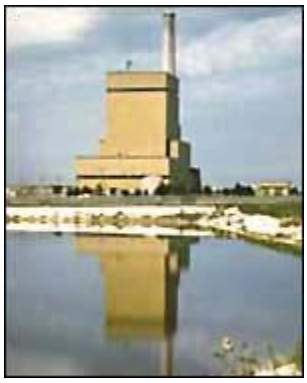
99.99% Clean....

DOE Signs Agreement to Install Advanced Pollution Control Device on S. Dakota Power Plant

Leading-Edge System Virtually Eliminates Emissions of Microscopic Ash Particles

Milbank, SD - By this fall South Dakota will likely host one of the world's cleanest coal plants in terms of the tiny specks of fly ash emitted from its smokestack.



South Dakota's Big Stone Plant will soon get an environmental upgrade that will virtually eliminate particulate emissions.
Photo: Otter Tail Power Co.

A cooperative agreement signed between the U.S. Department of Energy and the Otter Tail Power Company paves the way for installation of a new type of pollution control device on the 450-megawatt Big Stone Power Plant in Milbank, South Dakota.

When it begins operating this fall, the first-of-a-kind device is expected to remove more than 99.99 percent of the microscopic particulate matter released when coal burns – virtually eliminating a pollutant that contributes to haze and can cause respiratory problems.

If the device works as planned, the 27-year old Big Stone Power Plant will reduce emissions of airborne particles to less than *seven one-thousandths* of a pound per million British Thermal Unit – or 0.007 pounds per million Btu – more than four times cleaner than required by current clean air laws. (Clean air standards for the region limit particulate emissions to no more than *three one-hundredths* of a pound per million Btu – or 0.03 pounds per million Btu.)

The $13.4 million project is one of eight the Energy Department selected last October in a program called the "Power Plant Improvement Initiative." (One of the original projects has subsequently dropped out of the program.)

The Otter Tail project is the first to have completed negotiations with the government and received approval to proceed. The Department will finance $6.5 million of the project's total cost. The Otter Tail Power Company, headquartered in Fergus Falls, Minn., and W. L. Gore & Associates, of Newark, Del., will fund the balance.

The Power Plant Improvement Initiative was carried out in 2001 in the aftermath of a series of brownouts and blackouts that plagued major regions of the country.

With coal accounting for more than half the nation's electricity, the initiative targeted new technologies that could help coal plants improve their environmental performance, boost their output, and avoid premature shutdowns that could worsen the nation's power problems.

The demonstration of the highly-efficient particulate collector comes at a time when the Environmental Protection Agency (EPA) is re-evaluating air quality standards for particulate matter. The EPA is to decide later this year if regulations should be tightened or otherwise modified. If more restrictive standards are imposed, demand for super-clean pollution control systems like the one to be demonstrated at the Big Stone power plant could increase significantly.

The new technology will be a hybrid system, combining the best features of baghouses and electrostatic precipitators, the two most common devices used today to reduce particulate emissions from power plants.

Baghouses are essentially huge vacuum cleaners that use a series of fabric filters to trap particles in the combustion gases emitted from coal boilers. Electrostatic precipitators rely on a series of plates and electrodes to create an electric field that charges particles in the gas stream. Just as static electricity causes objects to cling together, the charged dust particles cling to the plates.

The "advanced hybrid particulate collector" being readied for the Big Stone plant improves both the baghouse and electrostatic precipitator concepts. Metal plates running the length of the collector contain numerous circular openings. In between the plates are metal rods that emit an electrical charge. Behind the plates are filter bags made of Gore-Tex®, the durable fabric more known for its use in outdoor wear.

When flue gas from the coal boiler enters the device, more than 90 percent of the tiny fly ash particles become electrically charged and adhere to the plates much like an electrostatic precipitator.

Particles eluding the plates flow through the openings and are trapped by the filter bags, which are especially efficient at removing extremely small particles.

Internal view of the Advanced Hybrid Particulate Collector showing the Gore fabric filter bags, electrodes, and collecting plates.

The device is not only highly effective but also only one-third the size of a standard electrostatic precipitator, making it suitable for space-limited power plants. It was developed at the Energy & Environmental Research Center at the University of North Dakota under a research program administered by the Energy Department's National Energy Technology Laboratory.

W.L. Gore & Associates is licensed to market the technology to the utility industry and plans to sell it under the name "Advanced Hybrid™ Filter." Under the government's cost-sharing agreement, data on the advanced technology will be collected over the next two years. After that the system will continue to operate as a permanent part of the Big Stone Power Plant.

– End of *Techline* –

For more information:
General Inquiries: David J. Anna, DOE National Energy Technology Laboratory, 412/386-4646, e-mail: david.anna@netl.doe.gov

Technical Inquiries: John M. Rockey, DOE National Energy Technology Laboratory, 304/285-4711, e-mail: john.rockey@netl.doe.gov