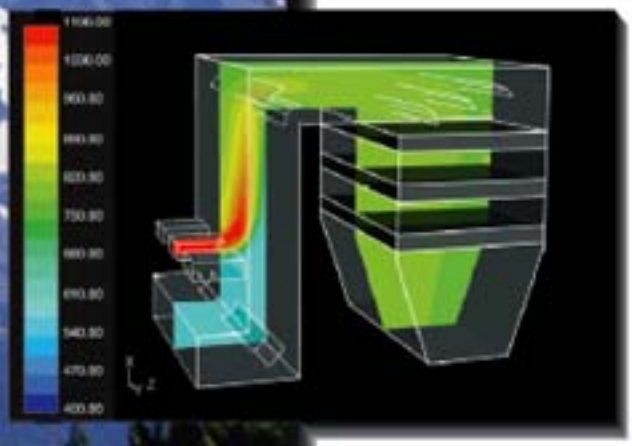
PEERLESS SCR

Peerless Leadership in Ammonia Systems for Utility Boilers



- Unparalleled Experience
- Innovative Designs
- Flexible Scope of Supply
- Ammonia Source Options
- CFD Design Capabilities

PEERLESS MFG CO
DALLAS TEXAS

Peerless Ammonia Systems for Utility Boiler SCR

The Ammonia System - A Critical Component of Your SCR

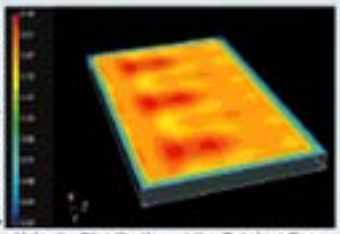
The ammonia system should be a transparent component of your SCR system. Numerous factors must be considered to achieve smooth operation and avoid significant problems. These factors include the type of ammonia to use, storage volume, vaporizer location, vaporizer heat source and control method. As a purchaser and/or operator of an SCR system, you need a teammate with the experience and understanding of how essential it is for the ammonia system to fit into your design and operational requirements.

Peerless - Unparalleled Experience in Ammonia Systems

Peerless is the leading SCR ammonia systems provider in the United States. We offer comprehensive design and engineering expertise in vaporization, ammonia flow, ammonia injection and process control systems. Peerless has supplied ammonia systems for over 150 SCR units since 1988. These systems range in size from 3 lbs/hr up to 3,650 lbs/hr, using ammonia from 19% aqueous to 99.95% anhydrous. Our vaporizers use heat sources including electric heaters, steam, hot water, glycol, flue gas and gas burners. While most of these systems have been installed on Peerless supplied SCR units in the gas turbine market, our experience directly applies to the supply of ammonia systems to the utility boiler retrofit market. We will seamlessly integrate the ammonia system into your project to ensure trouble-free operation.

CFD Design Capabilities

Peerless makes available to our teammates, the services of our Computational Fluid Dynamics (CFD) Department. Our CFD team can assist you on such design issues as minimizing pressure drop and eliminating temperature gradients.



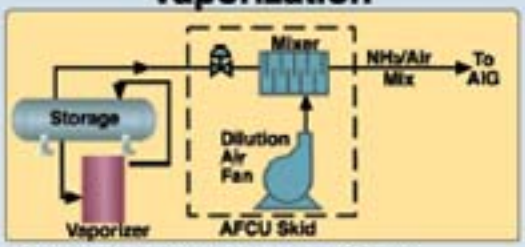
Velocity Distribution at the Catalyst Face.

The experience of our team, when combined with our advanced computer systems, can be useful to an SCR system supplier throughout a project from proposal to start-up. A study of the preliminary layout can optimize duct arrangement prior to a physical flow model. The quantity, shape and location of turning vanes can be modeled much more effectively by CFD than by a physical model.

CFD also offers the best method of determining the bypass flow and duct arrangement if an economizer bypass is required. CFD can extend catalyst life by minimizing deviations of velocity and temperature distribution at the catalyst face.

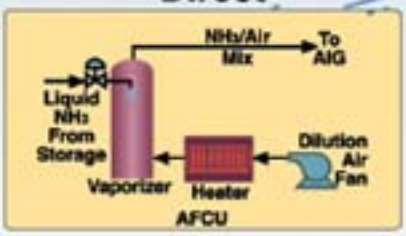
The main benefit of using CFD in the design process is the ability to predict and reduce operational deviations. By minimizing duct requirements and reducing design time, CFD can offer a commercial advantage to those SCR system suppliers that choose to utilize it.

Close-Coupled Vaporization

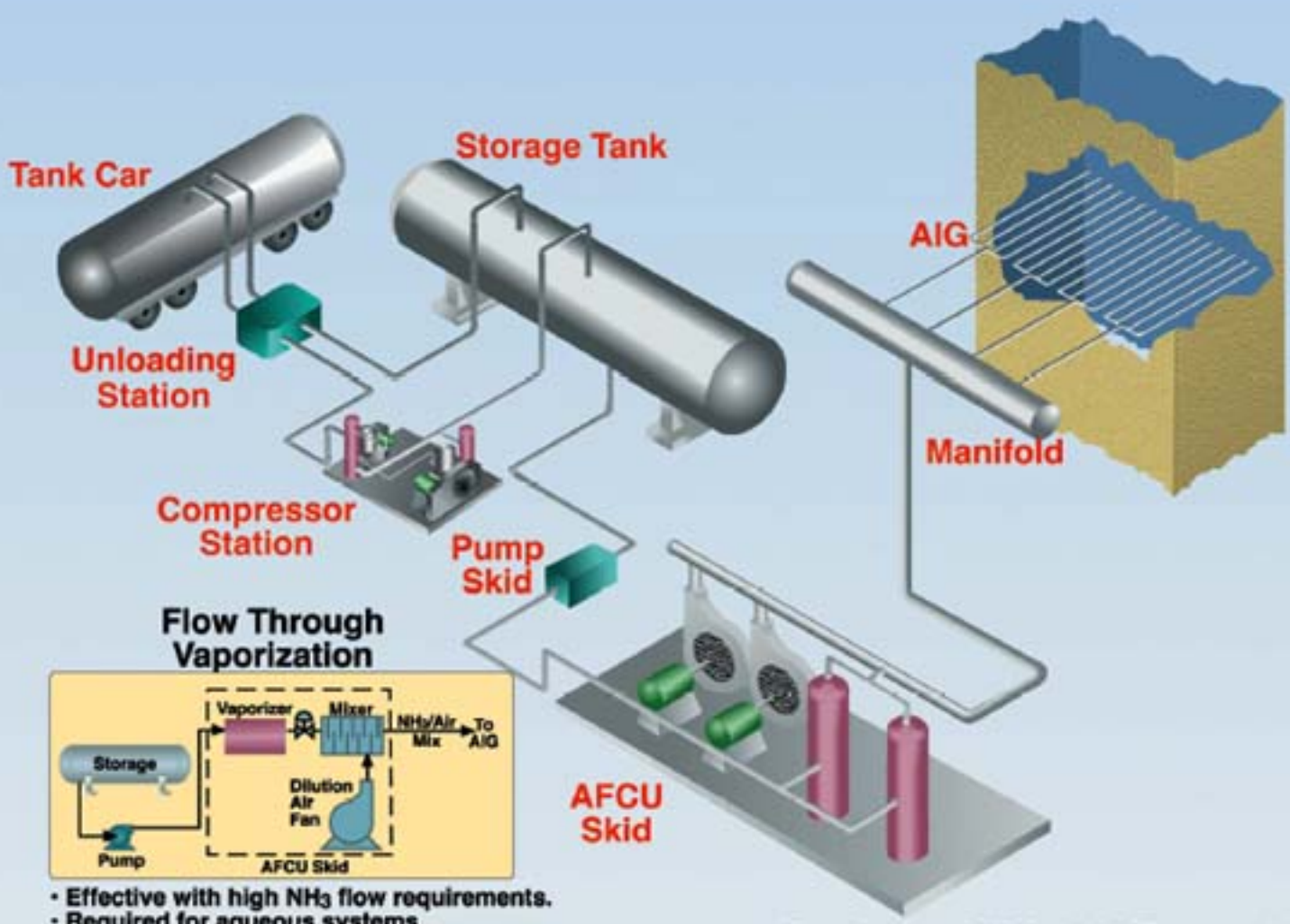


- **Used when ambient conditions provide required NH_3 vapor flow from tank.**
- **Vaporizer cycles to maintain pressure in tank.**
- **Heat source can be electric or steam.**

Aqueous Direct



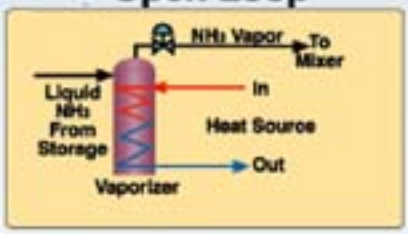
- **High temperature removes need for stainless steel components.**
- **Heat source can be electric or steam.**
- **Flow rate and ammonia concentration determines equipment size.**



Flow Through Vaporization

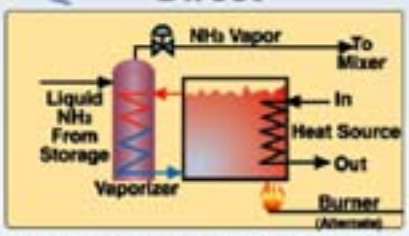
- Effective with high NH_3 flow requirements.
- Required for aqueous systems.
- Allows multiple units to share common storage.
- Minimizes piping between storage and AFCU.
- Multiple vaporization alternatives.

Anhydrous Open Loop



- Most compact and efficient vaporization method.
- Heat source can be electric, steam, hot water, or glycol.

Anhydrous Direct



- Isolates ammonia from heat source.
- Heat source can be electric, steam, hot water, glycol, or gas/oil burner.
- Allows maintenance without draining ammonia.
- Heating fluid can be water or glycol.

Peerless - A Valuable Teammate

During the last ten years, Peerless Mfg. Co. has earned a reputation for the finest service, the best products, the most innovative designs and the most qualified people in the SCR industry. When you specify Peerless ammonia systems for your SCR projects, you get this background, combined with our engineering, manufacturing, and state-of-the-art CFD design capabilities.

It takes more than just bolting a heat exchanger and control valve on a skid to make an effective ammonia system. A truly effective ammonia system supplier combines experience with understanding of how this critical component interacts with plant operations. Peerless can contribute from the very beginning of a project with CFD modeling through start-up assistance to ensure truly transparent long-term operation of your ammonia system.

Give us a call today and let us show you how our experience and resources can be utilized to provide an ammonia system that meets all your operational and schedule expectations.

PEERLESS

Peerless supplies the following Ammonia System components for Utility Boilers:

- **Ammonia Storage**
  - 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**
  - Manifold
  - Internal Grid
  - Multiple Flow Control Zones

- **Overall Control Systems**
  - State-of-the-art controls
    Panel mounted PLC on AFCU
    Interfaced with existing DCS
  - Full Instrumentation

PEERLESS

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