

**PEERLESS
SCR**

**Peerless
Leadership
in**

**Selective
Catalytic
Reduction
Systems
for
Gas
Turbines
and
HRSGs**



- **Total System Integration**
- **Innovative Designs**
- **Catalyst Selection**
- **Startup, Field Service and Training**
- **Installation and Retrofit Capability**
- **Flexible Scope of Supply**

Peerless SCR Systems for Gas Turbines and HRSGs

Peerless - Unequaled Experience

With more than 150 operating systems in the United States, Peerless is the country's leading SCR system supplier, providing sole-source responsibility for NO_x emission guarantees. These performance guarantees are backed by our proven experience to fully integrate the SCR system into the overall plant process. Peerless' expertise and experience are unequalled in the industry.

Selective Catalytic Reduction (SCR)

As fossil fuels are combusted in gas turbines and Heat Recovery Steam Generators (HRSGs), nitrogen oxides (NO_x) are formed. To minimize the harmful effects of these undesirable pollutants, NO_x emissions are stringently regulated by air quality agencies worldwide.

SCR is the most effective and proven technology to reduce NO_x emissions. With guaranteed reductions greater than 90%, SCR is adaptable to a wide range of temperature and service conditions. Peerless SCR systems reduce NO_x by optimally distributing ammonia over the catalyst bed, reducing NO_x to harmless nitrogen and water.

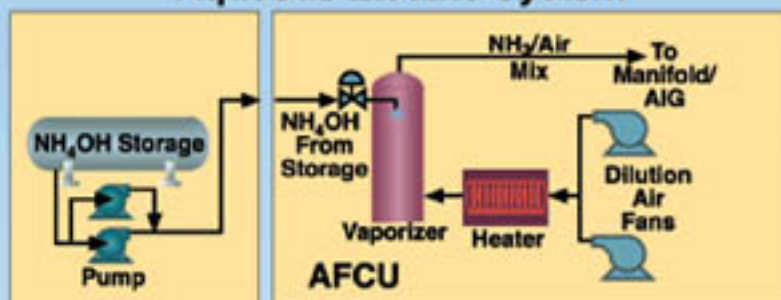
Anhydrous ammonia (NH₃) is the most economical reagent to use, however, the growing trend by end-users and operators is the use of aqueous ammonia (NH₄OH). Aqueous ammonia is a safer reagent to transport, handle and store than anhydrous ammonia. Vaporization of the aqueous ammonia solution is required to reach the base ammonia yield needed for the reaction. Typically, this vaporization is accomplished by using a hot air source. Exhaust gas can be withdrawn from the HRSG (refer to Aqueous Exhaust Recirculating diagram), or ambient air can be heated using an electric heater (refer to Aqueous Electric diagram). Direct injection is feasible for simple-cycle gas turbines under certain design conditions.

Peerless offers performance guarantees for the entire SCR system, beginning with careful selection of the catalyst. Since Peerless can select from several catalyst manufacturers, our customers are assured the best catalyst for their particular application. This flexibility in catalyst selection ensures long-term reliability and minimal economic impact.

Computational Fluid Dynamics (CFD)

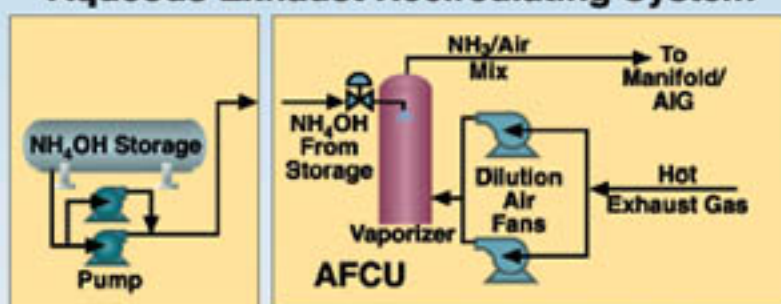
Peerless is the established leader in innovative SCR design methods that emphasize the importance of good ammonia distribution. Peerless analyzes ammonia injection grid designs and duct arrangements with Computational Fluid Dynamics (CFD), a valuable tool to the overall SCR performance.

Aqueous Electric System



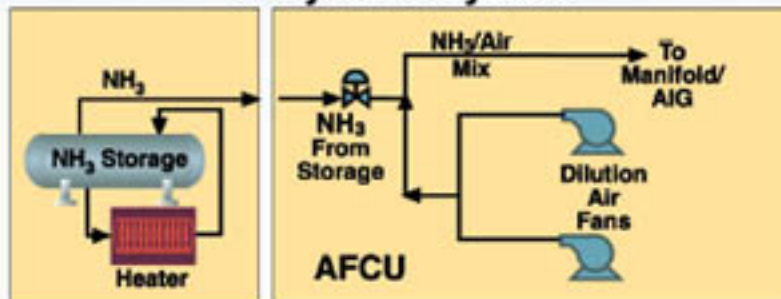
- Aqueous ammonia flow rate and ammonia concentration determine equipment size
- Power usage varies with aqueous ammonia flow
- Typically used with high sulfur content fuels
- Heat source can be steam

Aqueous Exhaust Recirculating System



- Aqueous ammonia flow rate, concentration and ambient temperature determine equipment size
- Power usage based on fan BHP
- Typically used for clean, low sulfur content fuels
- High quality fans essential

Anhydrous System



- Heater cycles to maintain pressure in tank
- Heat source typically electric
- More economical than aqueous ammonia systems
- Storage and handling systems are very important





The largest Aqueous Electric AFCU Skid in the world. This 940 KW unit is capable of vaporizing 1,500 lbs/hr of aqueous ammonia.



This Aqueous Exhaust Recirculating AFCU Skid is capable of vaporizing 550 lbs/hr of aqueous ammonia.



This Anhydrous AFCU Skid is operating at a 240 MW merchant power plant in Texas.



Peerless - Scope of Supply

Peerless maintains a flexible approach to the scope of supply. We design and manufacture complete SCR systems including installation in some instances. Peerless specializes in the complete ammonia system, from the storage, handling and transfer equipment, to the vaporization, dilution, control and injection systems. Specify Peerless to ensure the most SCR system for your next project.

PEERLESS

Peerless supplies the following SCR System components for Gas Turbines and HRSGs:

- **Ammonia Storage and Handling**
 - Truck and Rail Unloading Equipment
 - Aqueous/Anhydrous Storage Tanks
 - Compressor and Pump Skids
 - Safety Equipment
- **Ammonia Flow Control Unit (AFCU)**
 - Vaporization
 - Measurement
 - Dilution Air
 - Control Systems
- **Ammonia Injection Grids (AIG)**
 - Manifolds
 - Internal Grids
 - Multiple Flow Control Zones
- **Catalyst**
 - Multiple Catalyst Suppliers
 - Performance Guarantee
- **Reactor Housing**
 - Internal Catalyst Support Structure
 - Complete Sealing System
 - Reactor Instrumentation Package
 - Hoist and Monorail Systems
- **Installation / Turnkey Construction**
 - Commissioning
 - Installation and Start-up Supervision
 - Trouble Shooting / Emissions Diagnostics
 - Field Service and Training

PEERLESS

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