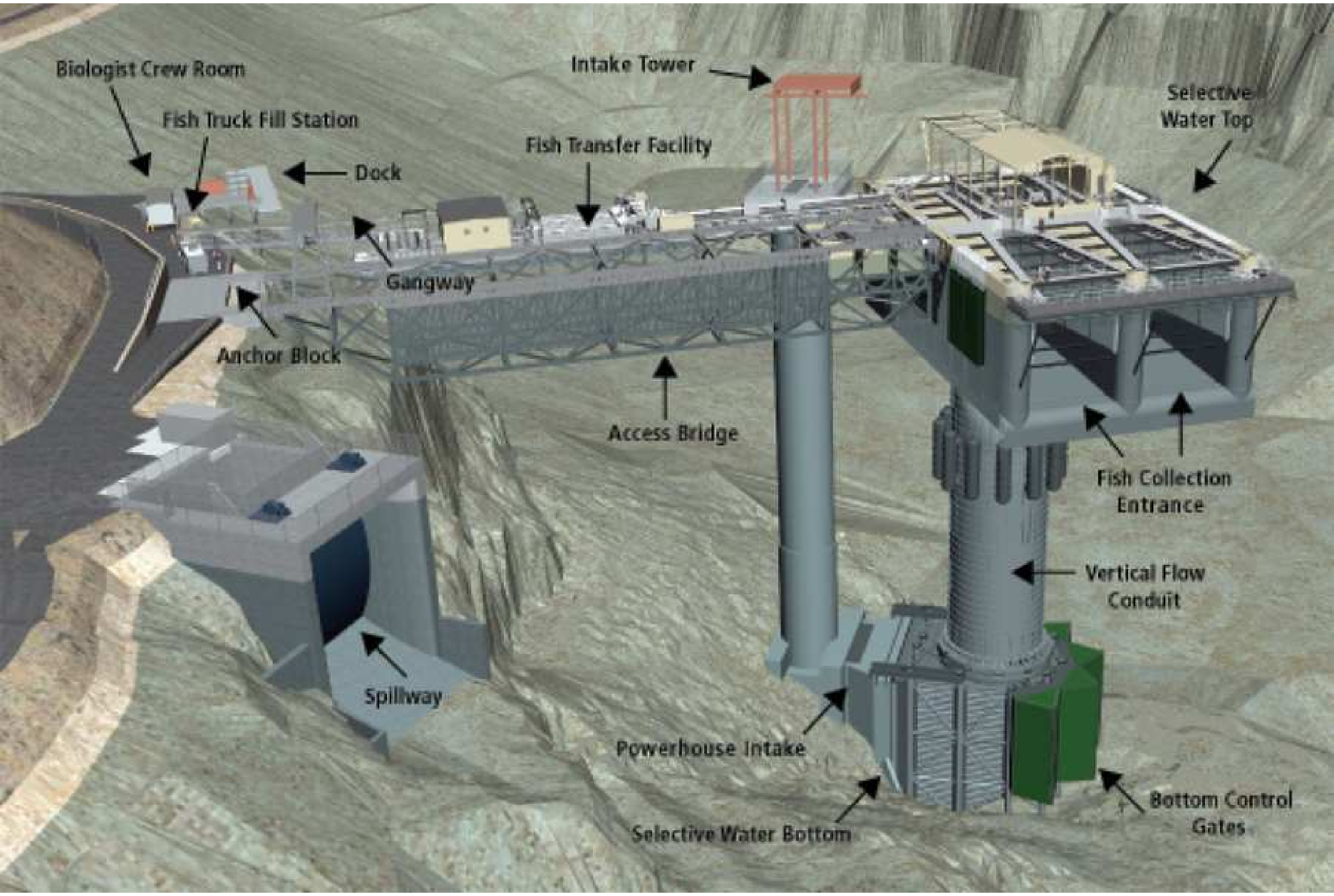
A. I hold a Bachelor of Science degree in Applied Science from the U.S. Naval Academy and hold Masters degrees in Operations Analysis from the University of Arkansas, Mechanical Engineering from the University of Connecticut, Nuclear Engineering from North Carolina State University, and an MBA from the University of Toledo. Prior to working for PGE, I held positions as Plant Superintendent at the Davis-Besse Nuclear Station for Toledo Edison and General Manager at the Arkansas Nuclear One Station for Arkansas Power and Light. I also coordinated restart of the Turkey Point Nuclear Station for Florida Power and Light. I joined PGE in 1991 and served as Trojan Plant General Manager and Site Executive. I assumed responsibilities for thermal operations in 1994 and hydro operations in 2000. I was appointed Vice president, Nuclear and Thermal Operations in 1998, and Vice president Generation in 2000. I've held my current position of Vice President, Nuclear and Power Supply since August 2004. My responsibilities include overseeing all aspects of PGE's power supply, as well as the decommissioning of the Trojan nuclear plant. I am a registered Professional Engineer (P.E.) in the State of Ohio.

Q. Does this conclude your testimony?

A. Yes.

List of Exhibits

PGE Exhibit	Description
601	SWW Components
602	PGE's Response to OPUC Data Request No. 59
603	Summary of Updated SWW Incremental Revenue Requirement


Biologist Crew Room
Fish Truck Fill Station
Dock
Intake Tower
Fish Transfer Facility
Selective Water Top
Gangway
Anchor Block
Access Bridge
Fish Collection Entrance
Vertical Flow Conduit
Spillway
Powerhouse Intake
Selective Water Bottom
Bottom Control Gates

September 9, 2009

TO: Vikie Bailey-Goggins
Oregon Public Utility Commission

FROM: Randy Dahlgren
Director, Regulatory Policy & Affairs

PORTLAND GENERAL ELECTRIC
UE 204
PGE Response to OPUC Data Request
Dated August 27, 2009
Question No. 059

Request:

During a meeting between parties to discuss scheduling on June 25, 2009 PGE indicated that it was aware of three separate root-cause analyses being performed on the SWW incident, which occurred on April 11, 2009, that would be completed by "late July or early August." Additionally, at the prehearing conference on July 29, PGE stated that it would "give parties all of the investigation materials in its possession and agreed to make an effort to obtain the two root-cause analyses identified by CUB." Please provide a copy of the three root-cause analyses referenced at the June 25th meeting and at the pre-hearing conference on July 29th.

Response:

Two root cause analyses (RCA) and one "opinion of root cause of failure" are attached to this response.

An RCA was performed for PGE by Structural Integrity Associates (SIA). SIA submitted one overall report (the Task 6 report) and four supporting reports (the Tasks 1 through 4 reports). The Task 6 report summarizes the analysis and conclusions of the SIA RCA. The Task 1 report is an evaluation of the Vertical Flow Conduit flange design and bolt selection. The Task 2 report is an evaluation of the methods used to install the fasteners for the flange construction. The Task 3 report is an evaluation of the metallurgical properties for the materials from which the fasteners were manufactured. The Task 4 report is an evaluation of the VFC tethering and buoyancy process. These 5 reports are included in Attachment 059-A. Note: There is no Task 5 report. SIA made a proposal to provide legal support relating to the VFC failure, but PGE did not commission this work. This work would have been Task 5.

Attachment 059-B is the "opinion of root cause of failure" that was performed for Dix construction by Coffman Engineers, and was later provided to PGE.

Attachment 059-C is a “Preliminary” RCA performed for Lexington Insurance Company and Princeton Excess and Surplus Lines Insurance Company by Engineering Design & Testing Corporation, and was later was provided to PGE. A third RCA is being prepared for Barnard Construction by a consulting company (Wiss, Janney, Elstner Associates, Inc.). PGE is taking steps to obtain this report and hopes to obtain a copy at the end of September (approximately).

Attachments 059-A, 059-B and 059-C are confidential and subject to Protective Order No. 08-515.

UE 204
Attachment 059-A

Confidential and Subject to Protective Order No. 08-515

Provided Electronically (CD) Only

Structural Integrity Associates

UE 204
Attachment 059-B

Confidential and Subject to Protective Order No. 08-515

Provided Electronically (CD) Only

Coffman Engineers

UE 204
Attachment 059-C

Confidential and Subject to Protective Order No. 08-515

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Engineering Design & Testing Corporation

PGE Exhibit 603 Provided Electronically (CD) Only