

Application No. 18-04-____
Exhibit PAC/400
Witness: Chad A. Teply

BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF CALIFORNIA

PACIFICORP

REDACTED

Direct Testimony of Chad A. Teply

Operational Necessity

Installation of Selective Catalytic Reduction Systems

April 2018

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ATTACHED EXHIBITS

- Exhibit PAC/401 – Best Practices in Electric Utility Integrated Resource Planning by
Regulatory Assistance Project and Synapse Energy Economics
- Confidential Exhibit PAC/402 – Cost Comparison to Complete Jim Bridger Unit 3 SCR
System
- Confidential Exhibit PAC/403 – Cost Comparison to Complete Jim Bridger Unit 4 SCR
System
- Exhibit PAC/ 404 – PacifiCorp Letter to Wyoming Department of Environmental Quality Air
Quality Division
- Exhibit PAC/405 – Wyoming Department of Environmental Quality Air Quality Division
Response to PacifiCorp

1 **Q. Please state your name, business address, and present position with PacifiCorp**
2 **d/b/a Pacific Power (PacifiCorp).**

3 A. My name is Chad A. Teply. My business address is 1407 West North Temple Street,
4 Suite 310, Salt Lake City, Utah 84116. My present position is Senior Vice President
5 of Strategy and Development.

6 **I. QUALIFICATIONS**

7 **Q. Please describe your education and professional experience.**

8 A. I have a Bachelor of Science degree in mechanical engineering from South Dakota
9 State University. I have held positions of increasing responsibility within various
10 Berkshire Hathaway Energy companies since November 1999. I joined PacifiCorp in
11 February 2009 as the Vice President of Resource Development and Construction. My
12 current responsibilities include the development and implementation of PacifiCorp's
13 major generation resource additions, major transmission and distribution project
14 delivery, major environmental compliance retrofit projects, and to a lesser extent
15 generation fleet repair and replacement projects. My organization also supports the
16 activities of PacifiCorp's integrated resource planning team.

17 **II. PURPOSE OF TESTIMONY**

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

19 A. My testimony supports the prudence and necessity of certain major capital projects
20 and associated costs incurred on coal-fired generation resources within the PacifiCorp
21 generation portfolio. In particular, my testimony supports the selective catalytic
22 reduction (SCR) systems retrofitted on Jim Bridger Units 3 and 4, Craig Unit 2, and
23 Hayden Units 1 and 2 included in this case, all of which were installed in accordance

1 with state and federal environmental compliance requirements for the individual
2 units. The analysis of these projects began in 2012 to meet applicable environmental
3 requirements in place at the time. The SCR systems reduced emissions at these units,
4 in compliance with those requirements. The Jim Bridger Units 3 and 4 SCR system
5 projects were placed in service in November 2015 and November 2016, the Craig
6 Unit 2 SCR system project was placed in service in December 2017, and the Hayden
7 Units 1 and 2 SCR system projects were placed in service in May 2015 and August
8 2016.

9 **Q. Please provide a general description of the SCR system retrofits and the benefits**
10 **gained from the projects.**

11 A. The SCR system projects included in this case and described further in testimony
12 below were required to comply with environmental laws, namely the Clean Air Act
13 Regional Haze Rules, established by the U.S. Environmental Protection Agency
14 (EPA) and administered by the respective state agencies in which the units reside.
15 The SCR system results in the reduction of oxides of nitrogen (NO_x) emissions.

16 **Q. Please provide a summary of PacifiCorp's cost to complete the SCR system**
17 **retrofits.**

18 A. The cost of the Jim Bridger Unit 3 SCR system included in this proceeding is
19 [REDACTED] on a total-company basis, or approximately [REDACTED] on a
20 California-allocated basis, and the cost of the Jim Bridger Unit 4 SCR system
21 included in this proceeding is [REDACTED] on a total-company basis, or
22 approximately [REDACTED] on a California-allocated basis. The cost of the Craig
23 Unit 2 SCR system included in this proceeding is [REDACTED] on a total-company

1 basis, or approximately [REDACTED] on a California-allocated basis. The cost of the
2 Hayden Unit 1 SCR system included in this proceeding is [REDACTED] on a total-
3 company basis, or approximately [REDACTED] on a California-allocated basis, and the
4 cost of the Hayden Unit 2 SCR system included in this proceeding is [REDACTED] on
5 a total-company basis, or approximately [REDACTED] on a California-allocated basis.

6 **Q. Which other witnesses in this proceeding provide testimony regarding the**
7 **prudence of the Jim Bridger SCR systems?**

8 A. Mr. Rick T. Link (Exhibit PAC/500) provides testimony explaining the economic
9 analysis used by PacifiCorp to support its decision to proceed with installation of the
10 Jim Bridger Units 3 and 4 SCR systems. These capital additions are included in the
11 existing rate base reflected in the revenue requirement incorporated in the exhibits of
12 Ms. Shelley E. McCoy (Exhibits PAC/1100 through Exhibits PAC/1104).

13 III. SCR SYSTEM INVESTMENTS

14 Jim Bridger Units 3 and 4 SCR Systems

15 **Q. Please describe the Jim Bridger facility.**

16 A. The Jim Bridger facility is a 2,111 MW, four-unit mine-mouth coal-fired electrical
17 generating facility located in Sweetwater County, Wyoming. All four units are
18 jointly-owned by PacifiCorp and Idaho Power Company. PacifiCorp's ownership
19 share is two-thirds of the power plant. PacifiCorp operates the Jim Bridger facility.

20 **Q. Please provide a general description of the Jim Bridger Units 3 and 4 SCR**
21 **systems.**

22 A. The Jim Bridger Units 3 and 4 SCR systems and associated ancillary equipment for
23 each unit serve to control oxides of nitrogen emissions. Each SCR system is

1 comprised of: two separate reactors, with multiple catalyst levels; inlet and outlet
2 ductwork; a shared ammonia reagent system; an economizer upgrade; structural
3 reinforcement of the boiler, air preheater, and flue gas path ductwork and equipment;
4 power distribution and electrical infrastructure installation and integration with the
5 existing plant; and an extension of the existing plant-wide distributed control system.
6 An induced draft fan upgrade and a corresponding auxiliary power system variable
7 frequency drive insertion was also required for Unit 4 only.

8 **Q. What was the required timeline for PacifiCorp to install the SCR systems at Jim**
9 **Bridger Units 3 and 4?**

10 A. The Clean Air Act Regional Haze Rules, the Jim Bridger facility Best Available
11 Retrofit Technology (BART) permit issued by the state of Wyoming, a BART appeal
12 settlement agreement with the state of Wyoming, and the Wyoming Regional Haze
13 State Implementation Plan (SIP) required the installation of the SCR systems on Unit
14 3 by the end of 2015, and on Unit 4 by the end of 2016.

15 **Q. Did EPA approve the state of Wyoming’s Regional Haze SIP compliance**
16 **requirements for Jim Bridger Units 3 and 4?**

17 A. Yes. EPA approved these requirements in its final Regional Haze Federal
18 Implementation Plan (FIP) for Wyoming published in the *Federal Register* on June 4,
19 2012. EPA subsequently reiterated its approval of these requirements in its updated
20 Regional Haze FIP for Wyoming published in the *Federal Register* on January 30,
21 2014. EPA’s final approval made these emissions reduction compliance requirements
22 at Jim Bridger Units 3 and 4 federally enforceable, in addition to being enforceable
23 under state law.

1 **Q. How did PacifiCorp assess the benefits associated with the Jim Bridger SCR**
2 **system projects described?**

3 A. PacifiCorp began its detailed economic assessment of the projects in 2012 to support
4 its Wyoming Certificate of Public Convenience and Necessity (CPCN) filings and its
5 Utah Voluntary Resource Procurement Decision filings for the projects. PacifiCorp
6 used the same analysis methodology and results to support its 2013 Integrated
7 Resource Plan (2013 IRP) filings and updates across its service territory states. The
8 proceedings associated with these various filings provided stakeholders an
9 opportunity for rigorous review of the projects prior to their implementation in the
10 2013 through 2016 timeframe, as facilitated by the statutes available and procedural
11 schedules used by the public utility commissions in each state. PacifiCorp's
12 economic analyses are detailed in the testimony of Mr. Link. The economic analyses
13 completed demonstrate that both of these projects were prudent, necessary, and in the
14 best interests of our customers.

15 **Q. Do the SCR systems at Jim Bridger Units 3 and 4 have the same general purpose**
16 **and scope?**

17 A. Yes. For this reason, my testimony references the SCR systems at both Jim Bridger
18 Units 3 and 4.

19 **Q. Did PacifiCorp file an application for a CPCN for the Jim Bridger Units 3 and 4**
20 **SCR systems in the state of Wyoming, where the projects are constructed?**

21 A. Yes. On August 7, 2012, PacifiCorp filed its application requesting a CPCN¹ with the
22 Wyoming Public Service Commission, in compliance with the Stipulation and

¹ Wyoming Public Service Commission Docket No. 20000-418-EA-12.

1 Agreement (2010 Wyoming Stipulation) approved in Wyoming Docket No. 20000-
2 384-ER-10 (2010 Wyoming Rate Case), to construct two major environmental
3 projects as provided in paragraph 13.b. of the 2010 Wyoming Stipulation. The
4 projects entailed the addition of SCR systems to Units 3 and 4 of the Jim Bridger
5 electric generating plant.

6 **Q. Did PacifiCorp file a Voluntary Request for Approval of Resource Decision to**
7 **Construct the Jim Bridger Units 3 and 4 SCR systems in the state of Utah?**

8 A. Yes. On August 24, 2012, PacifiCorp filed its application requesting the Public
9 Service Commission of Utah review and approve in advance of construction the Jim
10 Bridger SCR system projects.²

11 **Q. Did PacifiCorp include analysis of the Jim Bridger Units 3 and 4 SCR systems in**
12 **the company's 2013 IRP?**

13 A. Yes. PacifiCorp filed Confidential Volume III of the 2013 IRP on April 30, 2013.³
14 Confidential Volume III included detailed analysis of the Jim Bridger Units 3 and 4
15 SCR systems.

16 **Q. Have others in the industry recognized the high quality of PacifiCorp's resource**
17 **planning and modeling?**

18 A. Yes. In 2013, the Regulatory Assistance Project (RAP)⁴ co-authored a paper with the
19 consulting firm Synapse Energy Economics, Inc. (Synapse) on electric utility
20 resource planning. RAP and Synapse wrote that PacifiCorp's integrated resource

² Public Service Commission of Utah Docket No. 12-035-92.

³ Confidential Volume III of the 2013 IRP was filed in Idaho, Oregon, Utah, Washington, and Wyoming (available at <http://www.pacificorp.com/es/irp.html>).

⁴ "The Regulatory Assistance Project (RAP) is an independent, non-partisan, non-governmental organization dedicated to accelerating the transition to a clean, reliable, and efficient energy future." <http://www.raonline.org/about/>.

1 planning uses “progressive methodologies and contain[s] modern elements that
2 contribute to the production of high-quality plans that are useful examples of superior
3 resource planning efforts.”⁵ The publication further describes PacifiCorp’s System
4 Optimizer Model, which was used to evaluate the SCR systems, as the “most
5 comprehensive” model RAP and Synapse examined for the report.⁶

6 **Q. How did the Jim Bridger Units 3 and 4 SCR systems project cost information
7 incorporated into PacifiCorp’s Wyoming CPCN and Utah Resource Decision
8 applications compare to the company’s 2013 IRP analysis of the project?**

9 A. PacifiCorp used the same project cost information as the baseline for the Wyoming
10 CPCN and Utah Resource Decision applications, as well as for the company’s 2013
11 IRP.

12 **Q. Did the Public Service Commission of Utah approve PacifiCorp’s request for a
13 Resource Decision?**

14 A. Yes. On May 10, 2013, the Public Service Commission of Utah approved the
15 company’s request for a Resource Decision to add SCR systems on Jim Bridger Units
16 3 and 4.

17 **Q. Did the Wyoming Public Service Commission approve PacifiCorp’s request for a
18 CPCN?**

19 A. Yes. On May 29, 2013, the Wyoming Public Service Commission approved
20 PacifiCorp’s request for a CPCN to add SCR systems on Jim Bridger Units 3 and 4.

⁵ Exhibit PAC/401 Best Practices in Electric Utility Integrated Resource Planning, Page 3.

⁶ *Id.* at page 23.

1 **Q. Before executing the engineering and procurement contract (EPC), did**
2 **PacifiCorp engage in a multi-year process to develop, study, review, and obtain**
3 **initial regulatory approvals for the Bridger SCR systems?**

4 A. Yes. This process began with the issuance of Wyoming's SIP in 2008, which led to a
5 lengthy environmental permitting process. In August 2012, PacifiCorp initiated a
6 CPCN proceeding in Wyoming and a pre-approval proceeding in Utah, resulting in
7 highly scrutinized and publicized regulatory reviews that lasted until May 2013. In
8 April 2013, PacifiCorp completed its 2013 IRP, which contained a comprehensive
9 review of the Bridger SCR systems.

10 **Q. Did PacifiCorp receive prior approval or acknowledgement of the Bridger SCR**
11 **system projects from all states?**

12 A. PacifiCorp received prior approval in Utah and Wyoming issued a CPCN determining
13 that the investment was necessary. The Public Utility Commission of Oregon
14 declined to acknowledge the Bridger SCR system installations in the 2013 IRP, but
15 understood that PacifiCorp would complete the investments and agreed to undertake a
16 thorough and fair review of the prudence in a future rate case proceeding.⁷ In
17 Washington, PacifiCorp's 2013 IRP Update responded to the Washington Utilities and
18 Transportation Commission's 2013 IRP acknowledgement letter, which asked the
19 company to review the natural gas and carbon price assumptions in its SCR
20 analysis. PacifiCorp reported the results of its review to the Commission in a
21 separate appendix to its 2013 IRP Update.

⁷ *In the matter of PacifiCorp, dba Pacific Power 2013 Integrated Resource Plan*, Docket No. LC 57, Order No. 14-252 at 8-9 (July 08, 2014)(available at: <http://apps.puc.state.or.us/edockets/orders.asp?OrderNumber=14-252>).

1 **Q. Did the detailed evaluation of the Bridger SCR systems that occurred as part of**
2 **this multi-year process inform PacifiCorp’s decision to move forward with this**
3 **investment?**

4 A. Yes. The Bridger SCR systems were fully vetted in numerous different processes,
5 helping to confirm that they were the best compliance option for customers.

6 **Q. Have you prepared a timeline of the Bridger SCR system projects from the draft**
7 **Wyoming SIP to the final completion date?**

8 A. Yes. Table 1 below provides a list of the major milestones for the Bridger SCR
9 projects.

Table 1—Bridger SCR System Projects Timeline

Date	Milestone
May 22, 2008	Wyoming Regional Haze SIP (revised)
December 31, 2009	Jim Bridger BART Permit
February 26, 2010	PacifiCorp Appeal of BART Permit
November 2, 2010	Wyoming BART Appeal Settlement (Bridger SCR Requirement)
December 23, 2010	Jim Bridger BART Permit Amendment
January 7, 2011	Wyoming Regional Haze SIP (revised)
June 4, 2012	EPA Wyoming FIP Proposal
August 7, 2012	Wyoming CPCN Application
August 24, 2012	Utah Pre-approval Application
April 30, 2013	PacifiCorp 2013 IRP Confidential Volume III Filed
May 10, 2013	Utah Pre-approval Order
May 30, 2013	Wyoming CPCN Approval Order
May 31, 2013	EPC LNTP
June 28, 2013	Idaho Power Company's Wyoming CPCN Application
December 1, 2013	EPC FNTP
December 2, 2013	Idaho Power Company's Wyoming CPCN Approval Order
January 30, 2014	EPA Wyoming FIP Final Action
March 31, 2014	PacifiCorp 2013 IRP Update Confidential Exhibit F Filed
November, 2015	Jim Bridger 3 SCR system in service
December 31, 2015	Jim Bridger 3 SCR Compliance Deadline
November, 2016	Jim Bridger 4 SCR system in service
December 31, 2016	Jim Bridger 4 SCR Compliance Deadline

1 **Q. Why did PacifiCorp not defer the start of planning for the SCR systems until**
 2 **after the EPA's final action in January 2014?**

3 A. PacifiCorp was required to comply with the timelines set in Wyoming's SIP.
 4 Considering the complexity of the Bridger SCR systems and the lengthy project
 5 timeline described in Table 1, the Public Service Commission of Utah and the
 6 Wyoming Public Service Commission found the timing of PacifiCorp's investment
 7 was appropriate.

1 **Q. Did PacifiCorp query the state of Wyoming regarding the enforceability and**
2 **applicability of its obligations under the SIP?**

3 A. Yes. The state of Wyoming responded that PacifiCorp was required to comply with
4 the deadlines set in the Wyoming SIP. PacifiCorp's request and the state's response
5 are attached as Exhibit PAC/402 and Exhibit PAC/403, respectively.

6 **Q. When was the EPC contract executed and the contractor released to begin**
7 **work?**

8 A. The Jim Bridger Units 3 and 4 SCR EPC contract was executed by the parties on May
9 31, 2013. The EPC contract included a limited notice to proceed (LNTP) provision
10 that initially released the selected EPC contractor to begin scheduled critical activities
11 only for a period of time while parallel path permitting and regulatory proceedings
12 (e.g., environmental agency Regional Haze activities and integrated resource planning
13 reviews) continued. PacifiCorp gave full notice to proceed (FNTP) to the EPC
14 contractor effective on December 1, 2013, under negotiated EPC contract provisions
15 that were established to maintain project cost and schedule certainty. The EPC
16 contractor's construction site mobilization began in December 2013.

17 **Q. Prior to issuing full notice to proceed, did PacifiCorp confirm current market**
18 **conditions and economics?**

19 A. Before issuing the FNTP, PacifiCorp reviewed all key decision factors, including: (1)
20 its September 2013 official forward price curve (the most recent at the time of issuing
21 the FNTP), which remained well above the SCR system's break-even point; (2) 10-
22 year projected Jim Bridger fuel costs were not projected to increase significantly; and
23 (3) a [REDACTED] cost reduction PacifiCorp negotiated in the EPC

1 contract. PacifiCorp also verified that none of its third-party forecast providers had
2 projected increases in carbon costs in response to President Obama's June 2013
3 Presidential Memorandum regarding carbon emissions.

4 I personally conducted this review of the Jim Bridger SCR systems
5 investment and recommended issuance of the FNTTP. I would not have recommended
6 issuance of the FNTTP without considering all material factors and determining that
7 the SCR systems investment remained the best compliance choice for
8 customers. During the same timeframe, PacifiCorp elected to close other coal plants
9 or pursue conversion to natural gas. In each case, PacifiCorp's decision was based on
10 the economics of the compliance option for customers, not a predetermined
11 preference or investment agenda.

12 **Q. Did PacifiCorp update its original 2013 IRP Confidential Volume III analysis of**
13 **the Jim Bridger Units 3 and 4 SCR systems?**

14 A. Yes. PacifiCorp included its updated analysis of the Jim Bridger Units 3 and 4 SCR
15 system projects in Confidential Appendix F in its 2013 IRP Update completed on
16 March 31, 2014, which specifically addressed potential changes in carbon regulation
17 and natural gas market cost impacts.

18 **Q. What was the status of the Jim Bridger Units 3 and 4 at this point in time?**

19 A. At the time of the Confidential Appendix F filing, the EPC contractor had been issued
20 FNTTP and was in the process of detailed engineering and procurement of materials
21 for the SCR system projects.

1 **Q. Did PacifiCorp's updated review of potential carbon regulation and natural gas**
2 **forward price curves in its 2013 IRP Update, finalized March 31, 2014, result in**
3 **changes to its earlier economic analysis of the Jim Bridger Units 3 and 4 SCR**
4 **systems?**

5 A. No. The forecast proxy costs for carbon regulations and natural gas included in the
6 2013 IRP Update remained within the ranges initially assessed.

7 **Q. What was PacifiCorp's cost to complete the Jim Bridger Unit 3 SCR system?**

8 A. The cost of the Jim Bridger Unit 3 SCR system included in this proceeding is
9 [REDACTED] on a total-company basis, or approximately [REDACTED] on a
10 California-allocated basis. The total-company cost to complete the Jim Bridger Unit
11 3 SCR system was approximately [REDACTED] less than the corresponding cost
12 originally assessed in the Wyoming CPCN and Utah Resource Decision applications,
13 as well as in the 2013 IRP. A cost comparison is shown in Confidential Exhibit
14 PAC/404.

15 **Q. Did PacifiCorp prudently manage the implementation of the Jim Bridger Unit 3**
16 **SCR system?**

17 A. Yes. Beyond management of project costs as mentioned above, PacifiCorp's project
18 team prudently implemented and maintained an appropriate procurement strategy,
19 project controls, and status reporting to ensure compliance with contract safety
20 program implementation, technical specification requirements, scope of work
21 definition, critical path schedules, quality assurance, commissioning plans, and
22 turnover to operations plans, among other things.

1 **Q. What is the major maintenance overhaul cycle interval for Jim Bridger Units 3**
2 **and 4?**

3 A. Jim Bridger Units 3 and 4 are maintained on a four-year maintenance outage cycle
4 based on PacifiCorp's operating experience with the Jim Bridger units. The outage
5 cycle has been established to optimize unit reliability and availability, while
6 maintaining an appropriate balance of major maintenance outage scope and costs.
7 The implementation schedules of the Jim Bridger SCR system projects were aligned
8 with the established major maintenance overhaul cycles for the individual units.

9 **Q. What is the current status of the Jim Bridger Unit 3 SCR system?**

10 A. The Jim Bridger Unit 3 SCR system was placed in service in November 2015,
11 following the planned major maintenance overhaul for Unit 3. PacifiCorp's
12 environmental compliance deadline as established by the governing permits,
13 implementation plans, and agreements described earlier in this testimony was
14 December 31, 2015, for Unit 3. Completion of the Jim Bridger Unit 3 SCR system
15 satisfied the compliance deadlines established for the unit, as well as the prescribed
16 emissions reductions.

17 **Q. Please confirm that the drivers, general description, and rationale for the Jim**
18 **Bridger Unit 4 SCR system was consistent with that provided above for the Jim**
19 **Bridger Unit 3 SCR system.**

20 A. The drivers, general description, and rationale for the Jim Bridger Unit 4 SCR system
21 all mirror the information provided above for the Jim Bridger Unit 3 SCR system.

1 **Q. When was the Unit 4 SCR EPC contract executed and the contractor released to**
2 **begin work?**

3 A. A single EPC contract was executed for the Jim Bridger Units 3 and 4 SCR systems,
4 the timeline of which is described above.

5 **Q. What was PacifiCorp's cost to complete the Jim Bridger Unit 4 SCR system?**

6 A. The cost of the Jim Bridger Unit 4 SCR system included in this proceeding is
7 [REDACTED] on a total-company basis, or approximately [REDACTED] on a
8 California-allocated basis. PacifiCorp's total-company cost to complete the Jim
9 Bridger Unit 4 SCR system was approximately [REDACTED] less than the
10 corresponding cost originally assessed in the Wyoming CPCN and Utah Resource
11 Decision applications, as well as in the 2013 IRP. A cost comparison is shown in
12 Confidential Exhibit No. PAC/405.

13 **Q. Did PacifiCorp prudently manage implementation of the Jim Bridger Unit 4**
14 **SCR system?**

15 A. Yes. The testimony I provided above relating to the prudent management of the Jim
16 Bridger Unit 3 SCR system is also applicable to the Jim Bridger Unit 4 SCR system.

17 **Q. What is the current status of the Jim Bridger Unit 4 SCR system?**

18 A. The Jim Bridger Unit 4 SCR system was placed in service in mid-November 2016,
19 following the planned major maintenance overhaul for Unit 4. PacifiCorp's
20 environmental compliance deadline as established by the governing permits,
21 implementation plans, and agreements described earlier in this testimony was
22 December 31, 2016, for Unit 4. Completion of the Jim Bridger Unit 4 SCR system

1 satisfied the compliance deadlines established for the unit, as well as the prescribed
2 emissions reductions.

3 **Craig Unit 2 SCR System**

4 **Q. Please describe the Craig facility.**

5 A. The Craig facility is a three-unit coal-fired electrical generating facility located in
6 Routt County, Colorado. Units 1 and 2 (855 MW), are jointly owned by Tri-State
7 Generation and Transmission Association, Inc. (Tri-State), Salt River Project, Platte
8 River Power Authority, Public Service Company of Colorado, and PacifiCorp
9 (PacifiCorp owns 19.28 percent of the units). Unit 3 is solely owned by Tri-State.
10 Tri-State operates all units at the facility.

11 **Q. Please provide a general description of the Craig Unit 2 SCR system.**

12 A. Generally consistent with the description provided for the Jim Bridger Units 3 and 4
13 SCR systems, the Craig Unit 2 SCR system is primarily comprised of: a reactor with
14 multiple catalyst levels; inlet and outlet ductwork; an ammonia reagent system;
15 certain boiler structure and ancillary infrastructure retrofits; electrical and control
16 system installation; and integration with the existing plant.

17 **Q. What was the required timeline for Tri-State to install the SCR system at Craig
18 Unit 2?**

19 A. The Craig Unit 2 SCR system was required by the Clean Air Act Regional Haze
20 Rules and the associated state of Colorado Regional Haze SIP to be installed by
21 January 30, 2018. Colorado's Regional Haze SIP was first approved by the Colorado
22 Air Quality Control Commission in January 2011, and was submitted to EPA for
23 review and approval on May 25, 2011.

1 **Q. Did EPA approve the State of Colorado’s Regional Haze SIP compliance**
2 **requirements for Craig Unit 2?**

3 A. Yes. EPA published its approval of the Colorado Regional Haze SIP compliance
4 requirements for Craig Unit 2 in the *Federal Register* on December 31, 2012.⁸ EPA’s
5 final rule became effective January 30, 2013.

6 **Q. Please generally describe the joint ownership governance of Craig Unit 2.**

7 A. The terms and conditions of joint ownership in Craig Unit 2 are governed by a
8 Participation Agreement. The Participation Agreement mandates the installation of
9 capital improvements that are required by applicable law. The Participation
10 Agreement also places an independent obligation on Tri-State, as Operating Agent, to
11 operate Craig Unit 2 in accordance with applicable laws. The applicable laws
12 requiring the Craig Unit 2 SCR system installation are discussed above in my
13 testimony.

14 As Operating Agent, Tri-State is also responsible for development of
15 operating budgets and capital investment recommendations to be set forth for joint
16 owner review and approvals. The Participation Agreement’s provisions for approval
17 of capital expenditures requires that the proposed expenditures be included in the
18 annual capital expenditure budget prepared by the Operating Agent and that the
19 annual capital expenditure budget is approved by a majority vote (i.e. greater than
20 50 percent ownership share) of the joint owners.

⁸ <https://www.epa.gov/sites/production/files/2014-02/documents/epafinalactiononcoloradoregionalhazeplan.pdf>; <http://www2.epa.gov/region8/air-program>.

1 **Q. Did Tri-State request approval of the Craig Unit 2 SCR system investment in**
2 **accordance with the terms of the Participation Agreement and was it approved**
3 **by greater than 50 percent ownership share of the joint owners?**

4 A. Yes. Tri-State initially included costs associated with the Craig Unit 2 SCR system in
5 the 2013 capital expenditures budget for review and approval pursuant to the
6 Participation Agreement. The project was approved by a greater than 50 percent
7 ownership share of the joint owners.

8 **Q. Did PacifiCorp independently assess the benefits associated with the Craig Unit**
9 **2 SCR system project?**

10 A. Yes. In July 2013, PacifiCorp independently assessed the benefits associated with the
11 Craig Unit 2 SCR system project against a hypothetical wherein PacifiCorp could
12 unilaterally effectuate an accelerated shutdown of the unit. This hypothetical was not
13 a realistic option because PacifiCorp cannot unilaterally effectuate an accelerated
14 shutdown of the Craig units based on the language of the Participation Agreement.
15 PacifiCorp's hypothetical did not favor the installation of an SCR system.

16 **Q. What position did PacifiCorp take with respect to the Craig Unit 2 SCR system**
17 **project capital budget approval?**

18 A. PacifiCorp voted "no" with respect to the Craig Unit 2 SCR system project.
19 PacifiCorp recognized that under the terms of the Participation Agreement its "no"
20 vote alone would not change the outcome with the other joint-owners voting "yes",
21 and the company remained obligated to pay its share of the Craig Unit 2 SCR system.

1 **Q. Did PacifiCorp also independently assess its legal options with respect to the**
2 **capital expenditures approval process incorporated into the Participation**
3 **Agreement?**

4 A. Yes. In June 2013, PacifiCorp engaged internal and external counsel to
5 independently assess the company's rights under the Participation Agreement with
6 respect to payment options and dispute resolution that may occur with a majority
7 decision on capital expenditures that was not supported by PacifiCorp. The ultimate
8 determination of the internal and external legal reviews of the Participation
9 Agreement was that PacifiCorp had the right to challenge the majority's decision, but
10 there was little to no opportunity to successfully challenge the project through
11 arbitration or litigation. This was primarily because the project met the requirements
12 under the Participation Agreements, specifically: (i) the project is required by
13 applicable law (the Colorado Regional Haze SIP); (ii) Craig Unit 2 is required to be
14 operated in accordance with applicable law under the Participation Agreement; and
15 (iii) the majority of the Craig Unit 2 joint-owners (in fact all other than PacifiCorp)
16 voted in support of the project.

17 **Q. Considering the terms and conditions of the Participation Agreement, did**
18 **PacifiCorp pursue arbitration or litigation of the Craig Unit 2 SCR system**
19 **project decision?**

20 A. No, for the reasons explained above.

21 **Q. What was PacifiCorp's cost to complete the Craig Unit 2 SCR system?**

22 A. The cost of the Craig Unit 2 SCR system included in this proceeding is [REDACTED]
23 on a total-company basis, or approximately [REDACTED] on a California-allocated

1 basis with an in-service date of December 2017.

2 **Q. What is the current status of the Craig Unit 2 SCR system?**

3 A. The Craig Unit 2 SCR system was placed in service in December 2017, following the
4 planned major maintenance overhaul for the unit. Completion of the Craig Unit 2
5 SCR system satisfied the compliance deadlines established for the unit, as well as the
6 prescribed emissions reductions.

7 In each case, installation of these major emissions control retrofit projects
8 have been aligned with scheduled major maintenance outages for the affected units to
9 mitigate replacement power cost impacts while benefiting from overlapping major
10 maintenance outage time frames. These environmental compliance projects allow the
11 retrofitted facilities to continue to operate as low-cost generation resources for the
12 benefit of customers.

13 **Hayden Units 1 & 2 SCR Systems**

14 **Q. Please describe the Hayden Facility.**

15 A. The Hayden plant is a 446 MW, two-unit coal-fired electrical generating facility
16 located in Routt County, Colorado. Unit 1 is jointly owned by Public Service
17 Company of Colorado (PSCo) and PacifiCorp (PacifiCorp owns 24.5 percent). Unit 2
18 is jointly owned by PSCo, Salt River Project, and PacifiCorp (PacifiCorp owns
19 12.6 percent). PSCo operates the plant.

20 **Q. Please provide a general description of the Hayden Units 1 and 2 SCR systems.**

21 A. Generally consistent with the description provided for the Jim Bridger Units 3 and 4
22 SCRs, the Hayden Units 1 and 2 SCR systems are primarily comprised of: reactors
23 with multiple catalyst levels; inlet and outlet ductwork; ammonia reagent systems;

1 certain boiler structures and ancillary infrastructure retrofits; electrical and control
2 systems installation; and integration with the existing plant.

3 **Q. What was the required timeline for PacifiCorp to install the SCR systems at**
4 **Hayden Units 1 and 2?**

5 A. The Hayden Units 1 and 2 SCR systems were required by the State of Colorado's
6 Regional Haze SIP to be installed no later than December 31, 2016.

7 **Q. Did EPA approve the state of Colorado's Regional Haze SIP compliance**
8 **requirements for Hayden Units 1 and 2?**

9 A. Yes. The EPA published its approval of the Colorado Regional Haze SIP in the
10 Federal Register on December 31, 2012.⁹ EPA's final approval made these emissions
11 reduction compliance requirements at Hayden Units 1 and 2 federally enforceable, in
12 addition to being enforceable under state law.

13 **Q. What regulations required the Hayden Units 1 and 2 SCR system projects to be**
14 **installed?**

15 A. In December 2010, the Colorado Air Quality Control Commission promulgated new
16 BART determinations and emissions control requirements for the Hayden units in the
17 Colorado Regional Haze SIP. These BART determinations set emissions limits of
18 0.08 lbs NO_x/MMBtu for Hayden Unit 1 and 0.07 lbs NO_x/MMBtu for Hayden Unit
19 2. Although the BART determinations did not specify how these limits were to be
20 achieved, installation of SCR systems was the only technically feasible method
21 available.

⁹ <https://www.epa.gov/sites/production/files/2014-02/documents/epafinalactiononcoloradoregionalhazeplan.pdf>; <http://www2.epa.gov/region8/air-program>.

1 The Hayden Unit 1 SCR system was also a key component of the NO_x
2 reduction plan required by PSCo (the operator of Hayden Unit 1) to the Colorado
3 Public Utilities Commission under the Colorado Clean Air Clean Jobs Act. The
4 Colorado Public Utilities Commission approved PSCo's NO_x reduction plan,
5 including the Hayden Unit 1 SCR system project, on December 9, 2010.

6 **Q. Was a CPCN acquired for the Hayden Units 1 and 2 SCR systems in the state of**
7 **Colorado, where the projects were constructed?**

8 A. On January 26, 2011, the Colorado Public Utilities Commission found that the
9 Hayden Units 1 and 2 SCR systems were necessary and in the public interest.¹⁰
10 PSCo's request for a CPCN for the SCR systems was subsequently granted by the
11 Colorado Public Utilities Commission.¹¹

12 **Q. Please generally describe the joint ownership governance of Hayden Units 1 and**
13 **2.**

14 A. The terms and conditions of joint ownership in Hayden Units 1 and 2 are governed by
15 a Participation Agreement. The Participation Agreement mandates the installation of
16 capital improvements that are required by applicable law. The Participation
17 Agreement also places an independent obligation on PSCo, as Operating Agent, to

¹⁰ *In re Public Service Co. of Colorado's Plan in Compliance with House Bill 10-1365*, "Clean Air-Clean Jobs Act, Docket No. 10M-245E, Decision No. C10-1328 (January 26, 2011)(available at: http://www.google.com/url?sa=t&ret=j&q=&esrc=s&source=web&cd=1&ved=0ahUKEwisv6r2xPHZAhXnr1OKHUt5BhYQFggnMAA&url=http%3A%2F%2Fwww.dora.state.co.us%2FPUC%2FDocketsDecisions%2Fdecisions%2F2010%2FC10-1328_10M-245E.doc&usg=AOvVaw016pmadIR-vCs3VyPuOf5l)

¹¹ *In the matter of the Application of Public Service Co. of Colorado for a Certificate of Public Convenience and Necessity for the Hayden Emissions Control Project*, Docket No. 11A917E, Recommended Decision R12-0593 (June 1, 2012 (available at: http://www.dora.state.co.us/puc/docketsdecisions/decisions/2012/R12-0593_11A-917E.doc); Order Denying Exceptions, Decision C12-0843 (July 24, 2012)(available at: http://www.dora.state.co.us/puc/docketsdecisions/decisions/2012/C12-0843_11A-917E.doc).

1 operate Hayden Units 1 and 2 in accordance with applicable laws. The applicable
2 laws requiring the Hayden Units 1 and 2 SCR systems installation are discussed
3 above in my testimony.

4 **Q. Were the SCR system projects intended to extend the operational life of Jim**
5 **Bridger Units 3 and 4, Craig Unit 2, or Hayden Units 1 and 2?**

6 A. No. The SCR system projects were required to continue operations in Wyoming and
7 Colorado to meet state requirements.

8 **IV. CONCLUSION**

9 **Q. Do you have any final comments?**

10 A. Yes. PacifiCorp prudently managed the analysis, implementation, and costs of the
11 Jim Bridger Units 3 and 4 SCR system projects. The projects were analyzed and
12 managed in accordance with PacifiCorp's environmental compliance obligations, the
13 Wyoming Public Service Commission Order granting a CPCN for the projects, the
14 Public Service Commission of Utah Order granting Resource Decision Pre-approval
15 for the projects, and the company's integrated resource planning processes.

16 PacifiCorp completed the Jim Bridger Units 3 and 4 systems on time to meet all
17 environmental compliance deadlines and performance requirements under budget,
18 further supporting the prudence of the project.

19 PacifiCorp also prudently managed the analysis and appropriately exercised
20 its rights under the Participation Agreement with respect to the Craig Unit 2 SCR
21 system project. The project was completed on time to meet all environmental
22 compliance deadlines and performance requirements, and was administered by the

1 plant Operating Agent, and supported by a majority vote of the unit's remaining joint
2 owners, in accordance with Participation Agreement terms and conditions.

3 PacifiCorp's support of the Hayden Units 1 and 2 SCR system installations
4 included in this case has been administered pursuant to applicable law and the
5 Partnership Agreement applicable to those units.

6 These environmental compliance projects have reduced emissions and
7 allowed the retrofitted facilities to continue to operate as low-cost generation
8 resources for the remainder of the units lives to benefit PacifiCorp's customers.
9 Accordingly, the investments should be approved as prudent expenditures.

10 **Q. Does this conclude your direct testimony?**

11 A. Yes.