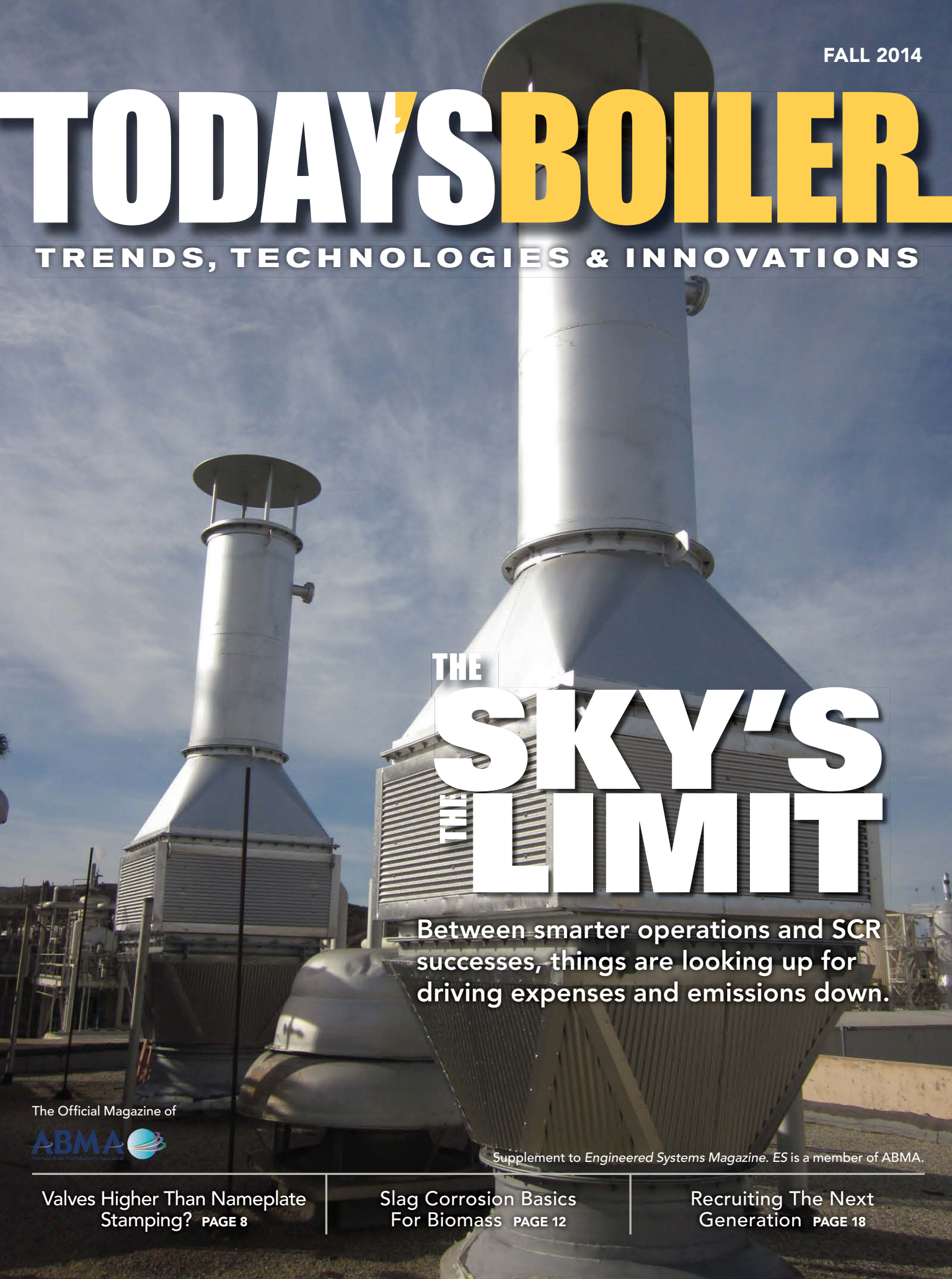
FALL 2014

TODAY'S BOILER

TRENDS, TECHNOLOGIES & INNOVATIONS



THE SKY'S THE LIMIT

Between smarter operations and SCR successes, things are looking up for driving expenses and emissions down.

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DETENTION CENTER KEEPS NOx IN WITH AMMONIA-FREE SCR SYSTEM

BY **DAVID SPAIN, P.E.**

Emission reduction projects in the media are highly focused on large industrial source emitters. Companies that fall in this category include refineries, petrochemical producers, pulp and paper mills, and major food and agricultural processors. Large-scale energy producers, predominately plants that operate coal-fired boilers and are regulated under Boiler MACT, are also highly publicized in mainstream America. Smaller commercial and institutional plants, known collectively as area source emitters, are less likely to be targeted in the national headlines. These types of facilities, however, face the same challenges in air pollution controls as their major emitter counter parts, specifically for NOx and CO emission reduction requirements. Collectively, they can make major impacts in the goal of reducing greenhouse gases and air pollution.

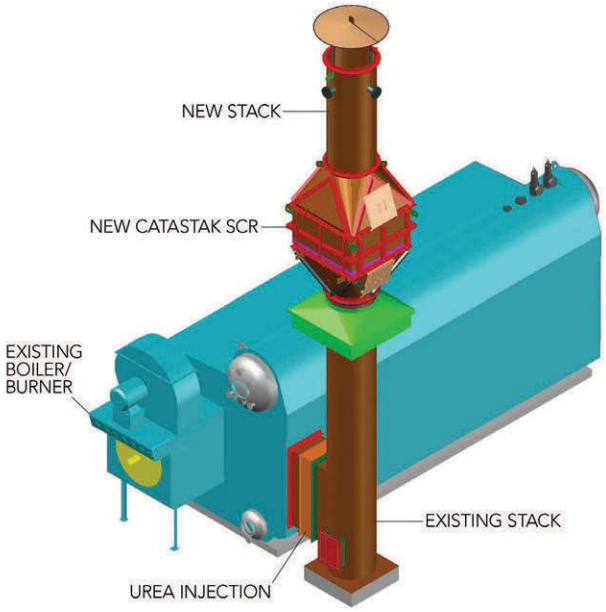
The Environmental Protection Agency (EPA) has estimated that there are 183,000 area source boilers compared to 14,000 major source boilers in the United States. Area sources include universities, hospitals, institutions, and commercial buildings. Similar to major source facilities, these facilities must also comply with stringent air requirements, and the potential to decrease emissions can be great.

The Peter J. Pitchess Detention Center (PDC, also known as the Wayside Jail), in Castaic, CA, (County of Los Angeles) is a prime example of a governmental, area source institution that was mandated by the South Coast Air Quality Management District (SCAQMD) to reduce two dual-fuel fired Keeler auxiliary boilers from NOx emission limits, on natural gas, of 30 ppmvd @ 3% O_2 to only 5 ppmvd @ 3% O_2. The facility specified a system that uses the safe and readily available urea product diesel exhaust fluid (DEF™), which eliminates the need for boiler operators to store and handle anhydrous ammonia.

Nationwide Boiler was selected to supply two Ammonia-Free CataStak™ SCR systems that utilized Combustion Components Associates (CCA) patented TRIM-NOX® LT urea injection systems. Nationwide Boiler contracted with California Boiler, Inc. for the installation of the SCR and the urea injection systems. The installation included removal of the top portion of each boiler's stack to facilitate the insertion of the SCR reactor housing, duct work, and support frames.

Overall, the SCR system easily reduced NOx emissions from 30 ppmvd @ 3% O_2 to actual source tested levels of 3 ppmvd @ 3% O_2 NOx, with ammonia slip under 2 ppmvd @ 3% O_2. The system also complied with Rule 1146 without concerns about meeting future NOx emission limits.

"Over the last several years air pollution requirements around the nation have become more and more strict, and Nationwide Boiler has seen a major shift in the demand for ammonia-free SCR systems for packaged boiler systems. Our alliance with CCA [CCA Combustion Systems, a division of Peerless Mfg. Co.] enables us to provide a



technologically advanced solution that, compared to traditional ammonia-free systems, is more cost-effective and has been proven as an energy-efficient alternative for all boiler operators," stated Larry Day, Executive Vice President of Nationwide Boiler.

"I believe that this SCR system will become the new standard for both major and area sources. It is a reliable solution that complies with the strictest NOx requirements mandated by local Air Quality Districts in the United States, and every installation has exceeded initial NOx guarantees and has met or surpassed minimal NH_3 slip requirements. In the long run, results like these will add up to significant positive effects to our environment and air quality."

Results similar to the PDC project are common. Nationwide Boiler's ammonia-free selective catalytic reduction (SCR) system eliminated the need to retrofit two boilers, operated by NRG San Francisco, with Ultra Low NOx (ULN) burners. This solution not only focused on green house gas reductions, but compared to ULN burner technology, SCR technology did not increase force draft fan horsepower electrical requirements or require the use of flue gas recirculation. It provided a higher, more efficient boiler operation. NRG's SCR system easily exceeded NOx requirements and reduced emissions from 30 ppmvd @ 3% O_2 to actual source tested levels of only 1 ppmvd @ 3% O_2 NOx throughout the entire firing range of the boiler. Comparable to the PDC project, the system remains to operate dependably without any performance issues or concerns about meeting future NOx emission limits.

Whether housing a major source or area source boiler, facilities located throughout the nation face similar goals, set forth by the EPA, regarding the improvement of air quality, safety, and concern for public health. Companies that design, manufacture, and supply boiler-related emissions-controls equipment will be called upon to provide products that meet the ever-changing compliance rules associated with air quality requirements specific to industrial and commercial users searching for clean, efficient, and fuel-flexible solutions. TB