

Petroleum Refinery

CataStak™ SCR System Retrofit Simplifies Consent Decree Compliance

Since 2000 the Environmental Protection Agency (EPA) has entered into settlements with twenty-four U.S. companies representing nearly 88% of the nation's petroleum refining capacity. Once fully implemented, annual emission reductions will be more than 87,000 tons of nitrogen oxides (NOx).

One of the oldest refiners in the United States was included in the initiative. A consent decree was issued requiring three of its facilities (with a total production capacity of nearly 160,000 bpd) to reduce NOx air emissions by about 1,100 tpy through the installation of proven pollution control devices.

In response to the consent decree the 75,000 bpd plant planned to retrofit four (4) 177,000 lb/hr boilers, originally installed in 1948, with best available control technology (BACT). A solution that would not compromise burner operation, boiler performance, load response and turndown was required.

Nationwide Boiler's CataStak™ SCR system was selected to easily reduce NOx emissions from 270 ppm to less than 9 ppm NOx, resulting in a 97% NOx reduction.

As part of the project the customer removed old air pre-heaters and installed Nationwide Boiler's EconoStak economizers to reduce flue gas temperature and increase overall boiler thermal efficiency. Nationwide's solution also included DNX catalyst, reactor modules, skid-mounted ammonia delivery systems (for the dilution and vaporization of aqueous ammonia) and custom engineered 50 foot stacks (able to withstand wind loads of up to 125 miles per hour).



The multiple units were quickly installed and delivered by Nationwide Boiler within the quoted time-period and are currently in operation. Each unit was tested and exceeded the required NOx emission guarantees, performing at 3 ppm NOx and 2.5 NH₃ slip. In addition, installation of the new CataStak™ SCR system and EconoStak economizers provided boiler thermal efficiency gains of 2%, helping the customer to reduce fuel costs and increase efficiency.

Overall, Nationwide easily reduced NOx emissions for consent decree compliance, satisfied all the needs of the customer and was committed to fulfil every requirement of the project. The CataStak™ SCR system once again proved to be the preferred choice for reliable performance and emissions compliance.

Customer Profile

- Major oil refiner
- Northeast Oklahoma
- Total plant production capacity of 160,000 bpd

Supplied Equipment

- CataStak™ Selective Catalytic Reduction System
- Stack-mounted EconoStak economizer on existing 40,000 lb/hr boiler

