

Ammonia Refrigeration Systems

This is a four-day, lecture-based course that covers the basic mechanical refrigeration cycle, the different refrigerants available, major refrigeration system components, system operation, service, and troubleshooting with a focus on ammonia systems. This is a technician-level course for both operating and maintenance personnel, providing the knowledge base necessary to work on ammonia refrigeration equipment.

I. Refrigeration Fundamentals

- The Refrigeration Cycle
- Physical Properties Of Various Refrigerants
- Refrigerant Performance Tables
- Compressor Types
- Cooling Units
- Lubrication
- Secondary Refrigerants

II. Ammonia Systems

- Ammonia Refrigeration Plant Safety
- Basic Ammonia Refrigeration Principles
- Component Identification

III. Operation of Industrial Ammonia Refrigeration Systems

- Starting the System and Putting On-Line
- Operate the System and Achieve Stability
- Purging Non-Condensable Gases
- Changing Operating Parameters
- Determining the System Load
- Determining Operating Efficiencies
- Automated Operation
- System Shutdown
- Pumpdown Procedures

IV. Sub-Systems and Components

- Compressors
- Evaporators
- Pumped Liquid Recirculation Systems
- Condensers and High-Pressure Receivers
- Two-Stage Systems and Defrost Systems
- AC Frequency Drives
- Sensors: Temperature, Pressure, and Liquid Levels: Use and Calibration

V. System Installation and Maintenance

- Compressor Installation Fundamentals
- Compressor Alignment
- Compressor Service and Maintenance
- Evaporative Condensers
- Unwanted Liquid Slop
- Oil Filling and Draining Procedures
- Installing a Gauge Manifold
- Removing Refrigerant
- Pressure Testing
- Evacuating a System
- Charging a Repaired System
- Evaluate Repair