



MONTANA-DAKOTA UTILITIES CO.

Before the Public Service Commission of North Dakota

Case Nos. PU-19-___ and PU-19-___

Direct Testimony
of
Alan L. Welte

1 **Q. Please state your name and business address.**

2 A. My name is Alan L. Welte and my business address is 400 North
3 Fourth Street, Bismarck, North Dakota 58501.

4 **Q. By whom are you employed and in what capacity?**

5 A. I am the Director of Generation in the power production department
6 of Montana-Dakota Utilities Co. (Montana-Dakota).

7 **Q. Please describe your duties and responsibilities with Montana-**
8 **Dakota.**

9 A. I have overall responsibility for the day-to-day operation of
10 Montana-Dakota's electric generation facilities, represent Montana-
11 Dakota's interests in jointly owned generation facilities operated by other
12 companies, and I am also responsible for new generation development.

13 **Q. Please outline your educational and professional background.**

14 A. I hold a Bachelor's Degree in Mechanical Engineering from North
15 Dakota State University. My work experience includes eight years of
16 experience as a plant engineer, twelve years of experience as a plant
17 manager, and fifteen years of generation development and operational

54 PU-19-307 Filed 04/27/2020 Pages: 6
Exhibit MDU-4 - Prefiled Testimony of Alan Welte
Montana-Dakota Utilities Co.

55 PU-19-317 Filed 04/27/2020 Pages: 6
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52 PU-19-306 Filed 04/27/2020 Pages: 6
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1 responsibilities in my current position which includes coal-fired, gas-fired,
2 and renewable generation.

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

4 A. The purpose of my testimony is to describe the Heskett 4
5 combustion turbine project (Project) identified as part of the Montana-
6 Dakota's 2019 least cost generation expansion plan. I will also discuss
7 the benefits in locating Heskett 4 on the existing Heskett 3 site, of
8 selecting similar major equipment to those used in Heskett Unit 3, and to
9 build Heskett 4 in conjunction with the retirement of the existing Heskett 1
10 and 2 coal-fired units.

11 **Q. Please describe Montana-Dakota's Heskett Unit 4 Project?**

12 A. The Project includes a simple cycle combustion turbine (SCCT) and
13 generator interconnected to Montana-Dakota's existing electric
14 transmission and natural gas systems. The Project will be located near
15 Mandan, North Dakota on Montana-Dakota's R.M. Heskett Station
16 property and on the existing Heskett 3 site. The timeline for construction
17 and commercial operation will be coordinated with the retirement of the
18 Heskett 1 and 2 coal-fired units to utilize the existing MISO transmission
19 system interconnection rights and to use the emissions reductions in the
20 air permitting for Heskett 4. Heskett 4 will be operated and maintained
21 with existing trained and experienced employees.

22 **Q. What is a SCCT electric generating facility?**

1 A. The purpose of a SCCT electric generating facility is to start up
2 quickly to serve peak capacity needs under higher electric market price
3 conditions or when there are transmission system reliability concerns. In
4 the SCCT, air is drawn in and is compressed using rows of rotating
5 blades. The compressed air is then sent to a combustion chamber where
6 it is mixed with fuel and the mixture is ignited. The hot combustion gas is
7 then expanded through rotating turbine blades delivering power through a
8 shaft connected to the generator where electricity is produced.

9 **Q. Please describe the major equipment that will comprise Montana-**
10 **Dakota's Project.**

11 A. The Project will include a nominal rated 88 MW heavy-duty frame
12 type combustion turbine and a totally enclosed water to air cooled
13 generator similar to those used in Heskett Unit 3. The SCCT will be
14 natural gas-fired, have a dry low NOx combustion system, and include
15 evaporative inlet air cooling for power augmentation. The generator will
16 connect to Montana-Dakota's 115kV transmission system through a
17 13.8kV to 115kV generator step up transformer. Station power will be
18 provided by a 13.8 kV to 4160 kV unit auxiliary transformer. Natural gas
19 equipment will include a pressure regulation station, a natural gas-fired
20 fuel gas heater and a final filtration skid. A closed cooling water system
21 will be included for cooling the turbine and generator lubricating oil, the
22 generator windings, and other smaller turbine support systems. A

1 continuous emissions monitoring system will be installed to measure NOx,
2 CO and O₂.

3 **Q. What Heskett Unit 3 design considerations, facilities and equipment**
4 **are anticipated to be utilized for the Heskett Unit 4 Project?**

5 A. Heskett 4 will benefit from Heskett 3 design considerations relating
6 to natural gas pipeline capacity and site layout. The existing natural gas
7 pipeline has enough capacity and will not require any additional pipeline
8 equipment to serve Heskett 4. The existing site, including the natural gas
9 yard and the construction parking and lay down area, were laid out to
10 accommodate the new Heskett 4 equipment. Additionally, Heskett 4 will
11 share the existing Heskett 3 fire protection loop, the storm water and
12 waste water systems, the oily drains tank, and the turbine water wash
13 system. Portions of the Heskett 3 service building, the underground
14 electric conduit, the control system, and spare parts will also be utilized for
15 Heskett 4. Exhibit No. __ (ALW-1) depicts a conceptual arrangement of
16 Heskett 4 on the existing site.

17 **Q. What potential savings and benefits can be realized by building the**
18 **Project at the Heskett site over a greenfield location?**

19 A. The full savings to be realized from site design considerations and
20 shared equipment are not available at this point in the preliminary design.
21 Three substantial cost savings that are anticipated relate to MISO
22 transmission system network upgrades, the electric transmission
23 interconnection, and the natural gas interconnection. If a greenfield

1 location required 15 miles of additional electric transmission and five miles
2 of additional natural gas pipeline, the added cost would be around \$14.5
3 million and \$7.4 million respectively. Assuming an average cost of
4 approximately \$113 per kW required for MISO transmission system
5 network upgrades for new generator interconnections in MISO's West
6 region, the savings realized by utilizing the existing Heskett 1 and 2
7 transmission interconnection rights through the MISO Generator
8 Replacement process would be \$11.0 million. Additionally, there are also
9 benefits to be achieved by netting the emission reductions from Heskett 1
10 and 2 against the Heskett 4 emissions in the air permitting process.

11 **Q. Please provide the estimated Project capital cost.**

12 A. The Heskett 4 Project capital cost is estimated to be \$73.0 million.
13 North Dakota's allocated share is approximately \$52 million.

14 **Q. Please describe Montana-Dakota's Project contracting approach.**

15 A. Montana-Dakota intends to hire an engineering consultant to
16 perform the detailed design, assist with the procurement process from bid
17 phase through administration of contracts after award, and manage on-
18 site construction, commissioning, and startup activities for Heskett 4. This
19 contracting approach is commonly referred to as an Engineer,
20 procurement support, and Construction Management (EpCM) contracting
21 approach, and is very similar to the multiple contracts approach used for
22 Heskett 3. Montana-Dakota expects that there will be at least seven major
23 equipment contracts, one or more major construction contracts, and

1 several smaller contracts for specialized equipment, construction, and
2 services for Heskett 4. Major contracts for equipment, construction, and
3 services will be directly between Montana-Dakota and the associated
4 vendor.

5 **Q. Please describe the Project activities undertaken at the time of the**
6 **Advance Determination of Prudence filing.**

7 A. Project activities include preliminary design and cost estimate
8 development, review of proposals for the air permit consultant, and filing of
9 the MISO Generator Replacement Process application.

10 **Q. What is the schedule for ceasing operation of Heskett Units 1 and 2?**

11 A. It is anticipated Heskett 1 and 2 operation will cease around March
12 31, 2022, following the end of the term of the existing coal supply
13 agreement and the cold winter months.

14 **Q. What is the anticipated schedule for commercial operation of the**
15 **SCCT?**

16 A. Project permit work began in 2019. Detailed engineering work is
17 anticipated to begin in January of 2021 and construction in March of 2022.
18 The unit is projected to be available for commercial operation in February
19 of 2023.

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

21 A. Yes, it does.