

# ASCR™

## Advanced Selective Catalytic Reduction Systems

**High performance SCR**

In today's utility and industrial sectors, there are many drivers forcing boiler owners to reduce emissions from their power and steam generation facilities. Although regulatory targets may still be uncertain, it is certain that NO<sub>x</sub> requirements are becoming more stringent. Owners must select NO<sub>x</sub> control technologies that meet individual emission requirements while being cost effective.

Fuel Tech's ASCR™ Advanced SCR process maximizes performance and minimizes cost and space requirements when needed. Where high level NO<sub>x</sub> reductions are required, ASCR can be applied to full scale reactor designs to maximize performance. SCR process design is the most critical step to successful SCR performance. Maximizing SCR performance and minimizing its impact on plant operations requires a thorough understanding of each application. For each project, Fuel Tech reviews potential fuels and fuel blends and the expected operating conditions and then utilizes its experience and design expertise to provide the best possible SCR design.

Fuel Tech has many tools to provide the most efficient design for our ASCR systems. Our experimental model studies combined with Computational Fluid Dynamics (CFD) modeling provide insight into the flue gas parameters and flow conditions to develop the optimum duct configuration for the SCR. Fuel Tech works with industry leading catalyst suppliers to determine the appropriate catalyst type and formulation for any given application.

Flow correction devices such as turning vanes, large particle ash (LPA) screens, static mixers, and the GSG™ Graduated Straightening Grid are used to implement an ASCR that meets its performance goals. These important design steps help ensure trouble-free ASCR operation and maximize catalyst life.

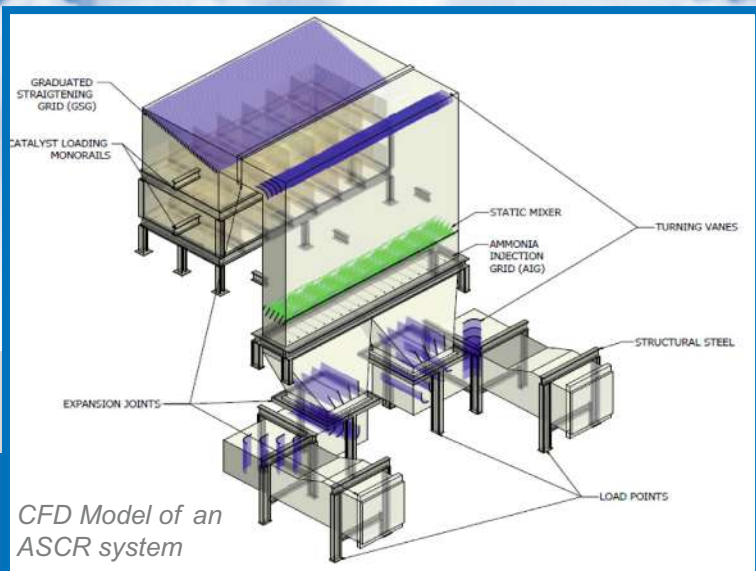
The ammonia injection grid (AIG) is used to feed aqueous or anhydrous ammonia to the catalyst to ensure proper coverage to react with NO<sub>x</sub> within the catalyst. Proper mixing of flue gas constituents and temperatures along with proper flow and velocity profiles to maximize NO<sub>x</sub> reduction and to minimize ammonia slip emissions.



*Catalyst installation*

- 90+% NO<sub>x</sub> Reduction
- Optimized SCR design
- 55,000+ MW experience in SCR process design
- 20,000+ MW of SCR Optimization
- More than 30 systems installed

# ASCR™ Systems



The ASCR system offers high performance and flexibility or compact or full scale reactor applications.

The ASCR technology incorporates a high performance SCR reactor where space permits. By utilizing higher flue gas velocities, the catalyst quantity, weight, and space requirements can be

minimized, potentially leading to the elimination of new foundations and the need to install new “steel to grade.” This allows ASCR to be applied where multiple catalyst layers will not fit, or are not required to meet NO<sub>x</sub> reduction targets. This same optimized SCR design approach can be applied where full scale SCR performance is required.

The ASCR system is designed to minimize the rate of SO<sub>2</sub> to SO<sub>3</sub> conversion which is a precursor to ammonium sulfate/bisulfate formation in the air preheater. This low conversion rate allows for a broader unit operating range and fuel flexibility.

Fuel Tech’s extensive experience base and financial status allow us to offer single source responsibility. System installation and installation management services are also available to meet customer needs. Our experience includes more than 30 SCR system installations and SCR design and consulting support covering more than 50,000 MWs, along with providing SCR services on over 20,000 MWs.

## Fuel Tech ASCR Competencies:

- Experienced Process Design Capabilities with Performance Guarantees
- SCR Arrangement and Configurations
- Specification Development for Catalyst, Internals, Ductwork, and Sub-systems
- Supplier and Vendor Technical Bid Evaluations
- Project Oversight
- Performance Analysis and Optimization
- SCR and Catalyst Management Services
- Single Source Responsibility

The scope of supply for Fuel Tech’s ASCR systems include design, engineering, procurement, delivery, and startup of the following:

- Modeling and Process Design with performance guarantees
- Static Mixer
- LPA Screen
- GSG™ Graduated Straightening Grid
- Ammonia Injection Grid
- Catalyst specification and supply
- SCR Reactor design and supply
- System startup, optimization, and training services
- Reagent Feed System