



Innovative Combustion Technologies Expands Selective Catalytic Reduction (SCR) Testing Services

Innovative Combustion Technologies, Inc. (ICT) is proud to announce an agreement has been reached with Southern Research to manage and operate its bench-scale SCR catalyst testing facility, effective November 1, 2016. With this agreement, ICT adds the capability to provide catalyst activity testing to its existing SCR tuning and performance field testing capabilities. ICT will continue to operate the facility as an objective third-party to meet the SCR catalyst testing needs of the electric power industry.

To ensure the integrity and validity of the testing and performance data reported by the facility, ICT will be a principal participant in “round-robin” catalyst testing program administered by the Electric Power Research Institute (EPRI) that provides comparisons in results achieved by multiple bench-scale facilities. ICT will also be providing data stemming facility to EPRI on a voluntary and site anonymous basis to build databases of correlation data when permitted by customers of the facility. This will benefit EPRI’s members and the electric power industry as a whole to evaluate SCR best practices, identifying opportunities to lower O&M expenses, determining factors that impact catalyst life or performance, performance enhancements and compiling long-term catalyst performance data to support sound catalyst management decisions.

SCR System Management

Since SCR catalysts degrade in performance with time, especially for solid fuels that can contain various poisons, a proper catalyst management program must account for the catalyst degradation trend as well as the SCR System’s overall performance. SCR owners and operators must have detailed knowledge of both of these variables in order to make accurate decisions regarding catalyst replacement cycles and outage schedules, while also minimizing your Capital and Operational Budget.

ICT has a 20+ year history of providing emissions and boiler testing services to its clients worldwide. In 2011, ICT formed its Environmental Services group in order to provide stack and pollution control equipment performance testing services to its clients to augment the boiler and pulverizer testing services already offered. ICT has provided the field testing services required to document SCR System performance and to tune the system to maximize performance, minimize operating costs, and meet all emissions guarantees and regulations. By pairing its testing services with the Catalyst Testing Facility, ICT now has the capability to provide the full range of services required to maintain optimal SCR System performance and SCR System management practices and procedures.

Questions You Should Ask About Your SCR

- In what condition is my SCR?
- Is the current performance and efficiency acceptable for the hours of use?
- Is the ammonia injection rate appropriate to optimize performance while minimizing slip?
- Is the type of catalyst used appropriate for the fuel fired?
- Are the flue gas temperatures, flows, and compositions balanced entering the SCR?
- Can I reduce SCR inlet NO_x through combustion tuning?
- Is there fouling/plugging of the ductwork and equipment downstream of the SCR?
- Am I replacing my SCR catalyst on a schedule that ensures optimal performance while minimizing my Capital and Operational Budget?
- Is the catalyst charge deactivating as designed?

If you are unsure about the answers to any or all of these questions, ICT has the equipment, experience, and personnel to troubleshoot any issues associated with SCR Systems.

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Common Analyses used for SCR Catalysts Include:

- BET surface area
- Pore size distribution and volume
- ICP-MS or ICP-QQQ for trace element quantification
- Wavelength-dispersive XRF for elemental quantification
- X-ray diffraction (XRD) for percent crystallinity, phase identification, and quantification
- Scanning electron microscope (SEM) imaging
- Energy-dispersive X-ray spectroscopy (including elemental mapping) using SEM
- Physical strength characterization (including compressive and bending strength, grit attrition, etc.)

Capabilities Associated with Bench-Scale Testing Include:

- Determination of SCR catalyst de-NO_x activity
- Determination of SO₂-to-SO₃ conversion rates
- Determination of mercury oxidation rate to be added in the near future
- Physical inspection and dimensional measurements to confirm geometric design and evaluate fouling and structural integrity
- Data compilation and storage to enable historical trends
- Storage of catalyst samples
- Determination of catalyst chemical properties

About the SCR Facility Design:

The Bench-Scale Test Facility is uniquely designed to provide high sample throughput with maximum control and data accuracy. An 800,000 Btu/hr natural gas furnace produces approximately 200 scfm of flue gas, which is cooled and reheated to control moisture content to the desired level. Supplemental electric heat provides fine control, with typical testing temperatures up to 750°F and higher, if required. Ammonia is injected into the furnace to provide the desired level of NO_x. Catalyst samples are tested in (3) test chambers, while (4) downstream aging chamber allow multiple catalysts to be aged while testing is being conducted. This maximizes sample throughput and helps to minimize costs. Bottled liquefied SO₂ and SO₂ conversion reactor provide the required levels of flue gas SO₂ and SO₃. If desired, the facility can be operated with (2) catalysts in series, fully simulating a full-scale two-layer SCR.

