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June 20, 2012

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OREGON PUBLIC UTILITY COMMISSION
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**RE: Docket No. UE 246 – In the Matter of PACIFICORP, dba PACIFIC
POWER Request for a General Rate Revision.**

Enclosed for electronic filing in the above-captioned docket is the Public
Utility Commission Staff's Opening Testimony, Exhibit 400, on Coal Plant
Investment Prudency.

/s/ Kay Barnes

Kay Barnes

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Filing on Behalf of Public Utility Commission Staff

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c: UE 246 Service List (parties)

CERTIFICATE OF SERVICE

UE 246

I certify that I have, this day, served the foregoing document upon all parties of record in this proceeding by delivering a copy in person or by mailing a copy properly addressed with first class postage prepaid, or by electronic mail pursuant to OAR 860-001-0180, to the following parties or attorneys of parties.

Dated this 20th day of June, 2012 at Salem, Oregon

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**PUBLIC UTILITY COMMISSION
OF OREGON**

UE 246

Staff Opening Testimony

Of

Erik Colville

Re: Coal Plant Investment Prudency

**In the Matter of
PACIFICORP, dba PACIFIC POWER
Request for a General Rate Revision.**

June 20, 2012

CASE: UE 246
WITNESS: Erik Colville

**PUBLIC UTILITY COMMISSION
OF
OREGON**

STAFF EXHIBIT 400

Opening Testimony

June 20, 2012

Q. PLEASE STATE YOUR NAME, OCCUPATION, AND BUSINESS ADDRESS.

A. My name is Erik Colville. I am a Senior Utility Analyst for the Public Utility Commission of Oregon. My business address is 550 Capitol Street NE, Suite 215, Salem, Oregon 97301-2551.

Q. PLEASE DESCRIBE YOUR EDUCATIONAL BACKGROUND AND WORK EXPERIENCE.

A. My Witness Qualification Statement is found in Staff/401.

Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY?

A. As the Commission's witness related to prudence of coal plant investments my testimony provides a discussion explaining the Public Utility Commission of Oregon Staff's determination that PacifiCorp's environmental compliance investment actions were prudent. Those actions being environmental compliance investments made in the Naughton Units 1 and 2, Dave Johnston Unit 4, Hunter Units 1 and 2, Wyodak, and Jim Bridger Unit 3 coal fired plants for reduction of sulfur dioxide (SO₂), nitrogen oxides (NO_x), and particulate matter (PM) emissions. Because I have identified some infirmities in PacifiCorp's decision-making process, I also provide testimony recommending that the Commission clarify its expectations regarding utilities' analyses prior to environmental compliance investments at coal plants.

Q. DID YOU PREPARE EXHIBITS FOR THIS DOCKET?

A. Yes. I prepared Staff/402 consisting of two pages, Staff/403 consisting of seven pages, and Staff/404 consisting of one page.

1 **Q. PLEASE SUMMARIZE YOUR CONCLUSION.**

2 A. Prudence is determined by the reasonableness of the actions based on
3 information that was available (or could reasonably have been available) at the
4 time. I examined the reasonableness of PacifiCorp's actions in making the
5 environmental compliance investments in the Naughton Units 1 and 2, Dave
6 Johnston Unit 4, Hunter Units 1 and 2, Wyodak, and Jim Bridger Unit 3 coal
7 fired plants, and conclude the actions were prudent. Even though PacifiCorp's
8 actions were reasonable, I conclude that the Company's decision process had
9 some infirmities. To help ensure an improved process going forward, I
10 recommend that the Commission clarify in this docket its expectations
11 regarding analyses prior to environmental compliance investments at coal
12 plants.

13 **Q. HOW DOES THE COMMISSION DETERMINE PRUDENCE?**

14 A. "Prudence is determined by the reasonableness of the actions 'based on
15 information that was available (or could reasonably have been available) at the
16 time.'" (*In re PGE*, UE 102, Order No. 99-033 at 36-37.)¹

17 **Q. IS IT POSSIBLE TO CONCLUDE THAT THE ENVIRONMENTAL**
18 **COMPLIANCE INVESTMENTS WERE PRUDENT NOTWITHSTANDING**
19 **THE DECISION INFIRMITIES?**

20 A. Yes. Prudence is determined by the reasonableness of the actions based on
21 information that was available (or could reasonably have been available) at the

¹ See also *In re Northwest Natural Gas*, UG 132, Order No. 99-697 at 52("In this review, therefore, we must determine whether the NW Natural's actions and decisions, based on what it knew or should have known at the time, were prudent in light of existing circumstances.").

1 time. The Commission has clarified that “if the record demonstrates that a
2 challenged business decision was reasonable, taking into account established
3 historical facts and circumstances, the utility’s decision must be upheld as
4 prudent even if the record lacks detail on the utility’s actual subjective decision
5 making process.” (See Order No. 02-469 p. 5; *In re PacifiCorp* (Commission
6 adopting PacifiCorp’s description of the legal standard for determining
7 prudence.)) Under this standard, a utility’s action can be prudent even if the
8 process leading up to the decision has infirmities. A utility’s decision process is
9 probative on whether the action itself is prudent, but under the Commission’s
10 prudence standard, the primary focus of the inquiry is on the objective
11 reasonableness of the action, not on the process leading to it.

12 **Q. WHAT WERE THE COMPANY’S ACTIONS?**

13 A. PacifiCorp’s actions were to make 12 distinct environmental compliance
14 investments in the Naughton Units 1 and 2, Dave Johnston Unit 4, Hunter Units
15 1 and 2, Wyodak, and Jim Bridger Unit 3 coal fired plants. The investments
16 are listed on Staff/402, and included projects to reduce emissions of SO₂,
17 NO_x, and PM. In total, the investment amounted to approximately \$600
18 million.

19 **Q. WERE PACIFICORP’S DECISIONS TO INVEST IN THESE**
20 **ENVIRONMENTAL COMPLIANCE PROJECTS REASONABLE GIVEN**
21 **WHAT THE COMPANY KNEW, OR SHOULD HAVE KNOWN?**

22 A. Yes. The Company’s decisions to proceed with the environmental compliance
23 investments in the Naughton Units 1 and 2, Dave Johnston Unit 4, Hunter Units

1 1 and 2, Wyodak, and Jim Bridger Unit 3 coal fired plants were reasonable. In
2 accordance with the prudence standard, since the actions were reasonable,
3 those actions were prudent.

4 **Q. WHAT IS THE BASIS FOR YOUR CONCLUSION?**

5 A. PacifiCorp's testimony labeled PAC/500 Teply presents the process the
6 Company followed and the analyses it performed to inform its business
7 decisions to proceed with the environmental compliance investments
8 discussed above. The technical and economic analyses prepared by and for
9 PacifiCorp showed the environmental compliance investments were in the best
10 interest of customers. While the PacifiCorp economic analyses showed all the
11 environmental compliance investments were in the best interest of customers,
12 the analysis for the Naughton Units 1 and 2 showed that the result of positive
13 net benefits was sensitive to economic factors including variations in the
14 market price of electricity, natural gas fuel cost, and potential carbon dioxide
15 (CO2) emission costs. I mention the sensitivity of the economic analyses
16 results for Naughton Units 1 and 2 not to question the reasonableness of those
17 investment decisions but instead to draw attention to the process the Company
18 followed to inform its business decision making.

19 **Q. DID THE COMPANY REASONABLY IMPLEMENT ITS BUSINESS**
20 **DECISIONS TO PROCEED WITH THE ENVIRONMENTAL COMPLIANCE**
21 **INVESTMENTS?**

22 A. Yes. PacifiCorp initiated competitive bidding processes for various long lead
23 time major components as well as engineering, procurement, and construction

1 (EPC) services. PacifiCorp executed these contracts during the January 2008
2 to May 2011 time period, depending on the project. PacifiCorp's effort to
3 balance cost/risk in its implementation of the environmental compliance
4 investments was primarily through lump-sum, turnkey, EPC contracts, with
5 performance guarantees, resulting from competitive bidding processes.

6
7 PacifiCorp management provided oversight of the project and closely
8 managed any project execution plan changes or potential contract scope
9 changes.

10
11 PacifiCorp states that these investments will allow ongoing energy production
12 from the retrofitted facilities through their depreciable life as the least-cost
13 outcome, accounting for risk and uncertainty, for customers (PAC/500 Teply/4).

14
15 I conclude this was a commonly used approach to implement capital projects,
16 and was reasonable.

17 **Q. WHAT PROCESS WOULD A COMPANY USE TO INFORM A**
18 **REASONABLE BUSINESS DECISION?**

19 A. In the case of an environmental compliance investment, a company would:
20 identify all currently known regulatory requirements; identify as best possible
21 what regulatory requirements may be enacted in the future; identify and
22 evaluate alternatives for compliance; identify alternatives to compliance;
23 perform life-cycle economic analyses, including sensitivity cases; make a

1 decision based on the aforementioned information; re-evaluate the decision as
2 significant milestones are reached; balance cost/risk in implementation
3 method; and actively manage implementation to assure budget, schedule and
4 performance compliance.

5 **Q. HOW DID YOU EVALUATE THE COMPANY'S DECISION MAKING**
6 **PROCESS?**

7 A. I examined the following four areas, and the flow of the decision making
8 process as follows: Step 1 – what the Company knew, or should have known,
9 at the time of decision making; Step 2 - what the company did to evaluate what
10 it knew; Step 3 - what process the company used to make a decision; and Step
11 4 - how the company managed implementation of its decision. After completion
12 of these steps, I examined the reasonableness of the Company's process by
13 comparison to the process I set forth above that would lead to a reasonable
14 decision.

15 **Q. WHAT DID YOU IDENTIFY IN THESE STEPS?**

16 A. In each of the four steps I identified the following:

17 Step 1 (information the Company knew or should have known) - at the time the
18 decisions were made to proceed with the environmental compliance
19 investments, PacifiCorp knew with certainty that it was required to comply with
20 existing regulations including: Regional Haze Rules related to NOx and PM,
21 National Ambient Air Quality Standards, the Regional SO2 Milestone and
22 Backstop Trading Program developed in alignment with existing federal
23 regulations and administered in Utah and Wyoming, state-issued construction

1 and operating permits, and state implementation plans. Also, the Company
2 should have known it would be required to meet the expected requirements of
3 upcoming environmental regulations, such as Regional Haze Best Available
4 Retrofit Technology (RH BART), and the Mercury and Air Toxics Standards
5 (MATS) Acid Gas requirements. Further, the Company should have known of
6 an Environmental Protection Agency (EPA) proposed rule for coal combustion
7 residuals (CCR), and initial work on an effluent guideline rule and a cooling
8 water intake rule (316b). Lastly, the Company should have known of the future
9 possibility for some form of CO2 emission regulation. As shown on Staff/403,
10 the dates decisions were made (shown as NTP, or notice to proceed) range
11 from January 2008 to May 2011, depending on the environmental compliance
12 project. Staff/403 also shows these NTP dates overlaid on the regulatory
13 timeline to depict what the Company knew or should have known at the time its
14 decisions were made.

15
16 Step 2 (evaluation of knowledge) – to evaluate what it knew, PacifiCorp
17 considered its 2002 Multi-Pollutant Control Report and 2005 NOx Emission
18 Reduction Technologies Study. The Company also considered its 2007 BART
19 Analyses performed for all but the Hunter Units 1 and 2. Staff/404 provides a
20 listing of the seven technical analyses PacifiCorp had performed. The BART
21 analyses were performed in compliance with Regional Haze regulations and

1 guidelines.² At the time the Company made its decisions to proceed with the
2 Hunter Units 1 and 2 environmental control projects, PacifiCorp was required
3 by a Utah state permit to perform specific pollution control equipment projects
4 which Utah deemed met presumptive BART limits.³ As such, no specific
5 BART analyses were performed.⁴ Lastly, through its present value revenue
6 requirement differential (PVRR(d)) analyses, the Company evaluated on a coal
7 plant unit-by-unit basis the benefits, or costs, associated with its environmental
8 compliance investments compared with early retirement (PAC/500 Teply/21).
9 These PVRR(d) analyses included estimates for environmental compliance
10 investment capital costs through 2026 related to all but the potential CCR,
11 effluent limit, and 316b requirements identified in Step 1 above.⁵ These
12 PVRR(d) analyses showed a benefit to customers for making all the known
13 environmental compliance investments and continuing to operate each coal
14 plant unit. There were no sensitivity cases performed in the PVRR(d) analyses
15 for variation in fuel or electricity cost, or for CO2 regulatory cost.

16
17 PVRR(d) analyses updates since the time the decisions were made have been
18 included in the Company's annual business planning and integrated resource
19 planning (IRP), and include proxy costs for CCR and 316b requirements
20 (PAC/500 Teply/16-19). Beginning with PacifiCorp's 2011 IRP, and evolving

² Typical of statement on page 3-1 of BART Analysis for Dave Johnston Units 3 Through 4, February 2007, CH2M Hill.

³ Utah Approval Order Number DAQE-AN0102370012-08.

⁴ Pages 20-27 of Utah State Implementation Plan Section XX Regional Haze, April 6, 2011.

⁵ Based on the Company's confidential response to Staff Data Request 138 1st Supplement.

1 further in its IRP Supplement, the effect of possible CO2 regulatory cost, as
2 well as variation in fuel and electricity price, have been included in the
3 PVRR(d) analyses (PAC/500 Teply/93-98). The PVRR(d) updates continue to
4 show benefit to customers for making all the known environmental compliance
5 investments and continuing to operate each coal plant unit.⁶

6
7 Step 3 (Company decision-making process) – the process used by the
8 Company to make its decisions was to: evaluate the current regulatory
9 requirements; factor in existing operating requirements, fuel supply flexibility,
10 equipment end of life/performance considerations, and operational efficiencies;
11 factor in emerging environmental regulations (PAC/500 Teply/23), absent
12 possible CO2 emission regulation; conduct thorough analyses, absent
13 sensitivity cases for fuel cost, electricity cost and CO2 regulatory cost; and
14 evaluate and follow the analyses recommendations.⁷

15
16 Step 4 (Company implementation of decisions) – the Company managed
17 implementation of its decisions typically through lump-sum, turnkey, EPC
18 contracts, with performance guarantees, resulting from competitive bidding
19 processes (PAC/500 Teply/11). The exception is for low NOx burner projects,
20 for which the Company also allowed service level agreement rate structures.
21 PacifiCorp management provided oversight of the projects and closely

⁶ Typical of statement at PAC/500, Teply/39.

⁷ Largely presented at PAC/500, Teply/20-21.

1 managed any project execution plan changes or potential contract scope
2 changes.

3 **Q. HOW DOES PACIFICORP'S DECISION MAKING PROCESS COMPARE**
4 **WITH THE PROCESS A COMPANY WOULD FOLLOW TO INFORM A**
5 **REASONABLE DECISION?**

6 A. I describe below my evaluation of how PacifiCorp's decision making process
7 compares with the process I set forth above that a company would follow to
8 inform a reasonable decision.

9
10 *Identify All Currently Known Regulatory Requirements and Identify As Best*
11 *Possible What Future Regulatory Requirements May Exist*

12 After review of PAC/500 Teply, and the suite of environmental regulatory
13 requirements depicted on Staff/403, I conclude PacifiCorp was aware of all the
14 environmental regulatory requirements it reasonably should have been. I also
15 conclude that PacifiCorp identified and considered, as best possible, what
16 future environmental regulatory requirements were likely, with the exception of
17 the future possibility for CO2 emission regulation. I conclude PacifiCorp's
18 decision making was reasonable overall, but did not meet the standard of a
19 process to inform a reasonable decision because of failure to consider future
20 CO2 emission regulation at the time of its decision.

1 *Identify And Evaluate Alternatives For Compliance*

2 The primary method used by PacifiCorp for evaluation of compliance
3 alternatives was to perform BART analyses. PacifiCorp also had other
4 technical analyses prepared. With the exception of the Hunter Units 1 and 2,
5 which had no specific BART analysis, I conclude the analyses identified on
6 Staff/404 reasonably evaluated alternatives for compliance for each of the coal
7 plant units. Even without specific BART analyses for Hunter Units 1 and 2,
8 since Utah's state permit mandated specific pollution control equipment
9 projects, I conclude PacifiCorp also acted reasonably in regard to the Hunter
10 coal plant units.

11

12 *Identify Alternatives To Compliance*

13 PacifiCorp discusses at PAC/500 Teply/21 that there was one alternative to
14 compliance considered at the time these environmental compliance investment
15 decisions were made – idling a coal plant unit and replacing it with market
16 power purchases. The Company further presents a narrative discussing how
17 its capability to analyze other alternatives has improved during the years after
18 these environmental compliance investment decisions were made (PAC/500
19 Teply/93-95). Based upon this testimony, I conclude that PacifiCorp did
20 evaluate alternatives to compliance, used its latest analysis capability when it
21 made these decisions, and therefore acted reasonably.

22

23

Perform Life-Cycle Economic Analyses, Including Sensitivity Cases

PacifiCorp performed life-cycle economic analyses using the PVRR(d) method. In these analyses, the Company evaluated the benefits, or costs, associated with its environmental compliance investments compared with idling a coal plant unit and replacing it with market power purchases, on a coal plant unit-by-unit basis. The PVRR(d) analyses included estimates for environmental compliance investment capital costs through 2026 related to all but the potential CCR, effluent limit, and 316b requirements.⁸ These PVRR(d) analyses showed a benefit to customers for making all the known environmental compliance investments and continuing to operate each coal plant unit. But, as noted above, there were no sensitivity cases performed in the PVRR(d) analyses for variation in fuel or electricity cost, or for CO2 regulatory cost. Without sensitivity cases to evaluate how robust were the PVRR(d) analyses and resulting decisions I conclude the Company's life-cycle economic analyses failed to meet the standard of a process to inform a reasonable decision.

Make A Decision Based On The Aforementioned Information

A company would make decisions based on the information it gathered and the studies or analyses it performed. PacifiCorp's decision making process included evaluating the current regulatory requirements, factoring in existing operating requirements, fuel supply flexibility, equipment end of

⁸ Based on the Company's confidential response to Staff Data Request 138 1st Supplement.

1 life/performance considerations, and operational efficiencies (PAC/500
2 Teply/23); factoring in most emerging environmental regulations; conducting
3 analyses; and evaluating and following the analyses recommendations.⁹ I
4 conclude PacifiCorp acted reasonably overall, but did not meet the standard of
5 a process to inform a reasonable decision because of failure, at the time of its
6 decision making, to consider CO2 emission regulation, and failure to evaluate
7 the sensitivity of its PVRR(d) analyses to variations in fuel, electricity and CO2
8 regulatory cost.

9
10 *Re-Evaluate The Decision As Significant Milestones Are Reached*

11 I conclude PacifiCorp was reasonable in re-evaluating its environmental
12 compliance investment decisions as significant milestones were reached. This
13 conclusion is based on its updates to the PVRR(d) analyses in the Company's
14 annual business planning and integrated resource planning, which have
15 included proxy costs for CCR and 316b requirements (PAC/500, Teply/16-19),
16 the effect of possible CO2 regulatory cost, and variation in fuel and electricity
17 cost. These PVRR(d) updates continue to show benefit to customers for
18 making all the known environmental compliance investments and continuing to
19 operate each coal plant unit.

20
21

⁹ Largely presented at PAC/500, Teply/20-21.

1 *Balance Cost/Risk In Implementation Method*

2 PacifiCorp's effort to balance cost/risk in its implementation of the
3 environmental compliance investments was primarily through lump-sum,
4 turnkey, engineer, EPC contracts, with performance guarantees, resulting from
5 competitive bidding processes (PAC/500 Teply/11). I conclude this was a
6 commonly used approach to balance cost/risk and was a reasonable action.

7

8 *Actively Manage The Implementation To Assure Budget, Schedule And*
9 *Performance Compliance*

10 PacifiCorp actively managed the implementation to assure budget, schedule
11 and performance compliance through management oversight of the projects
12 and closely managing any project execution plan changes or potential contract
13 scope changes. I conclude this process was a reasonable action.

14

15 Before offering my conclusion of how PacifiCorp's decision making process
16 compares with the process I set forth above that a company would follow to
17 inform a reasonable decision, I want to highlight some relevant background
18 information. Beginning with PacifiCorp's 2011 IRP, and evolving further in its
19 IRP Supplement, the effect of possible CO2 regulatory cost has been included
20 in the PVR(d) analyses (PAC/500 Teply/93-98). The PVR(d) analyses
21 updates since decision making have been included in the Company's annual
22 business planning and integrated resource planning, and have included proxy
23 costs for CCR and 316b requirements and the effect of possible CO2

1 regulatory cost, and variation in fuel and electricity cost (PAC/500 Teply/16-19).

2 The PVRR(d) analyses updates continue to show benefit to customers for
3 making all the known environmental compliance investments and continuing to
4 operate each coal plant unit.¹⁰

5
6 In my discussion above I note two areas where PacifiCorp did not meet the
7 standard of what a company would do to inform a reasonable decision. The
8 areas include: failure to consider CO2 emission regulation at the time of its
9 decision; and failure to include, at the time of its decision, sensitivity cases for
10 variations in fuel, electricity and CO2 regulatory cost. There needs to be an
11 understanding that the Commission looks to the objective reasonableness of
12 the utility's action, taking into account facts and circumstances existing at the
13 time of the decision. The Commission has clarified that "if the record
14 demonstrates that a challenged business decision was reasonable, taking into
15 account established historical facts and circumstances, the utility's decision
16 must be upheld as prudent even if the record lacks detail on the utility's actual
17 subjective decision making process." (See Order No. 02-469 p. 5; *In re*
18 *PacifiCorp* (Commission adopting PacifiCorp's description of legal standard for
19 determining prudence.) Under this standard, a utility's action can be prudent
20 even if the process for making that decision has infirmities. A utility's decision
21 process is probative on whether the action itself is prudent, but under the

¹⁰ Typical of statement found at PAC/500 Teply/39.

1 Commission's prudence standard, the primary focus of the inquiry is on
2 reasonableness of the action, not on the process leading to it.

3
4 In drawing a conclusion about these decision process infirmities and how they
5 affected the ultimate decisions made by PacifiCorp, I am compelled to
6 conclude that had analyses been prepared at the time of decision making that
7 accounted for these infirmities, the analyses results and resulting decisions
8 would not likely have been different. I reach this conclusion by extrapolating
9 from updated PVRR(d) analyses that do account for CO2 emission regulation
10 and that do include sensitivity cases for variations in fuel, electricity and CO2
11 regulatory cost analysis. Based on these updated analyses, I can extrapolate
12 what the results would have been had these more robust analyses been done
13 at the time of the business decisions at issue. As a result, the identified
14 decision process infirmities do not ultimately alter the conclusion about
15 whether PacifiCorp met the reasonableness standard and therefore I conclude
16 that the Company's actions were reasonable.

17 **Q. WERE THE COAL PLANT ENVIRONMENTAL COMPLIANCE**
18 **INVESTMENTS INCLUDED IN THE COMPANY'S INTEGRATED**
19 **RESOURCE PLAN?**

20 A. No, not specifically.

21 **Q: DO THE COMMISSION'S IRP GUIDELINES, SET FORTH IN ORDER 07-**
22 **002 AND ORDER 08-339, CONTEMPLATE ANALYSIS OF INVESTMENTS**

**AT EXISTING PLANTS TO COMPLY WITH ENVIRONMENTAL
REGULATIONS?**

A: Yes. Guideline 8, adopted in Order 08-339, indicates that the utilities should develop compliance scenarios for meeting requirements that would limit future emissions of carbon dioxide, nitrogen oxides, sulfur oxides, and mercury. This guideline indicates that the utility should modify the projected lifetimes of resources in accordance with the various compliance scenarios. In addition, utilities have historically evaluated investments to extend the economic or physical lives of resources as part of developing alternative resource portfolios pursuant to Guidelines 4(h) and 4(c) adopted in Order 07-002.

**Q: SHOULD THE COMMISSION CLARIFY THAT IRP GUIDELINES 8 AND 4
CONTEMPLATE COMPREHENSIVE ANALYSIS OF INVESTMENTS TO
EXTEND THE PHYSICAL AND ECONOMIC LIVES OF EXISTING
RESOURCES, INCLUDING COAL PLANTS?**

A: Yes. I see the on-going need to analyze significant environmental compliance investments in the Company's IRP so that those investments will be fully disclosed, understood and evaluated in a public process, just as are other significant energy related investments. To help ensure an improved process going forward, I recommend that the Commission clarify in its order in this docket that existing IRP Guidelines 4 and 8 direct the utilities to consider and analyze all investments that would extend the economic and physical lives of existing plants. The Commission should

1 clarify that Guidelines 4 and 8 direct the utilities to evaluate investments that
2 would extend the economic and physical life of existing resources, including
3 evaluation of alternatives that would result in shorter life extensions, no
4 extension of the resource life, or shorten the assumed resource life. The
5 Commission should clarify that the IRP Guidelines also direct the utilities to
6 conduct risk analysis, including analysis of the risk of future environmental
7 regulation, to test whether the investment to extend the life of an existing
8 resource is part of an overall resource strategy with the best combination of
9 expected costs and associated risks for the utility and its customers.

10 **Q. DO THE COMPANY'S ENVIRONMENTAL COMPLIANCE INVESTMENTS**
11 **SUPPORT COMPLIANCE WITH FUTURE ENVIRONMENTAL**
12 **REGULATIONS?**

13 A. Yes. Based on my understanding of the environmental compliance projects
14 presented for compliance with the Regional SO₂ Milestone and Backstop
15 Trading Program, state-issued construction and operating permits, and state
16 implementation plans, I conclude they also support compliance with the post-
17 2018 BART requirements, and future MATS requirements. This conclusion
18 comports with PacifiCorp's contentions made at PAC/500, Teply/14-16.

19 **Q. DID THE COMPANY'S ECONOMIC ANALYSES CONSIDER THE COST**
20 **OF COMPLIANCE WITH ALL FUTURE ENVIRONMENTAL REGULATION**
21 **REQUIREMENTS?**

22 A. No. At the time of decision making the PVRR(d) analyses included estimates
23 for environmental compliance investment capital costs through 2026 related to

1 all but the potential CCR, effluent limit, and 316b requirements.¹¹ The specific
2 CCR, effluent limit, and 316b requirements were largely unknown at the time of
3 decision making and were not included, even in proxy form. In addition,
4 PacifiCorp's PVR(d) analyses did not include CO2 regulatory cost – in either
5 proxy form or sensitivity case form. Updates to the PVR(d) analyses since
6 decision-making have been included in the Company's annual business
7 planning and integrated resource planning, and have included proxy costs for
8 CCR and 316b requirements (PAC/500 Teply/16-19), the effect of possible
9 CO2 regulatory cost, and variation in fuel and electricity cost. The PVR(d)
10 updates continue to show benefit to customers for making all the known
11 environmental compliance investments and continuing to operate each coal
12 plant unit.¹²

13 **Q. WHAT ARE THE REQUIRED STEPS IN A BART ANALYSIS?**

14 A. Code of Federal Regulations at 40 C.F.R. § 51 Appendix Y, Section IV requires
15 the following BART analysis steps:

- 16 1. The identification of available, technically feasible, retrofit control options;
- 17 2. Consideration of any pollution control equipment in use at the source
18 (which affects the availability of options and their impacts);
- 19 3. The costs of compliance with the control options;
- 20 4. The remaining useful life of the facility;
- 21 5. The energy and non-air quality environmental impacts of compliance; and

¹¹ Based on the Company's confidential response to Staff Data Request 138 1st Supplement.

¹² Typical of statement found at PAC/500, Teply/39.

1 6. The degree of visibility improvement which may reasonably be anticipated
2 from the use of BART.

3 **Q. DID THE COMPANY'S BART ANALYSIS STEP 4 CONSIDER EARLY**
4 **RETIREMENT OF THE COAL PLANT UNITS?**

5 A. No.

6 **Q. WHY WASN'T EARLY RETIREMENT CONSIDERED IN STEP 4?**

7 A. The Company's BART analyses considered the remaining useful life as fixed,
8 in the traditional manner related to remaining depreciable life or remaining
9 physical life, rather than as a variable as was done in the BART analyses for
10 the Boardman Coal Plant in 2010. As the basis for describing the remaining
11 useful life as fixed, I considered that the BART determination guidelines for
12 Step 4¹³ state that, "for purposes of these guidelines, the remaining useful life
13 is the difference between: (1) The date that controls will be put in place, or you
14 are conducting the BART analysis; and (2) The date the facility permanently
15 stops operations. Where this affects the BART determination, this date should
16 be assured by a federally- or State-enforceable restriction preventing further
17 operation." The BART guidelines go on to discuss the case where an operator
18 may intend to shut down a source by a given date but retains flexibility to
19 continue operating beyond that date if conditions dictate.¹⁴ There is no
20 indication in the guidelines that the date is considered to be variable. However,
21 there also is no restriction on considering it to be variable. I conclude that prior
22 to the advancement in thinking brought about by the 2010 Boardman Coal

¹³ 40 C.F.R. § 51 Appendix Y Section IV. D. 4. K. 2.

¹⁴ 40 C.F.R. § 51 Appendix Y Section IV. D. 4. K. 3.

1 Plant BART analyses, considering the remaining useful life as fixed was a
2 reasonable action.

3 **Q. DID THE COMPANY'S BART ANALYSES CONCLUDE SELECTIVE**
4 **CATALYTIC REDUCTION (SCR) IS THE "BEST" ALTERNATIVE FOR**
5 **NO_x REDUCTION?**

6 A. No. PAC/502 lists SCR installation projects for Naughton Unit 3, and Jim
7 Bridger Units 1, 2, 3, and 4. The BART analyses prepared for these coal plant
8 units did not recommend SCR installation.¹⁵

9 **Q. WHY THEN IS SCR SCHEDULED TO BE INSTALLED AT NAUGHTON**
10 **UNIT 3, AND JIM BRIDGER UNITS 1, 2, 3, AND 4?**

11 A. Before answering this question, I want to note that SCR environmental
12 compliance investments are not included in this rate case. Also, while the
13 decision to install SCR at Naughton Unit 3 is listed on PAC/502 as being
14 scheduled for May 2012, PacifiCorp announced on April 9, 2012¹⁶ that in lieu of
15 installing SCR the Company would convert the coal plant unit to natural gas
16 fuel. In addition, no decision related to proceeding with SCR at the Jim Bridger
17 units has yet to be made.

18
19 In answer to the question, although the BART analyses did not conclude SCR
20 installation was the best alternative, the November 2010 BART Settlement
21 Agreement between PacifiCorp and the Wyoming Department of

¹⁵ BART analyses provided in response to Staff Data Request 137.

¹⁶ Wyoming Public Service Commission Docket 20000 400 EA 11, April 9, 2012 Chad A. Teply letter and attachments.

1 Environmental Quality (WDEQ) required said installation. The WDEQ required
2 SCR installation based on its Long-Term Strategy of the Wyoming §308
3 Regional Haze State Implementation Plan.¹⁷ Because PacifiCorp was required
4 by the WDEQ settlement agreement to install SCR at these coal plant units, I
5 conclude PacifiCorp was reasonable to anticipate doing so.

6 **Q. WHAT IMPACT ON THIS PRUDENCE DETERMINATION IS THERE FROM**
7 **EPA'S MAY 15, 2012 REJECTION OF THE WYOMING AND UTAH STATE**
8 **IMPLEMENTATION PLANS RELATED TO NOx?**

9 A. None. EPA's decision was made after PacifiCorp had completed the 12
10 environmental compliance investments. However, there may be an impact on
11 future prudence determinations.

12 **Q. WHAT IS YOUR CONCLUSION REGARDING THE PRUDENCE OF**
13 **PACIFICORP'S ENVIRONMENTAL COMPLIANCE INVESTMENTS?**

14 A. Based on my evaluation described above, I conclude PacifiCorp's actions to
15 make the environmental compliance investments in the Naughton Units 1 and
16 2, Dave Johnston Unit 4, Hunter Units 1 and 2, Wyodak, and Jim Bridger Unit 3
17 coal fired plants were reasonable and therefore was prudent.

18 **Q. DOES THIS CONCLUDE YOUR TESTIMONY?**

19 A. Yes.

¹⁷ BART Application Analysis, AP-6040, Department of Environmental Quality, Air Quality Division, May 28, 2009, page 56.

**PUBLIC UTILITY COMMISSION
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OREGON**

STAFF EXHIBIT 401

Witness Qualification Statement

June 20, 2012

WITNESS QUALIFICATION STATEMENT

NAME: Erik E. Colville, P.E.

EMPLOYER: Public Utility Commission of Oregon

TITLE: Senior Utility Analyst/Electric Rates and Planning

ADDRESS: 550 Capitol Street NE Suite 215, Salem, Oregon 97301-2115.

EDUCATION: Bachelor of Science in Agricultural Engineering
Washington State University, Pullman, WA, 1979

Master of Business Administration
City University, Seattle, WA, 1989

Licensed Professional Engineer since 1984, and licensed as such
in Oregon since 1997

EXPERIENCE: I have been employed by the Public Utility Commission of Oregon
since June of 2010. I am a Senior Utility Analyst in electric rates and
planning for the Electric and Natural Gas Division of the Utility
Program. Current responsibilities include lead analyst for integrated
resource planning, resource acquisition, the renewable portfolio
standard, and environmental related matters.

I have approximately 30 years of professional engineering
experience, including approximately 23 years:

- Relating to air, water and soil environmental issues; and
- Evaluating, planning, permitting, designing, and supporting
construction of energy generation facilities

CASE: UE 246
WITNESS: Erik Colville

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**Exhibits in Support
Of Opening Testimony**

June 20, 2012

Environmental Compliance Investments

Unit	Project	Amount (PAC Share)	Reference	Analyses			
				PVRR(d)	NOx Emission Reduction Technologies Study	BART Analysis	FGD Upgrade Study
Naughton Unit1	Wet Scrubber Addition	\$121 million	Page 29, PAC/500 Tepley	x		x	
Naughton Unit1	Low NOx Burner Addition	\$9 million	Page 31, PAC/500 Tepley	x	x	x	
Naughton Unit 2	Wet Scrubber Addition	\$155 million	Page 39, PAC/500 Tepley	x		x	
Naughton Unit 2	Low NOx Burner Addition	\$9 million	Page 41, PAC/500 Tepley	x	x	x	
Dave Johnston Unit 4	Dry Flue Gas Desulfurization and Fabric Filter	\$104 million	Page 48, PAC/500 Tepley	x		x	
Hunter Unit 1	Wet Scrubber Performance Upgrade	\$52 million	Page 60, PAC/500 Tepley	x		x	x
Hunter Unit 2	Wet Scrubber Performance Upgrade	\$25 million	Page 61, PAC/500 Tepley	x		x	x

Hunter Unit 2	Electrostatic Precipitator Conversion to Baghouse	\$1.5 million	Page 62, PAC/500 Tepley	x		x	
Hunter Unit 2	Low NOx Burner Addition	\$0.5 million	Page 62, PAC/500 Tepley	x	x	x	
Wyodak	Baghouse Addition	\$103 million	Page 71, PAC/500 Tepley	x		x	
Wyodak	Low NOx Burner Addition	\$11 million	Page 72, PAC/500 Tepley	x	x	x	
Jim Bridger Unit 3	Wet Scrubber Upgrade	\$17 million	Page 80, PAC/500 Tepley	x		x	

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STAFF EXHIBIT 403

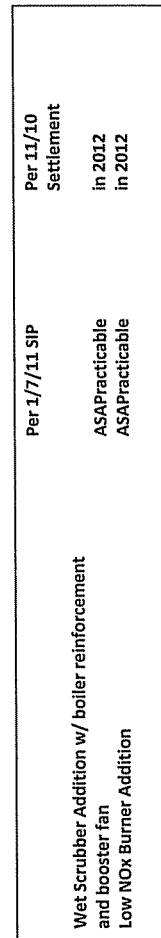
**Exhibits in Support
Of Opening Testimony**

June 20, 2012

Wet Scrubber Addn Req'd by
May 2012 (MD-5156)

Low NOx Brt NTP
April 2011

Low NOx Brn. req'd by May
2012 (MD-5156)



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STAFF EXHIBIT 404

**Exhibits in Support
Of Opening Testimony**

June 20, 2012

Technical Analyses Prepared by/for PacifiCorp

Multi-Pollutant Control Report, October 2002, Sargent and Lundy (referenced on page 36 of Teply testimony PAC/500).

NOx Emission Reduction Technologies Study, January 2005, Sargent and Lundy (referenced on page 36 of Teply testimony PAC/500).

BART Analysis for Naughton Units 1 Through 3, February 2007, CH2M Hill (referenced on page 36 of Teply testimony PAC/500).

BART Analysis for Dave Johnston Units 3 Through 4, February 2007, CH2M Hill (referenced on page 54 of Teply testimony PAC/500).

Hunter Station Units 1 and 2 FGD Upgrade Study, August 2007, Sargent and Lundy (referenced on page 66 of Teply testimony PAC/500).

BART Analysis for Wyodak, February 2007, CH2M Hill (referenced on page 76 of Teply testimony PAC/500).

BART Analysis for Jim Bridger Units 1 Through 4, January 2007, CH2M Hill (referenced on page 84 of Teply testimony PAC/500).