

# BIC

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## ICT: EXPERTS IN TURNKEY COOLING TOWER SOLUTIONS

While working in the Gulf Coast's largest industrial facilities, ICT uses innovative construction methods for complete cooling tower replacements. Since 1958, ICT has provided engineering, procurement and construction services for the cooling tower industry.

## BILFINGER: ENSURING ASSET RELIABILITY

To ensure clear, consistent standards of quality, integrity and policies across the business, Bilfinger has implemented a total management system.

## FEATURES

Industry prepared to meet challenges of 2020 and beyond

LyondellBasell's Greg Gray: Safety, sustainability begin with trust

Concrete anchor issues during FRP cooling tower rebuilds

Numerous factors contribute to turnaround planning and scope

Industry leaders look to coming years with cautious optimism

COVID-19's effect on workforce development

AFPM's industry tools help advance process safety

Chevron, Valero: Turnaround safety requires constant attention

Campo: Houston Ship Channel essential to U.S. economy, future

PLUS...



# ICT

INTERNATIONAL  
COOLING TOWER



## EXPERTS IN TURNKEY COOLING TOWER SOLUTIONS





# Selective catalytic reduction for temporary boiler applications

Emissions compliance procedures have been implemented for the well-being of our society. Because boilers are a combustion source, they have been regulated heavily in certain areas of the country for nearly 60 years. These protocols extend not only to permanent equipment, but also to boilers installed for temporary applications. Whether a temporary or permanent system, NO<sub>x</sub> compliance can be achieved in one of two ways: with ultra-low NO<sub>x</sub> burners or selective catalytic reduction (SCR).

Low-NO<sub>x</sub> burners were developed in the '90s to control the formation of thermal NO<sub>x</sub> through staged combustion and flue gas recirculation (FGR). Today, there are ultra-low NO<sub>x</sub> burners that can achieve sub-7 ppm NO<sub>x</sub>. However, there are some major drawbacks to utilizing these more advanced burners on larger boiler systems. With their high FGR and excess air rates, operational limits are compromised resulting in limited turndown capabilities, flame pulsations and unstable operation. In addition, they generally have a high carbon footprint due to increased electrical consumption and inefficient combustion.

One readily available and proven alternative to burner technology is SCR. SCR systems provide a compact, multipollutant emissions control solution that does not affect flame stability or boiler performance. Furthermore, systems have been installed that are performing at NO<sub>x</sub> emission levels as low as 1 ppm.

A typical SCR system consists of five major components: 1. an insulated reactor housing with inlet and outlet transitions, 2. modules or cassettes of low-temperature catalyst, 3. a reducing agent (reagent) control skid, 4. a reagent injection system and 5. a stack with EPA ports. As the mixture of ammonia and NO<sub>x</sub> in the flue gas contacts the catalyst, NO<sub>x</sub> is converted to inert nitrogen and water, reducing NO<sub>x</sub> emissions caused by fuel combustion, often by over 90 percent.

As an added benefit, SCR systems are not limited to one boiler type, one orientation or even one specific reagent. They can be customized in various ways to fit the unique needs of each temporary rental application.

• Boiler type: Both firetube and watertube boilers are great candidates for SCR

technology. However, in temporary applications, they are more commonly used with larger watertube boilers.

• SCR orientation: No two plants are the same, and when it comes to temporary installations, it can be difficult to determine the best location for installing the rental equipment. Is there enough footprint? Is it close enough to the utility tie-in points? These questions and more must be considered prior to taking delivery of the equipment.

Rental SCR systems offer the versatility needed to fit within the available space of each facility. There are currently SCR systems built specifically for the rental market in both vertical and horizontal orientations.

• Reagent options: With ammonia being the standard reagent utilized, a common misconception associated with SCR systems is that they are dangerous and difficult to handle. However, SCRs are designed for ease of handling and operation. In fact, end users have a choice between anhydrous ammonia, aqueous ammonia or urea as the reagent. Each reagent has its own benefits, and users can determine which is the best choice based

on their facility operations.

In the rental market today, you will often find firetube boilers with ultra-low NO<sub>x</sub> burners for emissions compliance. But for larger watertube applications, it is more likely to utilize a standard SCR system for as low as 2.5 ppm NO<sub>x</sub>. Some boiler rental companies even maintain an entire fleet of SCR systems specifically for use with package rental boilers.

All in all, SCR is by no means a new technology and has been proven to be effective in many temporary boiler applications. It provides several advantages over ultra-low NO<sub>x</sub> burners, including simpler and more reliable operation with little operator intervention required. In addition, SCR systems are customizable and can provide reduction for not just one, but multiple pollutants.

When deciding which technology is best for your application, be sure to choose one that can ensure emissions compliance without compromise.

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