

Technology. Guided by an advisory committee made up of more than 50 industrial participants, ASPEN became one of the most flexible and powerful computer software programs for the chemical and energy industry. Developers of the model founded AspenTech in 1981 to commercialize the technology. AspenTech has since evolved into a fast growing, high-tech company with nearly \$58 million in annual sales. The company now has more than 450 commercial customers for the process simulation model, including 42 of the 50 largest chemical companies in the world.

Neutralizing NOx with Neural Networks

Minimizing the formation of nitrogen oxides - or NOx - in a coal-fired boiler often requires rapid and precise adjustments to the firing conditions of scores of individual burners in a typical boiler. Digital control systems for power plants have been a major advance in "fine-tuning" these burners.

Now, because of a collaborative effort between DOE, Southern Company Services, the Electric Power Research Institute, and others, a neural network, a type of artificial intelligence software program, has been developed to greatly improve digital controls of the burners.

Called the Generic NOx Control Intelligent System (GNOCIS), the neural network models the combustion characteristics of a boiler and makes continuous adjustments to the firing conditions to lower NOx emissions while enhancing boiler efficiency. Testing of GNOCIS at Southern Company Service's Gaston station showed NOx reductions of 15 percent and combustion efficiency improvements near 0.5 percent. Because of the successful tests at Gaston and at the United Kingdom's Kingsnorth stations, GNOCIS will be installed at 21 U.S. sites this year.