

	<b>TNChE Asia 2023 Conference</b> <b>" Decarbonization of Process Industry and</b> <b>Next-Generation Materials for Sustainability "</b> <b>Presenter Bio Data &amp; Abstract</b>	
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**Title of Presentation** : A Novel Revamp Technology to Maximize Fired Heater Capacity and Run-Length while Cutting CO<sub>2</sub> and NO<sub>x</sub> Emissions



**Presentation Abstract :**

To meet current and future CO<sub>2</sub> and NO<sub>x</sub> emissions from fired heaters, a novel, and cost-effective approach has been developed by XRG Technologies. Xceed™ technology can be retrofitted in most existing heaters with minimal changes to the heater controls, hardware, or operating practices.

Conventional combustion technology uses flames to release the energy from hydrocarbon fuels and transfer it to the radiant tubes. This is not an efficient process. The high temperature of a flame produces nitrogen oxides (NO<sub>x</sub>) that cause smog and acid rain. The flames also cause large temperature variations inside the firebox and heat the tubes from one side only. As a result of hot spots, radiant tubes often operate close to their limits. Fired heater capacity is typically limited by the tube metallurgy and by localized coking inside the tubes.

To solve these problems, dispersed combustion was developed by XRG based on proven technologies. With Xceed, the tubes are heated more uniformly, resulting in much lower peak temperatures. The firebox efficiency increases, causing the firebox temperatures to drop. The NO<sub>x</sub> emissions from existing burners can be reduced by 50 – 80%, which then allows for an increase in firing rate, combustion air temperature, or both. The technology is insensitive to the type of fuel that is oxidized, which makes it compatible with all hydrocarbon, hydrogen, or ammonia fuels.

A case study will be presented of a large crude heater in the Netherlands, where the fuel efficiency of the heater was increased by 13% and the capacity was increased by at least 30% while meeting sub-20 ppm NO<sub>x</sub> levels. At the same time, the coking problems that the heater used to experience have all but disappeared.

An overview of the technology will be shown, along with the control and instrumentation implications to stay compliant with EN 746-2 or similar safety codes.