

## **ABSTRACT**

### **Evaluation of Retrofitted Post Combustion NO<sub>x</sub> Control Technologies on a Wet Bottom, Coal-Fired Utility Boiler**

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Public Service Electric and Gas (PSE&G) has evaluated the effectiveness of post-combustion NO<sub>x</sub> control technologies on a wet-bottomed, coal-fired boiler. The technologies under study were conventional urea-based SNCR, horizontal In-Duct™ and air heater SCR, and a combination of SNCR and SCR designated as SNCR/SCR Hybrid. While SNCR and, to a limited extent, SCR have been used on coal-fired boilers, these processes had not been demonstrated on a unit with the same configuration as the wet-bottom, split furnace design (independent superheat and reheat furnaces) continuous slagging, 321 MW pulverized coal electric boilers operated at PSE&G's Mercer Generating Station.

In 1993, PSE&G, in partnership with EPRI, conducted a three month demonstration of urea based SNCR on one half of Mercer Unit 2. Building on these results, in 1994, PSE&G installed plate-type catalyst in the horizontal ductwork between the economizer outlet and air heater inlet of Unit 2. Immediately following this In-Duct SCR evaluation, on SNCR/SCR Hybrid demonstration was performed.

To meet the near term May 31, 1995 NO<sub>x</sub> Ract Compliance date imposed by the state of New Jersey, a commercial SNCR system was installed on both Mercer Units Nos. 1 and 2.

This paper summarizes the results of the demonstration programs and comparisons to baseline NO<sub>x</sub>. Of particular interest was the relationship of each technology to operation of the unit. The ability to maintain low NO<sub>x</sub> emissions while varying loads and fuels, as well as determining ammonia slip and pressure drop was also demonstrated. Additionally, it discusses the success of commercial SNCR system in controlling NO<sub>x</sub> emissions with respect to reliability and longer term performance results. It also discusses the ability of the system to generate Discrete Emission Reduction credits (DER's), which are then used by PSE&G internally or sold to others as part of a NO<sub>x</sub> credit trading program. Finally, it discusses the effect of the SNCR operation on a long term reactivity of the SCR catalyst and the project of the ultimate life of the catalyst.