



Before the Public Service Commission of  
The State of North Dakota

In the Matter of the Application of  
BASIN ELECTRIC POWER COOPERATIVE  
For A Certificate of Site Compatibility for the  
Pioneer Generation Station Phase III Project

Case No. PU-14-829

Pre-filed Testimony  
of  
Josh Rossow

1 Q. **Mr. Rossow, please give us your name, business address and your**  
2 **occupation?**

3  
4 A. My name is Josh Rossow. I am employed as a Project Manager for Basin Electric  
5 Power Cooperative, 1717 East Interstate Avenue, Bismarck, North Dakota.

6  
7 Q. **What is your employment history with Basin Electric?**

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9 A. I have been employed with Basin Electric for over 8 years, holding the positions of  
10 Performance Engineer, Environmental Coordinator and Project Manager. Prior to  
11 working at Basin Electric, I was employed with LAS International as a mechanical  
12 engineer.

13  
14 Q. **Please state your educational background.**

15  
16 A. I received a Bachelor of Science degree in Mechanical Engineering from South  
17 Dakota School of Mines & Technology, and I have been a Registered Professional  
18 Engineer in the State of North Dakota since 2011.

19  
20 Q. **What have been your responsibilities in connection with the Pioneer**  
21 **Generation Station Phase III Project?**

22  
23 A. I am the Project Manager of the Pioneer Generation Station Phase III Project. This is  
24 the third phase of development at the Pioneer Generation Station (PGS), which is  
25 located 15 miles Northwest of Williston, ND.

26  
27 As Project Manager, I am responsible for management and coordination of all  
28 aspects of the Project including; technology selection, siting, permitting, finance,  
29 engineering design, construction and start-up. Responsibilities also include  
30 coordinating utility interconnects such as water, natural gas and transmission.

31  
32 Q. **What is the purpose of your testimony in this proceeding?**

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1 A. The purpose of my testimony is to provide a description of Basin Electric Power  
2 Cooperative, a description of the proposed Project, and Basin Electric's position with  
3 respect to the PSC Site Compatibility Policy Criteria, as presented initially in the  
4 Application filed by Basin Electric.

5

6 Q. **Would you please describe Basin Electric?**

7

8 A. Basin Electric is a regional wholesale electric generation and transmission  
9 cooperative organized under the laws of the State of North Dakota, and  
10 headquartered in Bismarck, North Dakota. Basin Electric provides power to 138  
11 member cooperatives serving more than 2.8 million consumers in nine states,  
12 including North Dakota. Basin Electric has two Class A members that serve what we  
13 refer to as the Williston Basin where the oil and gas development is occurring. The  
14 Cooperatives are Central Power Electric Cooperative, headquartered in Minot, ND  
15 and Upper Missouri G&T, headquartered in Sidney, MT.

16

17 Q. **You testified that this is the third Phase of development at the Pioneer  
18 Generation Station. Can you please describe Phase I & II?**

19

20 A. PGS was designed and constructed in two phases. In Phase I, one 45 megawatt  
21 simple cycle combustion turbine and associated balance of plant equipment, an  
22 operations & maintenance building, natural gas and water interconnects and a 115  
23 kilovolt transmission line were constructed. This combustion turbine was designated  
24 PGS Unit 1. Phase I went commercial in September 2013. Phase II consisted of two  
25 additional 45 megawatt simple cycle combustion turbines and associated balance of  
26 plant equipment. These combustion turbines were designated PGS Unit 2 and PGS  
27 Unit 3. PGS Unit 2 began commercial operation in February 2014, and Unit 3 was  
28 commercial in March 2014.

29

30 Q. **Please describe the proposed Pioneer Generation Station Phase III Project?**

31

32 A. The PGS Phase III Project consists of the addition of twelve 9.22 MW nominal  
33 megawatt gas reciprocating engines and auxiliaries with a total nominal electrical  
34 output of 111 megawatts. The twelve engines will be designated as PGS Units 11

1 through 22. A 115 kilovolt switchyard will also be constructed to connect the engines  
2 to the electrical grid.

3  
4 **Q. Where is the proposed Project located?**

5  
6 A. This facility is located approximately 15 miles northwest of Williston on the existing  
7 Pioneer Generation Station site. The site is adjacent to OneOK's Stateline Gas Plant  
8 and Mountrail-Williams Electric Cooperative Stateline Substation located in Section  
9 20, Township 155 North, Range 103 West in Williams County.

10  
11 **Q. Where will Phase III be located relative to the existing units?**

12  
13 A. Phase III will be located directly south of Phase I and II.

14  
15 **Q. Please describe the design of the proposed Project Basin Electric intends to  
16 construct.**

17  
18 A. Each of the twelve generating units will be 9.22 megawatt reciprocating engines  
19 manufactured by Wärtsilä and fueled by natural gas. The engines will be spark  
20 ignition, turbo-charged four-stroke engines. Each engine has twenty cylinders  
21 arranged in a "V" configuration. The engines operate at 720 revolutions per minute.  
22 A building will be constructed to house the engines.

23  
24 For the 12 engines there will be a total of two stacks; six engines will be vented to  
25 each stack. The engines utilize lean burn combustion techniques to minimize NOx  
26 emissions. Also, each engines has a Selective Catalytic Reduction (SCR) system for  
27 further NOx control. The SCR uses urea for the reagent. Also included will be a  
28 Catalytic Oxidation Reduction to minimize carbon monoxide (CO) emissions.  
29 Following the SCR, the exhaust from six engines will be released to the atmosphere  
30 through a common 170 foot tall stack.

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32 Noise from the engines will be minimized by sound dampening liners on the interior of  
33 the building and exhaust silencers. The air cooled radiators are also designed to  
34 minimize noise.

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Other major components of the design include:

- Two generator step-up transformers to increase the voltage from 13.8-kV to 115-kV for transmission
- A 115 kilovolt switchyard
- A 22,000 gallon urea storage tank
- Engine oil storage consisting of a 7,000 gallon new oil tank, 5,000 gallon service oil tank and a 5,000 gallon waste oil tank
- A fire protection system which includes a water storage tank, electric fire pump and diesel fire pump
- An 800 kilowatt emergency diesel generator to support the plant safety and control features during a power interruption.

**Q. What is the gas supply for the Project?**

A. Natural gas is transported to PGS by an 8-inch pipeline owned and operated by WBI Energy Transmission. In Phase I, WBI Energy Transmission installed approximately 1800 feet of 8 inch pipeline to interconnect PGS with WBI's Stateline Pipeline. The WBI Stateline Pipeline connects the OneOk Stateline Gas Processing Plant to the Northern Border Pipeline located south of the PGS site. The existing pipeline serving PGS is capable of accommodating the gas supply capacity needs of PGS Phase III. PGS Phase III requires modifications to the gas supply meters and approximately 700 feet of 6 inch gas supply line, all within the PGS site. Basin Electric will be working with a gas broker to purchase the natural gas needed for this Project.

**Q. Is there a backup fuel for the proposed Project if natural gas is unavailable?**

A. The engines are capable of using liquefied petroleum gas (LPG) as a backup fuel. The Project is designed to accommodate LPG tanks and supporting interconnections if backup fuel is deemed necessary in the future. The LPG tanks and associated infrastructure will not be initially installed. Basin Electric will be migrating into the Southwest Power Pool (SPP) in the fall of 2015. If and when SPP regulations require that PGS have a short term secondary fuel supply, the LPG system will be installed.

1 The size of the LPG tanks will likely be between 20,000 and 120,000 gallons,  
2 depending on SPP requirements.

3  
4 Q. **Why was this location chosen for Phase III?**

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6 A. The existing Pioneer Generation Station site was selected because of the proximity to  
7 an existing natural gas pipeline and electrical transmission lines. Space was also  
8 available on the property, making it unnecessary to purchase more land. Further, the  
9 ability to use existing infrastructure made the expansion of PGS the most economic  
10 site.

11  
12 Q. **Mr. Rossow, why were reciprocating engines chosen for Phase III instead of the**  
13 **simple cycle combustion turbines used in Phase I & II?**

14  
15 A. A generating unit is typically most efficient when it is operated at maximum capacity.  
16 Because the engines are roughly one-fifth the size of the combustion turbines,  
17 engines can be operated near maximum capacity and efficiency. Engines are then  
18 started and stopped as demand changes. Also, because of the large power demand  
19 in the area, unit reliability is extremely important. Multiple small units have an  
20 inherent redundancy compared to one larger unit. The fuel supply is the only single  
21 point of failure for the engines. Further, the combustion turbines currently operating  
22 in Basin Electric's fleet are at risk from environmental weather extremes. Operating  
23 experience has shown that protecting all equipment from the negative impacts of  
24 freezing in extremely cold weather is problematic. Reciprocating engines are  
25 protected from weather extremes by being placed within an enclosed building.

26  
27 Q. **Does the reciprocating engine technology currently exist within North Dakota?**

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29 A. It is quite common to generate electricity with diesel fueled compression ignition  
30 engines. However, the PGS reciprocating engines will be natural gas fueled spark  
31 ignition engines, which is less common. To my knowledge, these will be the largest  
32 reciprocating engines in North Dakota.

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34 Q. **What is the schedule of this project?**

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A. If all the necessary permits and approvals in place, Basin Electric intends to start construction in May of 2015. Construction will largely be complete by April 1st, 2016. Testing and commissioning will be performed from April 1st through June 1st, 2016. At that time the engines will be available for commercial operation.

**Q. Can you describe the sequence of construction of the Project?**

A. Construction will begin with site leveling and grading. After that, concrete foundations and underground utilities will be installed. When the foundations are complete, the buildings will be erected. Structures and equipment outside of the buildings such as the stacks and air cooled radiators will be constructed at the same time. When the buildings are mostly complete, mechanical and electrical installation will begin inside the buildings. The engines will be transported to the site via rail and heavy haul trucks. Heavy haul trucks will move the engines into the building through a temporary opening in the building wall and then rigged into final position. Startup and commissioning will begin when the project is mechanically and electrically complete. During startup and commissioning, each system will be carefully tested to be sure the system is operating properly and safety systems are functioning. After each system has been commissioned and test run, reliability and emissions testing will be performed before declaring the plant available for commercial operation.

**Q. Can you describe the workforce needed to construct the Project?**

A. The construction labor force will peak at approximately 225 employees. The workforce will be made up of many different skilled trades such as electricians, pipefitters and iron workers. Local labor will be used to the extent practicable. However, because of the tight labor market in the region and low unemployment rates, it is anticipated that the majority of the construction workforce will come from outside the region.

**Q. Can you describe the method Basin Electric uses to select their contractors and how you insure that these contractors are committed to safety?**

1 A. Basin Electric pre-qualifies prospective contractors by examining their safety history.  
2 Only contractors which meet Basin's safety standards are allowed to bid on the work.  
3 The selected contractor is required to become a member of the Energy Coalition for  
4 Contractor Safety which is administered by the North Dakota Safety Council. The  
5 North Dakota Safety Council reviews the contractor's safety programs for compliance  
6 with Federal OSHA regulations. Once on site, regular safety inspections by Basin  
7 Electric ensure that the contractor is using safe work practices.

8

9 Q. **What is the estimated cost of the Project?**

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11 A. The estimated cost of the Project is \$161.2 million.

12

13 Q. **What standards has Basin Electric adopted in designing this Project?**

14

15 A. All design, construction and operation shall comply with applicable codes and  
16 standards including, but not necessarily limited to, the following:

- 17 • State and local codes, laws, ordinances, rules and regulations
- 18 • American Society of Mechanical Engineers (ASME)
- 19 • American Society for Testing and Materials (ASTM)
- 20 • American National Standards Institute (ANSI)
- 21 • Institute of Electrical and Electronic Engineers (IEEE)
- 22 • The Instrumentation, Systems, and Automation Society (ISA)
- 23 • National Fire Protection Association (NFPA)
- 24 • National Electrical Code (NEC)
- 25 • Occupational Safety and Health Act of 1970 (OSHA)
- 26 • Uniform Building Code (UBC)

27

28 Q. **How much water will the Project consume and where does the supply come  
29 from?**

30

31 A. The engines do not consume water during operation. The primary water  
32 consumption will be for employee potable uses. Other water consumption uses  
33 include minimal cooling system water makeup and refilling the fire water tank in the

1 event of an emergency. Water is supplied to PGS from the Williams Rural Water  
2 District distribution system.

3  
4 **Q. Will the water consumption rate for Pioneer Generation Station Project impact**  
5 **other customers of Williams Rural Water District?**

6  
7 A. No. Basin Electric works with the Williams Rural Water District to ensure other  
8 customers are not impacted.

9  
10 **Q. How does Basin Electric ensure underground public utilities are not damaged**  
11 **during construction of the project?**

12  
13 A. Basin Electric requires its contractors and sub-contractors to use the North Dakota  
14 One Call system to locate underground utilities at least 48 hours in advance of  
15 excavations. Contractors and sub-contractors are also required to hand dig or use  
16 vacuum excavation when excavating near underground utilities.

17  
18 **Q. Is any new electrical transmission needed for this Project?**

19  
20 A. Yes, approximately 2,500 feet of transmission line will be built by Sheridan Electric  
21 Cooperative to interconnect to the PGS Switchyard to Sheridan Electric Cooperative's  
22 115 kilovolt transmission line located on northern portion of the PGS Site. Most of the  
23 2500 feet of the transmission mile will be located on the PGS property.

24  
25 **Q. Are you aware of any actual or potential hazards to humans, animal life or the**  
26 **environment posed by the Project?**

27  
28 A. No

29  
30 **Q. Are there any state/federal/county laws/rules that require Basin Electric to have**  
31 **an Emergency Response Plan for this Project?**

32  
33 A. Yes; an Emergency Response Plan is required by Federal OSHA regulations. Also,  
34 because PGS Phases I & II require storage of anhydrous ammonia in excess of

1 10,000 pounds, EPA regulations require Basin Electric to have an Emergency  
2 Response Plan and collaborate with the Local Emergency Planning Committee.

3  
4 Q. **Does Basin Electric have an Emergency Response Plan in place for Pioneer  
5 Generation Station Phases I, II & III?**

6  
7 A. Yes.

8  
9 Q. **Please describe what the Emergency Response Plan entails.**

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11 A. The plan is to address the protection of life, health, safety, environmental and  
12 property during an emergency. The plan entails each emergency responder group  
13 along with contact information. It also identifies the response procedure based on the  
14 event. Basin Electric has established a comprehensive orientation, technical, safety,  
15 emergency and on the job training for its employees.

16  
17 Q. **What efforts has Basin Electric taken to make emergency responders aware of  
18 this Project?**

19  
20 A. On an annual basis, Basin Electric invites emergency responders, including first  
21 responders and local fire departments to the Project site for a tour and meeting to  
22 discuss how the facility operates and procedures should they called to respond to an  
23 emergency at the Project. Meetings were held in April 2013 and December 2014.

24  
25 Q. **I would now like to ask you a series of questions relating to the North Dakota  
26 Public Service Commission's Site Policy Criteria.**

27  
28 **What is Basin Electric's policy with respect to maximizing potential benefits  
29 through location, process and design of its facilities?**

30  
31 A. Basin Electric performs studies to identify facilities that are needed to ensure a  
32 reliable transmission and generation system. The location and output of these  
33 facilities is determined by planning experts to maximize the benefits of these projects.

1 Q. **What is Basin Electric's policy concerning the training and utilization of**  
2 **available labor in North Dakota for the general and specialized skills required?**

3  
4 A. Basin Electric has a long standing policy of recruiting and training workers from North  
5 Dakota. We have developed a partnership with Bismarck State College to provide  
6 the coursework for our apprenticeship programs in both our Transmission System  
7 Maintenance Division and power plant maintenance areas. We also work with the  
8 University of North Dakota, North Dakota State University, University of Mary,  
9 Bismarck State College and North Dakota State College of Science to fill internships  
10 and full time vocation/technical and professional positions. In addition, we recently  
11 established a "Grow Your Own Program" through Bismarck State College in which  
12 students who are enrolled in the power plant Technician Associate Degree program  
13 may apply and be selected for opportunities to work at our power plants as interns.  
14 Basin Electric hires up to five students at each of our power plants. As full-time  
15 positions become available, the students who have completed these internships may  
16 apply. If selected, Basin Electric will reimburse 50% of the cost of tuition and books  
17 (15% upon hire, 15% after completing one year of employment and 20% after  
18 completing two years of employment).

19  
20 Basin Electric staff members also sit on Advisory Boards for various programs at  
21 Bismarck State College.

22  
23 It is also Basin Electric's practice to hire qualified North Dakota workers. Basin  
24 Electric includes qualified North Dakota companies on its bidder lists for materials and  
25 construction work. The actual labor force used on our construction projects is hired  
26 by the contractors. The construction personnel are highly trained in this very  
27 specialized area of construction; however, certain portions of the construction  
28 sequence do not require specialized training. We anticipate that for these tasks, the  
29 contractor will likely employ local people.

30  
31 Q. **Will the Project make use of a primary energy source or raw material located**  
32 **within the state?**

33

1 A. Yes, natural gas utilized by this project comes from WBI Energy Transmission  
2 Stateline Pipeline. This pipeline transports processed oil field associated natural gas  
3 from OneOk's Stateline Natural Gas Processing Facility to the Northern Border  
4 Interstate Pipeline. While we're not certain where the natural gas comes from once in  
5 the pipeline, odds are a high percentage of the gas does come from North Dakota.

6

7 Q. **Will the Project require any relocation of residents?**

8

9 A. No

10

11 Q. **What efforts has Basin Electric made to economize the costs of construction  
12 and operation of this Project?**

13

14 A. Basin Electric has an obligation to its member cooperatives to construct facilities at  
15 the least cost while maintaining reliability and safety. By selecting the existing PGS  
16 site for this Project the cost of the necessary infrastructure and interconnections was  
17 avoided minimizing the Project cost.

18

19 In addition when possible, all materials and services will be competitively bid by  
20 qualified suppliers and Basin Electric will combine purchases with other projects to  
21 take advantage of volume pricing.

22

23 Basin Electric will share operations and maintenance personnel from other Basin  
24 Electric projects in the area including the Lonesome Creek Station located South of  
25 Williston and the Culbertson Generation Station in Montana minimizing operational  
26 cost.

27

28 Q. **How many full-time positions will be created by this Project?**

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30 A. Six full time operation technicians will be assigned to operate the PGS Phase III  
31 Project.

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33 Q. **Has Basin Electric involved local government entities and citizens in the  
34 planning process?**

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A. Basin Electric initiates and maintains close contact with all pertinent federal, state, and local agencies prior to construction of a facility. For this Project, we have met with county commissions, zoning boards, Township and city organizations. Mr. Miller will elaborate on this further.

**Q. Would you please tell the Commission what type of commitment Basin Electric has to North Dakota consumers regarding their electric power supply?**

A. Basin Electric is contractually committed to meet all of the additional power requirements, above their allocation from Western Area Power Administration, for the 14 North Dakota rural electric cooperatives that are our members.

**Q. Will a portion of the energy produced by this Project be used in this state?**

A. Yes

**Q. What is Basin Electric's policy regarding labor relations?**

A. Basin Electric management has always maintained an equitable, fair, and harmonious relationship with labor. Basin Electric uses both union and non-union contractors.

**Q. What is Basin Electric's policy and what efforts has the Cooperative made in the coordination of facilities?**

A. Basin Electric works closely with Western Area Power Administration, Montana Dakota Utilities, and our member systems to share facilities and avoid duplication. For the past five years, Basin Electric has been meeting with MDU, Western, and our members on a monthly basis to discuss western North Dakota transmission and generation issues.

**Q. What is Basin Electric's position on the monitoring of environmental impacts?**

1 A. Basin Electric's policy is that environmental impacts should be monitored and steps  
2 taken to mitigate and alleviate those impacts which have adverse effects. Once a  
3 power plant is commercial, a continuing program of maintenance begins. Basin  
4 Electric will monitor and correct any problems for the life of these facilities.

5

6 Q. **Mr. Rossow, based on your knowledge of the Project, do you believe the**  
7 **location, construction, and operation of the proposed Project produce minimal**  
8 **adverse effects on the environment and upon the welfare of the citizens of**  
9 **North Dakota?**

10

11 A. Yes

12

13 Q. **Is the proposed Project compatible with environmental preservation and the**  
14 **efficient use of resources?**

15

16 A. Yes

17

18 Q. **Will the proposed Project minimize adverse human and environmental impacts**  
19 **while ensuring continuing system reliability and integrity and ensuring that**  
20 **energy needs are met and fulfilled in an orderly and timely fashion?**

21

22 A. Yes

23

24 Q. **Does this complete your direct testimony?**

25

26 A. Yes.