San Juan Generating Station
Air Quality Control Systems

Project Case History

Public Service Company of New Mexico
Waterflow, New Mexico

Contract Order
2006 (Units 3 & 4)
2007 (Units 1 & 2)

Commercial Operation
2007 for Unit 4
2008 for Units 1 & 3
2009 for Unit 2

Babcock & Wilcox (B&W) provides cost-effective control of particulate emissions and opacity with our proven pulse jet and reverse air fabric filter technologies. We have provided some of the largest fabric filters in the world. Innovative design features such as long bag technology, integral gas and dust distribution devices, as well as on-line maintenance capability provide benefits of increased reliability while achieving lower emissions.

Boiler/Plant Information
Unit 1 – 360 MW
Unit 2 – 350 MW
Unit 3 – 544 MW
Unit 4 – 544 MW

Boiler Type: Pulverized coal
Design Fuel: Western bituminous

Project Summary
The project involved the design and installation of environmental upgrades for the San Juan Generating Station including new low nitrogen oxides (NO_x) burners with overfire air (OFA) to reduce NO_x formation in the boilers, the addition of powdered activated carbon (PAC) injection to reduce mercury emissions, coupled with new pulse jet fabric filters for enhanced control of particulate

emissions. A chemical additive system to improve sulfur dioxide (SO_2) removal for the wet flue gas desulfurization absorbers was also included in the project scope.

B&W Scope
- Engineering, procurement, construction (EPC) and commissioning of the systems and equipment listed below
- Construction provided by Babcock & Wilcox Construction Co., Inc., a B&W subsidiary
- Replacement of existing burners with new DRB-4Z® low NO_x burners for Units 1, 2, 3 & 4
- Addition of overfire air to Units 1, 2, 3 & 4
- Upgrades and additions to the auxiliary equipment/controls for the burner replacement
- Addition of new PAC injection systems including silos, metering/feed equipment and injection lances (one for each boiler for a total of four systems)
- Two new 10-compartment pulse jet fabric filters (one for Unit 3 and one for Unit 4), each with control systems and modifications to existing flues
- Two new 8-compartment pulse jet fabric filters (one for Unit 1 and one for Unit 2), each with control systems and modifications to existing flues
- Modifications and additions to the existing ash removal system to incorporate the new fabric filters while maintaining the capability of handling ash from the de-activated "hot" electrostatic precipitators
- Installation of a chemical additive system to meter dibasic acid into the limestone slurry for the wet flue gas desulfurization system
- Installation of boiler and flue stiffening on all four units
- Upgrades to booster fans and motors on all four units

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Additional B&W Services

- Flow model studies using physical models for the flue work and fabric filter designs for Units 1, 2, 3 & 4
- To compensate for limited site access, fabric filter compartments and flues were first modularized on fabrication tables before being erected
- Pressure part boiler projects completed during tie-in outages:
  - Unit 1 – Replaced upper and lower economizer
  - Unit 2 – Replaced upper and lower economizer, horizontal reheater, reheat outlet header, and rear waterwall panels
  - Unit 3 – Replaced horizontal primary superheater and economizer
  - Unit 4 – Replaced horizontal primary superheater

Results

- In 2009, a major upgrade to the San Juan Generating Station boilers and air quality control system was completed. The total project required three years to complete. The project goals to reduce NO_x, mercury, particulate and SO_2 emissions from the coal-fired boilers were accomplished.
- All work was completed within milestone dates of the contracts
- The project was executed using a teaming arrangement between B&W and PNM to proactively address issues, reduce costs and share in resources.
- B&W had previously converted the existing wet flue gas desulfurization (FGD) scrubbers on San Juan Units 1 through 4 to a limestone forced oxidation system. The three-year project (1997 to 1999) reused much of the existing equipment at the plant, resulted in more efficient and effective SO_2 removal, and also utilized a unique teaming arrangement to reduce project costs.

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