

## Petroleum Refining



### CataStak™ SCR System Retrofit Simplifies Consent Decree Compliance

#### Background

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

One of the oldest refiners in the United States was included in the initiative and 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 approximately 1,100 tpy through the installation of proven pollution control devices.

#### Problem

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

#### Summary

- Reduce NOx emissions with Nationwide's CataStak™ SCR system
- Retrofit of four (4) 177,000 lb/hr packaged boilers, originally installed in 1948

that would not compromise burner operation, boiler performance, load response and turndown was required.

#### Solution

Nationwide Environmental Solutions' 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'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' stacks (able to withstand wind loads of up to 125 mph).

#### Results

The multiple units were quickly installed and delivered by Nationwide 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 NH<sub>3</sub> slip. In addition, installation of the new CataStak SCR system and EconoStak economizers provided boiler thermal efficiency gains of 2%.

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

#### Equipment Used

- Four(4) CataStak Selective Catalytic Reduction systems for < 9ppm NOx
- Four (4) EconoStak Economizers
- Aqueous ammonia delivery system

**CataStak**<sup>TM</sup>  
Ultra Low NOx Solutions

