

## Ammonia Refrigeration Unit Operation and Maintenance

This is a three-day, lecture and hands on course that covers the basic mechanical refrigeration cycle, the control and handling of ammonia, major installed system components, and system operation. The maintenance portion of the course deals mainly with service techniques for the installed equipment. This is a technician-level course for both operating and maintenance personnel, providing the knowledge base necessary to begin working on the equipment and to get the most out of equipment-specific training.

### I. Ammonia Refrigeration Basics

- Ammonia Characteristics
- Single stage Ammonia Systems
- Two-Stage Ammonia Systems

### II. Suction Accumulators and Intercoolers

- Need for suction accumulators
- Accumulator design features
- Liquid/vapor separation
- Intercoolers
- Shell-and-coil vs. flash-type intercoolers
- Alternate intercoolers

### III. Liquid Overfeed (Recirculation) Systems

- Liquid overfeed
- Recirculation systems purpose and design
- Recirculation system advantages and disadvantages
- Recirculation vessel design
- Pumper drum system
- Controlled pressure receiver system

### IV. Positive-Displacement Compressors

- Reciprocating Compressors
- Sliding Vane Rotary Booster Compressors
- Oil Flooded Screw Compressors
- Screw Compressor Units
- Ammonia Systems Lubrication/Oil Management

### V. Evaporators, Condensers, and Controls

- Liquid Ammonia Evaporator Supply Methods
- Evaporators
- Air Unit Defrost Systems
- Evaporative Condensers
- Control Valves and Switches

### VI. Purging, Piping, and Safety

- Purging Air and other Non-condensables
- Ammonia System Piping
- Ammonia System Safety Codes and Guidelines
- OSHA Process Safety Management
- EPA Regulations and Ammonia Safety

## VII. Site Service Techniques

- Leak Detection
- Installing a Gauge Manifold
- Gauge Manifold
- Evaluating Performance of System
- Removing Refrigerant
- Open and Make Repairs
- Pressure Testing
- Evacuating a System
- Charging a Repaired System
- Evaluate Repair· Pressure Testing
- Evacuating a System
- Charging a Repaired System
- Evaluate Repair