Deseret
Generation & Transmission Co-operative
Bonanza Power Plant
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AIR PROGRAM
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Mr. Larry Wapensky
US EPA, Region 8,
8P-AR
999 18th Street, Suite 500
Denver, CO 80202-2466

Re: Bonanza Unit PSD, Equipment System Descriptions.

Larry,

During our recent meeting you requested equipment and system descriptions on the Absorber, Baghouse, and reliability issues surrounding our Turbine. I have written a brief summary of all three below and attached are technical documents outlining the details of each system or issue.

Absorber Modules:
The Bonanza Power plant has three (50% capacity) identical, vertical, countercurrent absorber modules. Absorber Modules 1-1 and 1-3 normally operate at full load conditions while 1-2 is maintained in standby. Any combination of two towers can operate at full load if maintenance conditions affect the normal sequence.

Each Module consists of a large tower in which is installed a three-level slurry spray system, a bulk entrainment separator and mist eliminator vanes for water droplet removal. A mist eliminator cleaning system is used to clean the vanes. The base and lower portion of the tower is the slurry reaction tank.

The slurry reaction tank stores the limestone slurry for recirculation to the spray nozzles in the tower, and provides a liquid holding tank. This promotes the completion of chemical reactions changing the sulfates absorbed by the slurry to insoluble calcium solids.

Baghouse:
The Baghouse system is designed to remove the entrained fly ash from the flue gas. The Baghouse system is divided into two separate Baghouses; each consists of twelve compartments. Baghouse 1-1 and 1-2 are on separate duct fan trains. Each Baghouse compartment contains 450, 12" diameter, 37' long bags for a total of 10,800 bags in the system.

Ash removal is accomplished by passing the flue gas through the glass fabric bags where the ash is filtered by the fabric and trapped inside the bag. At a preset DP the compartment is removed from the gas stream and the bags are collapsed via a reverse gas stream. The collapsed bags release the trapped ash and it falls into a hopper below the compartment. From the hopper the ash is transported to a silo where it is mixed with the bottom ash and scrubber waste streams for landfill.

Turbine, Ruggedized rotor:
The Bonanza Power plant was constructed with a Westinghouse Turbine Generator. The unit consists of a High pressure/Intermediate pressure (HP/IP) rotor and a Low-pressure (LP) rotor. During the 1980's several power plants began to incur problems with the blading connections on the LP rotor. The blade root connections would develop cracks and in some cases catastrophic failures would occur.

Westinghouse developed procedures to monitor the root cracking and recommended blade replacements when cracking was found. Each time an affected Turbine was brought off line extensive and expensive testing is required to test each blade for cracking. Furthermore, even with testing at each outage blade failure could not be eliminated, thus affecting the reliability of the unit. As the unit operation hours increase so does the possibility of failure.

Based on these problems Westinghouse and the other major Turbine manufacturers developed "Rugged" technology. Through the advent of three-dimensional flow modeling and a redesign of the blade root, the new blades are more efficient and cracking problems have been potentially eliminated. The majority of Westinghouse Turbines, which are the same design as Bonanza, have modified their blade systems and rotors.

These issues are the basis for Deseret's decision to replace the Turbine rotors.

I hope these summaries and the attached information provide the background you need. If you have any further questions please do not hesitate to contact me at 435.781.5704 or mgoddard@deseretgt.com.

Michael D. Goddard
Senior System Engineer

Cc: Gordon w/o attachments
Vickers w/o attachments
Crabtree w/o attachments