



POLK STATE
Corporate College

Industrial Ammonia Refrigeration and Certification Training

Ammonia Refrigeration: Level II

8:00 am – 5:00 pm

\$1039.00

The Ammonia Refrigeration Systems Course

This course provides an in-depth study of ammonia refrigeration systems using *The Refrigerating Engineers and Technicians Association (RETA): Industrial Refrigeration II Manual*. In addition to the textual information, information from manufacturers and varied media relevant to efficient systems operations and maintenance are covered. This seminar is specifically designed for plant managers, operating engineers, maintenance managers, ammonia system technicians, ammonia system operators, and roundsman. It is designed for individuals who have already completed the *Ammonia Refrigeration: Level I Course*. Attendees who have not completed the previous course should have experience in the operation of an ammonia refrigeration system, or comprehensive knowledge of ammonia refrigeration principles. The course provides discussion of the following:

Direct Expansion Systems:

Course content focuses on the application and operation of expansion devices (e.g., hand-expansion valves, fixed-flow regulators, adjustable-flow regulators, and thermal-expansion valves) as they affect evaporators.

Flooded Systems:

This course reviews flooded systems as they relate to evaporator operation, surge-drum operation, and level control. Several types of liquid-level control techniques are discussed, including the positive and negative attributes of each.

Recirculated Systems:

The course showcases the roots and modern-day applications of recirculated systems. This includes evaporators, re-circulator package designs, and mechanical refrigerant pumps, as well as the operation of pumper drums.

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Secondary Coolant Systems:

Though the use of brine circulation systems is on the decline, new applications are currently centered on their use as secondary refrigerants. The course discusses the common applications of different coolants and the pitfalls associated with each.

Booster Systems:

As the design temperatures of ammonia refrigeration systems drop (some as low as -60 F), the use of booster systems (multi-stage compression systems) is increasing. This course discusses chaining a compressor in stages, the use of vessels, and intermediate cooling mechanisms.

Heat Flow in Refrigeration Systems:

A review of the factors controlling the transfer of heat is provided, including and how these can be affected by operational changes.

Enthalpy:

This course surveys the basics of the *Pressure-Enthalpy* (Mollier Ph) *Diagram* in relation to refrigeration systems and explains this information's relevance when assessing the efficiency and proper operation of a system.

The Psychrometric Chart:

The *Psychrometric Chart* is a useful tool, enabling the operator to discern unseen loads and other factors that may be affecting an operating refrigeration system, such as weather and seasonal changes.

Evaporator Defrost:

One of the unavoidable features of low-temperature cooling is frost accumulation on evaporator coils. This course explains the most common methods for frost removal from conventional air units.

Mechanical Integrity:

Mechanical integrity is the most important and practically attainable requirement of Process Safety Management (PSM) protocols, and it should be consistently factored into all Risk Management Plans (RMP).

Hot-Work Permits:

Course discussion canvases the differences between the Occupational Safety and Health Administration's (OSHA) General Industry Requirement and OSHA's Process Safety Management Requirement.

Management of Change:

This course explores when management of change is considered a replacement-in-kind.

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Incident Investigation:

Proper incident investigation is covered including the specifics required for proper documentation.

Emergency Planning and Response:

A facility must be aware of what it can expect with regard to local emergency agencies during a crisis. This course reviews agency requirements regarding the formation of an Emergency Response Team.

Compliance Audits:

Compliance audits are required every three years. [For a facility managing over 10,000 pounds of refrigerant](#), this means that the facility should be able to show an inspector two completed audits, including follow-up documentation.

Trade Secrets

This course also explores the Occupational Safety and Health Administration's definition of a trade secret, and how this standard can be used to protect an employer.

Off-Site Consequence Analyses:

Discussion enables participants to explore a number of scenarios (including worst-case scenarios), as well as consider the populations affected during various incidents. Mitigation systems, technical guidance, and scenario-modeling parameters are incorporated into analyses.

Consideration of Environmental Impact:

Participants apply course information to identify, explore, and discuss various environmental impacts, and then incorporate these considerations when formulating analyses and making decisions.

Homeland Security:

This course reviews the new standard set by Homeland Security, the possible effects on facilities, the registration process and compliance, as well as the new Top Screen Survey protocols.

Other Topics:

This course provides many additional relevant topics including clarification of changes to recent standards, enforcement of regulations, as well as accident history and reporting according to state and federal guidelines.

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Course reservations may be made by contacting:

Wagner- Meinert, LLC

260-489-7555

www.wagner-meinert.com

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