

CLIFFSIDE STEAM STATION MODERNIZATION



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UNIT 6

- Hitachi supercritical boiler, Toshiba steam turbine generator and Alstom flue gas cleaning
- Project is \$1.8 billion, without financing, and will be operational in summer 2012
- Awarded \$125 million Advanced Coal Project Tax Credit by U.S. Department of Energy
- First coal unit to include carbon mitigation plan in air permit

EMISSIONS REMOVAL DESIGN FEATURES

- Selective catalytic reduction (SCR) reduces NOx by 90 percent
- Fabric filter baghouse reduces fly ash emissions by 99.9 percent
- Wet flue gas scrubber removes 99 percent of SO₂ and 90 percent of mercury
- Spray dryer absorber and baghouse remove acid gases and particulates
- The innovative use of proven technologies enables the unit to be classified as a minor source emitter of hazardous air pollutants (HAPs)

PROJECT CONSTRUCTION COMMODITIES

- 1.8 million cubic yards of earth excavated
- 291,000 linear feet of piping
- 80,000 cubic yards of concrete
- 35 million pounds of structural steel
- 6 million linear feet of power and control cable
- The modernized Cliffside facility will emit 80 percent less SO₂, 50 percent less NOx and 50 percent less mercury than the five existing Cliffside units, while generating more than twice the electricity.



This artist's rendition features the major components of the clean, high-efficiency Cliffside Unit 6.

- 1** The Unit 6 cooling towers require significantly less water to cool the steam produced in the boiler.
- 2** The turbine building is 124 feet tall and contains the Unit 6 turbine and generator. The unit will be capable of producing 825 megawatts of electricity.
- 3** The boiler building is 270 feet tall and contains thousands of tubes filled with water that is heated to steam by burning coal in the boiler at supercritical temperatures (1075 °F).
- 4** Unit 6 will have a state-of-the-art emissions control system designed to reduce SO₂ by 99 percent, NOx by 90 percent and mercury by 90 percent.
- 5** A flue gas desulfurization system (scrubber) will be used to remove almost all of the SO₂ produced. The limestone,

piled near the unit, is mixed with water and absorbs the SO₂, creating gypsum, which can be sold for use in wallboard manufacturing.

- 6** The artist's rendition shows the coal that will supply Cliffside Units 5 and 6. Duke Energy projects that the two units will consume more than 4 million tons of coal a year.
- 7** Cliffside Unit 6 will be an advanced, state-of-the-art, highly efficient, reliable coal-fired unit. The Unit 5 and 6 flues will share a common stack. The emissions control system will produce a white plume of mostly water vapor. Duke Energy will retire the older, less efficient Cliffside Units 1-4 before Unit 6 begins to generate electricity as part of its fleet modernization program.

FEATURES AND BENEFITS

- 1** The Unit 6 cooling towers require significantly less water from the Broad River to cool the steam produced in the boiler.
 - 2** The turbine building is 124 feet tall and contains the Unit 6 turbine and generator. The unit will be capable of producing 825 megawatts of electricity.
 - 3** The boiler building is 270 feet tall and the boiler contains thousands of tubes filled with water heated to supercritical temperatures (1075°F) by burning coal. Unit 6 will have a state-of-the-art emissions control system designed to reduce SO₂ by 99 percent, NO_x by 90 percent and mercury by 90 percent.
 - 4** A wet flue gas desulfurization system (wet scrubber) will be used to remove almost all of the SO₂ produced. The wet scrubber uses limestone mixed with water to absorb SO₂ and create gypsum, which may be sold for use in wallboard manufacturing.
 - 5** Cliffside Unit 6 will be an advanced, state-of-the-art, highly efficient, reliable coal-fired unit. Unit 5 and 6 flues will share a common stack, where a white water vapor plume will be visible.
 - 6** The project was designed to reuse and recycle water where practical. The design reduces the amount of water withdrawn from the river and reduces the amount of wastewater that needs to be cleaned and released.
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