

Mercury Specie and Multi-Pollutant Control

Participant

Pegasus Technologies (a division of NeuCo, Inc.)

Additional Team Members

NRG Texas, LLC — collaborator and host

Location

Jewett, Leon County, TX (NRG Texas Limestone Plant)

Technology

Pegasus Technologies’ sensors and neural network-based optimization and control system for enhanced mercury and multi-pollutant control

Project Capacity/ Production

890 MW (gross); 14,500 tons of coal/day input

Coal

Texas lignite and Powder River Basin subbituminous

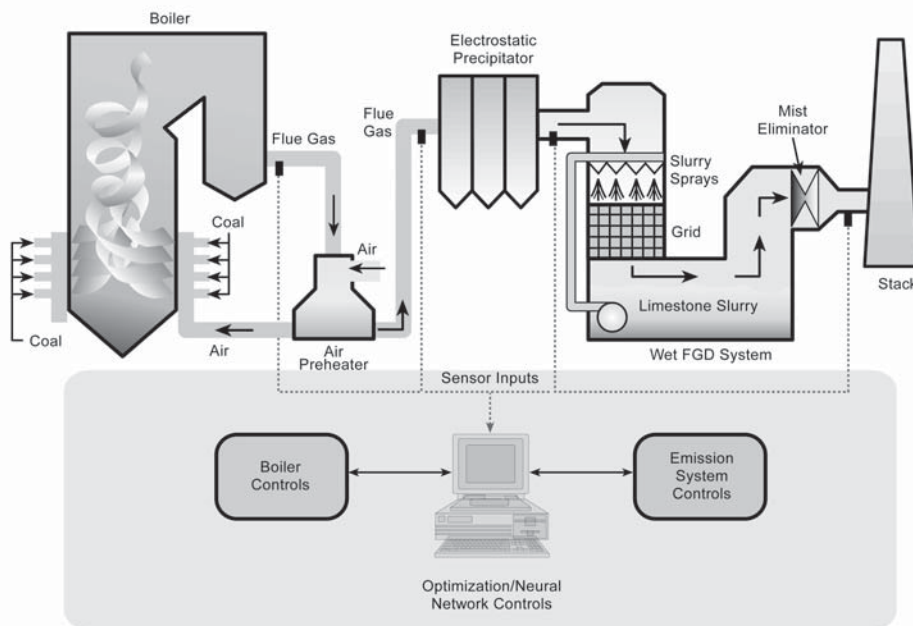
Project Funding

Total	\$15,560,811	100%
DOE	6,079,479	39
Participant	9,481,332	61

CCPI-2

Emissions Control

Mercury	■	NO _x	□
SO ₂	□	PM _{2.5}	□



Objectives

To demonstrate that state-of-the-art sensors and neural network-based optimization and controls can measure and effect mercury species, control mercury emissions with existing flue gas desulfurization (FGD) and electrostatic precipitator (ESP) systems, and reduce pollutant emissions in general without major capital expenditure.

Technology/Project Description

The project will demonstrate non-intrusive advanced sensors and neural network-based optimization and control technologies for enhanced mercury and multi-pollutant control on an 890-MW tangentially fired boiler at the NRG Texas Limestone Plant in Jewett, Texas. The plant is equipped with both a cold-side ESP rated at 99.8 percent particulate removal efficiency, and a wet limestone FGD system rated at 90 percent sulfur dioxide (SO₂) removal efficiency. Both the ESP and wet FGD system are capable of high mercury capture efficiency if the mercury is in an oxidized solid state rather than elemental vapor state. The plant burns a blend of Texas lignite and Powder River Basin subbituminous coal, which are known to emit relatively high levels of elemental mercury under routine combustion conditions. Pegasus Technologies will apply sensors to evaluate the mercury species (elemental and oxidized mercury) at key locations, develop optimization software that results in the best plant conditions to promote mercury oxidation and minimize emissions in general, and use neural networks to effect the optimization conditions.

Project Duration 49 Months	Period of Operation 19 Months	Status/Schedule *Estimated date
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Benefits

The technology affords plant operators the means to assess how plant operating parameters affect mercury species determination, and the capture efficiency of existing FGD and ESP systems; translate the data into optimization software that provides the lowest possible pollutant emissions; and effect optimization through neural networks. The technology allows operators to maximize emissions control with existing pollutant control systems. This capability reduces risk of non-compliance with minimal capital expenditure. The technology should have broad application to the existing fleet of coal-fired boilers and have minimal impacts on the quality of salable by-products, such as fly ash.

Status/Accomplishments

The Categorical Exclusion (CX) for the project was signed in March 2005, and the Cooperative Agreement (CA) was signed in April 2006. Installation of key process components is under way.

S T A T U S	R e p o r t	<i>Final Report Issued</i>	<i>11/10*</i>
		<i>Draft Report Issued</i>	<i>8/10*</i>
		<i>Operation Completed</i>	<i>5/10*</i>
	O p e r a t i o n		
		<i>Operation</i>	<i>10/08*</i>
	C o n s t r u c t i o n		
		<i>Construction</i>	<i>6/07*</i>
	D e s i g n		
		<i>Award</i>	<i>4/06</i>
	P r e A w a r d	<i>NEPA Completed (CX)</i>	<i>3/05</i>
	<i>Selection</i>	<i>10/04</i>	

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