

Before the Public Service Commission of North Dakota

Case Nos. PU-14-____

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"), a Division of MDU
7 Resources Group, Inc.

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

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

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

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

1 manager, and nine years of generation development and operational
2 responsibilities in my current position which includes coal-fired, gas-fired,
3 and renewable generation.

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

5 A. The purpose of my testimony is to describe the Heskett III
6 combustion turbine project ("Project") and to provide an update on the
7 Project construction activities, schedule and cost estimate.

8 **Q. Please describe Montana-Dakota's Heskett III Project.**

9 A. The Project includes a natural gas-fired, 88 MW, simple cycle
10 combustion turbine ("Combustion Turbine") and the facilities to
11 interconnect with Montana-Dakota's existing electric system
12 ("Interconnect"). The Project is located near Mandan, North Dakota
13 adjacent to Montana-Dakota's R.M. Heskett Station. The Project also
14 includes a 10-inch natural gas pipeline ("Pipeline"), approximately 24 miles
15 in length, interconnecting with the Northern Border Pipeline Company near
16 St. Anthony, North Dakota to supply the natural gas requirements for the
17 Combustion Turbine. The Heskett III Project will be integrated into the
18 Heskett Station operations.

19 **Q. What is a simple cycle combustion turbine?**

20 A. Simple cycle combustion turbines ("SCCT") are generally built to
21 start up quickly to serve peak capacity needs. They usually supply a
22 limited amount of energy because they are fueled by natural gas or liquid
23 fuels which results in a higher fuel cost than with coal base load

1 generation facilities. In the SCCT, air is drawn in at the front of the unit
2 and is compressed using rows of rotating blades. The compressed air is
3 then sent to a combustion chamber where it is mixed with fuel and the
4 mixture is ignited. The hot combustion gas is then expanded through
5 rotating turbine blades delivering power through a shaft connected to the
6 generator where electricity is produced.

7 **Q. Please describe the Combustion Turbine equipment chosen for**
8 **Montana-Dakota's Project.**

9 A. The equipment includes a General Electric PG7121 ("7EA") heavy
10 duty ("Frame") combustion turbine which is natural gas-fired, has a dry low
11 NOx combustion system, evaporative inlet air cooling for power
12 augmentation, a totally enclosed water-to-air cooled (TEWAC) generator,
13 and a closed cooling water system for cooling the generator heat
14 exchangers, turbine supports, flame detectors, and lubrication oil. Other
15 auxiliary equipment includes natural gas heating and filtration, fire
16 detection and suppression, turbine water wash, turbine and balance-of-
17 plant control systems, starting means, exhaust system, a continuous
18 emissions monitoring system, as well as a service building, a high-voltage
19 substation, transformers, power load center and distribution equipment.
20 The Frame Combustion Turbine was selected due to its lower capital cost,
21 lower operation and maintenance cost, better emissions control, ability to
22 perform on-site maintenance, lower natural gas inlet pressure
23 requirement, less susceptibility to cold weather operational issues, and

1 Montana-Dakota's operating experience associated with the Frame
2 SCCTs.

3 **Q. Please describe the status of the Combustion Turbine construction**
4 **activities.**

5 A. The site preparation, service building, foundations and underground
6 construction commenced on April 29, 2013, and were substantially
7 completed on November 15, 2013. The mechanical and electrical ("M/E")
8 construction activities commenced on August 19, 2013, and are well
9 underway with approximately 70 percent of the work completed. The
10 mechanical portion of the M/E activities include heavy haul and setting the
11 turbine and generator, receiving and handling all other equipment and
12 materials, erection of all above ground mechanical equipment and piping,
13 as well as modification and tie-ins to existing Heskett Station systems.
14 The electrical portion of the M/E activities include the installation of all
15 above ground electrical equipment, enclosures, fixtures, and panels; as
16 well as grounding, cabling, and wiring of all equipment. All of the Project
17 equipment except for the continuous emissions monitoring system building
18 has been installed; piping and wiring activities are in progress. The on-
19 site construction was suspended for a winter break beginning December
20 20, 2013. Contractors will resume construction in March of 2014 following
21 the cold weather.

22 **Q. Please describe the status of the Pipeline construction activities.**

1 A. Construction of the natural gas Pipeline commenced on September
2 9, 2013, and progressed very well up to the scheduled suspension of
3 construction activities due to cold weather in early December of 2013.
4 The installation of the pipeline from the interconnect to the Heskett III site
5 is complete. Remaining construction of the facilities including pressure
6 regulation, metering, filtering, and natural gas heating equipment at the
7 interconnection and at the Heskett III sites, as well as clean-up, pressure
8 testing, and commissioning activities will resume in March of 2014
9 following the cold weather.

10 **Q. Please describe the status of the electric transmission Interconnect**
11 **construction activities.**

12 A. All of the Interconnect equipment and the transmission line
13 installation were completed by November 22, 2013. Remaining activities
14 include substation wiring, checkout, and protective relay configuration.

15 **Q. Please provide a breakdown of the original Project capital cost**
16 **estimate identified in the advance determination of prudence (ADP).**

17 A. The original capital cost estimate before adding allowance for funds
18 used during construction ("AFUDC") was \$75.0 million. Of the total, the
19 Combustion Turbine cost was estimated at \$54.4 million, the transmission
20 Interconnection cost was estimated at \$2.2 million, and the natural gas
21 Pipeline was estimated at \$18.4 million. The total estimated project cost
22 including AFUDC was \$85.6 million.

1 **Q. Please provide the current breakdown of the Project capital cost**
2 **estimate.**

3 A. The current capital cost estimate before adding AFUDC is \$71.7
4 million. Of the total, the Combustion Turbine cost is estimated at \$50.4
5 million, the transmission Interconnection cost is estimated at \$1.2 million,
6 and the natural gas Pipeline is estimated at \$20.1 million. The current
7 total project cost estimate including AFUDC is \$76.1 million.

8 **Q. Please explain the difference between the current and original**
9 **Project capital cost estimates.**

10 A. The reduction in the Project capital cost estimate of \$9.5 million is
11 the result of several factors. The majority of the contracted costs for
12 equipment came in at or below the original estimates, the Project
13 contingencies have been reduced as the procurement and construction
14 contracts have been executed and the costs have become more certain,
15 and a shortening of the construction schedule has reduced the estimated
16 AFUDC amount. These reductions have been partially offset by an
17 increase in the natural gas Pipeline cost estimate. The Pipeline costs are
18 projected to exceed the original estimate by about \$1.7 million primarily
19 due to challenges with the route terrain and the unusually wet weather
20 encountered during the fall of 2013.

21 **Q. What is the anticipated schedule for commercial operation of the**
22 **Project?**

1 A. The Project is anticipated to be ready for commercial operation
2 approximately July 1, 2014.

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

4 A. Yes, it does.