Under 10,000 lbs of Ammonia...
What Do I Need to Do for Compliance?

By Kent Harmon

Bigger facilities that have in excess of 10,000 lbs of ammonia must comply with the PSM standard. But what about facilities with less than 10,000 lbs?

When a facility has less than 10,000 pounds of ammonia in the facility system, both OSHA and EPA apply their respective General Duty Clause (GDC) and/or Recognized and Generally Accepted Good Engineering Practices (RAGAGEP) for inspections, compliance and generating citations.

These clauses (GDC and RAGAGEP) outline and describe the responsibilities of owners and operators for being diligent in preventing chemical releases ... including an employer’s recognition of hazards and — most importantly — the industry’s recognition of hazards! The most prominent ammonia refrigeration (industry) consensus standards are issued by IIAR and ASHRAE-15.

Those who deal with PSM know compliance with all the elements listed below is mandatory. If a facility has less than 10,000 lbs of ammonia in a facility, I recommend awareness of the first four elements (highlighted in blue) and compliance with the last nine (highlighted in yellow).

Compliance with a General Duty Clause (GDC) basically involves the following:

- Identification and assessment of process hazards.
- Establishment and maintenance of a safe process system
- Minimizing consequences of any ammonia release
- Most important! — Adherance to industry codes and standards.
  Note: This is commonly referred to as RAGAGEP (Recognized and Generally Accepted Engineering Practice)

Compiling and updating the following information is essential to GDC compliance:

- Process Safety Information (PSI), including current P&IDs
  Note: A crucial standard to be considered is in IIAR Bulletin #110 - Section 4: Records
- Process Hazard Analysis (PHA) with a discussion of potential release scenarios and their impacts
- Operating Procedures
- Training
- Pre-Startup Procedures
- Mechanical Integrity and Preventive Maintenance
- Hot Work Permit
- Incident Investigation
- Emergency Actions, Planning, and Response

Even though compliance can seem confusing, remember the old addage: “How do you eat a whale? One bite at a time.” Little bites will get you there.

Be compliant, be safe.
The purpose of this Hands-on workshop is to develop an understanding of the function, troubleshooting, maintenance and repair of all type of valves used in our industry. This three (3) day workshop will include the most common valves manufacturers:

HANSEN • PARKER/RS • DANFOSS

INSTRUCTOR
Chris Harmon, RAI

TOPICS COVERED:
• Overview of each valve and valve type
• Function
• Maintenance
• Troubleshooting
• Repair
• Problems
• Tips
• Hands on – actual valve repair
• Electronic controllers
  o Operation
  o Adjustments
  o Troubleshooting
  o Issues
• Latest development in valves

WHO SHOULD ATTEND
End users • industrial refrigeration operators and technicians • plant managers • plant or process engineers

REGISTRATION INVESTMENT – $715
Successful completion of the class provides attendees with 24 professional development hours (PDH)

Investment includes materials and continental breakfast.

Due to hands-on portion of this workshop, the class size will be limited.

CONTACT & REGISTRATION INFORMATION
Industrial Consultants
PO Box 833 • Owasso OK  74055
www.ammonia.com
Tel: 918-274-8639 • FAX 918-274-8816
Email: info@ammonia.com
This course is designed as a review course addressing materials that may be included in the RETA certification exam(s). This course is not intended to walk the attendee through the exam(s).

Who Should Attend
Industrial refrigeration operators • technicians • consultants end-users • plant managers • plant or process engineers

Registration Investment $395
Successful completion of the class provides attendees with 16 professional development hours (PDH)

Investment includes lecture materials (review textbook) and daily lunch. It is recommended for students to have reviewed and bring the following textbooks: RETA Industrial Refrigeration One and Two (IR1 and IR2) and Basic Electricity 2 (BE2) - available at http://www.reta.com.

Special for attendees — All review course attendees will be enrolled in the 2018 Central Florida Regional Conference. The Regional Conference enrollment provides for (but may not be limited to) receipt of Regional Conference attendees materials as well as participation in Exhibit Hall hours.

Enrollment is limited to 30 students.

REGISTER ONLINE TODAY!

Contact Information
For questions regarding the Refrigeration Review Course, please contact:

Industrial Consultants
PO Box 833 • Owasso OK  74055
www.ammonia.com
Tel: 918-274-8639 • FAX 918-274-8816
Email: info@ammonia.com

RETA CIRO or CARO Certification Exam
Course attendees may elect to sit for a RETA certification exam (CIRO or CARO) following the course. Test candidates must preregister (submitting all paperwork and payment) for the certification exam at least 2 weeks in advance of testing date. For details on how to register and arrange for your RETA certification exam, go to the RETA website at http://www.reta.com. If you have questions regarding the Certification Exam, please contact Dan Reisinger at RETA HQ (email dan@reta.com) or 541-497-2955.
Refrigeration Review
Course Outline

Refrigeration Fundamentals Review

Basic Refrigeration Terms and Principles
- Units of measurement: area, volume, specific volume, rate (CFM, GPM), temperature, pressure (psia, psig) pressure/temperature chart
- Heat: conduction, convection, radiation, BTU, sensible heat, latent heat, specific heat, latent heat of vaporization/conduction, specific heat, subcooling, superheating, saturation, water heat curve
- Ton of refrigeration, heat calculations

Heat Flow in Refrigeration Systems
- Factors that affect conduction of heat: area, temperature difference, thermal conductivity, distance the heat passes through
- Conditions which increase/decrease effect of evaporator performance
- Pressure-enthalpy or Mollier Diagram

The Basic Refrigeration Cycle – Heat Flow
- The flow of heat through the four main components
- Basic P&ID for a system
- Heat of compression, compression ratio, pressure drop, noncondensable gases

Properties of Refrigerants
- Refrigerant selection factors
- Refrigerant operating characteristics: evaporator pressure, condensing pressure, theoretical discharge temperature, refrigerating effect (BTU/lb), Mass flow (lb/min/ton)

Compressors
- Types of compressors:
  - Positive displacement, dynamic displacement
  - Open drive, hermetic
  - Reciprocating, rotary
- Reciprocating compressor: horizontal, VSA, V-W
- Rotary vane compressor
- Rotary screw compressor: compression cycle, oil
- Loading of a compressor
- Two stage compression and booster compressors
- Operation and maintenance: oil, oil heaters, slugging, log sheets

Evaporators/Cooling Units
- Function
- Fluid cooling, air cooling, forced convection, blast freezing, plate freezing
- Secondary coolant

Condensers
- Function and general types
- Shell and tube condenser
- Causes of elevated head pressure
- Cleaning, leaking, re-tubing
- Evaporative condenser
- Basic design components and flow of refrigerant
- Effect of humidity
- Scale, corrosion
- Head pressure control, fans, motors, dampers

Receivers
- Function
- Typical receiver connections and their functions
- King valve
- Over-pressure protection

Purging
- Function
- Sources of noncondensables
- Types: manual, on-line, automatic
- Hansen purger

Refrigeration System Operations

Low Side Feed Valves and Controls
(Evaporator Feed)
- Hand expansion valve (HEV)
- Thermostatic valve (TXV):
  - forces that drive the valve
  - nine basic points of operation
  - equalization
- Solenoid valve
- Float switch/level sensor
- Float valve

Direct Expansion System (DX)
- Basic design
- Stop-over/slugs
- Top feed/bottom feed
- Suction line accumulator

Flooded Systems
- Basic design
- Oil accumulation
- Resistance to heat transfer: product side/refrigerant side
- Causes of over-fill
- Consequences of stop-over (slugs)

Pumped Liquid Recirculation Systems
(Liquid Overfeed)
- Basic design and recirculation ratio
- Pumps: mechanical and gas operated
- Basic rules for operation of centrifugal pumps

- Gas pumper systems: single, double, constant pressure
- Pump sizing, line sizing
- Refrigerant charge
- Start-up and basic operation, oil removal
- Advantages/disadvantages

Secondary Coolant Circulation System
- Direct vs. indirect
- Common secondary coolants
- 2 pipe/3 pipe system
- Defrost of secondary coils
- Pump types for secondary refrigerant
- Heat exchangers:
  - Open tank
  - Shell and tube
  - Plate and frame and its advantages

Two Stage System
- Basic design of operation
- Horsepower savings
- Compression cycle: booster compressor/high stage compressor
- Intercooler function: shell & coil, flash type
- Noncondensables
- Cascade System

Coil Defrost
- Moisture content, pump down, fan delay, pressure equalization
- Air defrost
- Electric defrost
- Water defrost
- Continuous defrost
- Hot gas defrost operation and guidelines
- Causes for excess of ice buildup

Measuring System Performance
- Measurements: horsepower, BTU, HP/ton, Kilowatt, Kw/ton, Kw demand
- Calculation: compression ratio, cost and efficiency

Electricity
- Fundamentals: Ladder Diagram
  - Rungs of the ladder
  - Symbols
  - Switches
  - Circuits
Central Florida (CF)
Ammonia Refrigeration Regional Conference

August 27-28, 2018 • Orlando, Florida

Registration - $60 per person
Fee includes:
• 2 full days of programming
• Daily box lunch and breaks
• Monday reception
• Hands-on workshops
• Compressor workshops
• Equipment Certification
• Manufacturer-specific workshops
• 10,202 sq ft exhibit hall
• Technical sessions
• Attendee materials

$60 per person registration fee provides 2 full days of training...

REGISTER ONLINE TODAY AT https://www.eventbrite.com/e/cf-ammonia-refrigeration-regional-tickets-46553358348
Monday - August 27, 2018

6:45 am  REGISTRATION OPEN

7 - 8:45 am  CONTINENTAL BREAKFAST  Sponsored by Stellar
EARLY BIRD DRAWING  Sponsored by Isel
EXHIBIT HALL OPEN

8:45 - 9:30 am  WELCOME, INTRODUCTION & KEYNOTE  (1 PDH)
Epic Fails - Arlie Farley, CIRO, CARO

9:30 am  BREAK  - Sponsored by Isel & Airgas

9:45 - 10:35 am  HANDS-ON TRAINING  (1 PDH)  Limited seating
Plate Heat Exchanger Break-down/Re-assemble Manufacturer-specific Workshop - Danny Hauenstein, Alfa Laval
Running a Field Evap Test - Ken Williams, Chemical Transfer

9:45 - 10:35 am  TECHNICAL SESSIONS  (1 PDH)
Mass Flow and Why it is Important for Operators - Doug Sweet, Synergy Refrigeration
Evaporative Condenser Maintenance - Ryan Snyder, Evapco
The Importance of Training Competent Incident Commanders - David Bennet, Industrial Consultants

9:45 - 11:35 am  HANDS-ON TRAINING  (2 PDH)  Limited seating
Compressor Tear-down - Lee Evans, Howden
Valve Training (part 1) - Dan Connelly, Wagner-Meinitz LLC
Equipment Safety Training - Fork Lift Fred Coogle, Fred Coogle Productive Safety

10:45 - 11:35 am  TECHNICAL SESSIONS  (1 PDH)
Cooling as a Contact Sport - Jake Farley, CIRO, CARO, Farley’s Refrigeration
Insulation for Effectiveness and Efficiency; Goal or Reality? - Nate Brink, Polyguard Products
Intro to Certified Refrigeration Energy Specialist (CRES) Why is it necessary?- Jeff Sloan, Wagner-Meinitz LLC

10:45 - 11:35 am  HANDS-ON TRAINING  (1 PDH)  Limited seating
Plate Heat Exchanger Break-down/Re-assemble Manufacturer-specific Workshop - Danny Hauenstein, Alfa Laval

11:35 am - 1 pm  BOX LUNCH & OPPORTUNITY DRAWING - EXHIBIT HALL OPEN
Lunch Sponsored by Fl. Smith
Opportunity Drawing Sponsored by Isel

1 - 1:40 pm  GENERAL SESSION  (1 PDH)
Chemical Facility Anti-Terrorism Standards (CFATS) - Nadya Owens, Department Of Homeland Security

1:50 - 2:40 pm  TECHNICAL SESSIONS  (1 PDH)
“Hazmat” What to Expect - Michael Chapman, Stellar
Oh No You Didn’t! - Jack Piho, PE, Piho Engineering
How to Prepare and Survive a PSM / RMP Inspection - Brian Chapin, RC&E

1:50 - 3:40 pm  HANDS-ON TRAINING  (2 PDH)  Limited seating
Compressor Tear-down - Lee Evans, Howden
Manufacturer-specific Session - Todd Metsker Parker-Hannifin; a Division of R/S
Valve Training (part 2) - Dan Connelly, Wagner-Meinitz LLC
Equipment Safety Training - Scissor Lift Fred Coogle, Fred Coogle Productive Safety

2:40 pm  BREAK  - Sponsored by Isel & Airgas
Monday - August 27, 2018 (continued)

2:50 - 3:40 pm TECHNICAL SESSIONS (1 PDH)
  NXTCOLD Ultra Low Charge Ammonia Systems- Rusty Walker, Hillphoenix
  Non-destructive Testing; What Every Operator/Technician Should Know - Jim Kovarik, Gama Graphics Services
  The Importance of Training Competent Incident Commanders - David Bennett, Industrial Consultants

3:40 - 5:45 pm RECEPTION & OPPORTUNITY DRAWING - EXHIBIT HALL OPEN
  Reception Sponsored by Bonar and Evapco
  Opportunity Drawing Sponsored by Isel

Tuesday - August 28, 2018

8 - 9:50 am REGIONAL RUNAMUCKUS (2 PDH) - Industrial Refrigeration Presentation & Trivia Contest
  Sponsored by Farley’s Frigeration & Piho Engineering
  John (Jack) Piho, PE, Piho Engineering and Arlie Farley, CIRO, CARO, Farley’s Frigeration

9:50 am BREAK Sponsored by Industrial Consultants & Marking Services

10 - 10:55 am TECHNICAL SESSIONS (1 PDH)
  NXTCOLD Ultra Low Charge Ammonia Systems- Rusty Walker, Hillphoenix
  How to Prepare and Survive a PSM / RMP Inspection - Brian Chapin, RC&E
  Cooling as a Contact Sport - Jake Farley, CIRO, CARO, Farley’s Frigeration
  MIRO Hot Point

10 - 11:50 am HANDS-ON TRAINING (2 PDH) Limited seating
  Compressor Tear-down - Arlie Farley, CIRO, CARO
  Manufacturer Specific Workshop - Todd Metsker, Parker-Hannifin; a Division of R/S Valve Training (part 1) - Dan Connelly, Wagner-Meinert LLC
  Equipment Safety Training - Fork Lift Fred Coogle, Fred Coogle Productive Safety

11 - 11:50 am TECHNICAL SESSIONS (1 PDH)
  "Hazmat" What to Expect - Michael Chapman, Stellar
  Intro to Certified Refrigeration Energy Specialist (CRES) Why is it necessary? - Jeff Sloan, Wagner-Meinert LLC
  Mass Flow and Why it is Important for Operators - Doug Sweet, Synergy Refrigeration
  Farley’s Frigeration Hot Point

11:50 am - 1 pm BOX LUNCH & OPPORTUNITY DRAWING - EXHIBIT HALL OPEN
  Lunch Sponsored by Kolbi & Centermark Contracting Services
  Second Chance Opportunity Drawing Sponsored by Calibration Technologies

1:10 - 2 pm HANDS-ON TRAINING (1 PDH) Limited seating
  Plate Heat Exchanger Break-down/Re-assemble Manufacturer-specific Workshop - Danny Hauenstein, Alfa Laval
  Ammonia Evacuation- Ken Williams, Chemical Transfer

1:10 - 2 pm TECHNICAL SESSIONS (1 PDH)
  The Importance of Training Competent Incident Commanders - David Bennett, Industrial Consultants
  Non-destructive Testing; What Every Operator/Technician Should Know - Jim Kovarik, Gama Graphics Services
  How to Prepare and Survive a PSM / RMP Inspection - Brian Chapin, RC&E
  Kelly Refrigeration Hot Point

1:10 - 3 pm HANDS-ON TRAINING (2 PDH) Limited seating
  Compressor Tear-down - Arlie Farley, CIRO, CARO, Farley’s Frigeration
  Valve Training (part 2) - Dan Connelly, Wagner-Meinert LLC
  Equipment Safety Training - Fork Lift Fred Coogle, Fred Coogle Productive Safety

2:10 - 3 pm TECHNICAL SESSIONS (1 PDH)
  Evaporative Condenser Maintenance - Ryan Snyder, Evapco
  Daily Rounds and Troubleshooting, Jeff Sloan, Wagner-Meinert LLC
  Insulation for Effectiveness and Efficiency; Goal or Reality? - Nate Brink, Polyguard Products

2:10 - 3 pm HANDS-ON TRAINING (1 PDH) Limited seating
  Plate Heat Exchanger Break-down/Re-assemble Manufacturer-specific Workshop - Danny Hauenstein, Alfa Laval

3 pm BREAK Sponsored by Industrial Consultants & Marking Services

3:10 - 4 pm GENERAL SESSION (1 PDH)
  Hazmat Response, Fire Department

Review and Register
- Please take a few moments to review the program, noting items of particular interest to you and which classes or events specify limited seating. These will fill up quickly. Plan to have an alternate choice just in case.
- Register online click on the link below: https://www.eventbrite.com/e/cf-ammonia-refrigeration-regional-tickets-46553358348
  Or, use the registration form on page 4 of this brochure – your payment of $60 per registrant (or $170 per 3 registrants) is required at time of registration.
- Pick up your attendee materials on site.
  All attendees must stop by the Registration Desk at the Embassy Suites Convention Center to pick up their badge and attendee materials.

Registration Desk Hours:
  Sunday, August 26: 1 - 6 pm (exhibitors)
  Monday, August 27: 7 am - 5 pm
  Tuesday, August 28: 7 am - 2 pm

Professional Development Hours (PDH)
Earn up to 13 PDH by attending sessions during the Educational Conference. Be sure to sign in at each session attended. Certificates of attendance will be emailed to all attendees following the event.

Opportunity Drawings
The hosting Chapter (Central Florida) has amassed an assortment of drawing prizes to bestow upon a few lucky attendees. All registrants will be eligible to win. Details available on site.

Weather
Weather in Orlando during this time of year features temperatures in the low 90s during the day and mid 70s in the evening. Chance of rain averages 27%. We recommend layered attire.

Entertainment
Disney World, Universal Studios, Gatorland and Sea World all call Orlando home! Each park is just minutes away from the Embassy Suites. And shuttle service is available to several attractions.

Consider bringing your family for a break and extend your stay.

The reduced hotel rates for RETA are available Thursday, August 23 through Friday, August 31 (based upon room availability)
For more information on things to do in and around Orlando log on to Visit Orlando at: http://visitorlando.com
Central Florida (CF) Ammonia Refrigeration Regional Conference
August 27-28, 2018
Orlando, Florida

REGISTRATION INFORMATION

Register online at:
https://www.eventbrite.com/e/cf-ammonia-refrigeration-regional-tickets-46553358348

OR .... if paying by check, use this form.

Complete Attendee Information (print clearly and legibly and provide one form per registrant)

Please indicate one:
 Attendee
 Exhibitor Booth Staff
 Government Regulator
 First Responder

FIRST NAME (REQUIRED) LAST NAME (REQUIRED) NICKNAME FOR BADGE (REQUIRED)

COMPANY NAME (REQUIRED)

MAILING ADDRESS (REQUIRED)

CITY (REQUIRED) STATE (REQUIRED) ZIP (REQUIRED) COUNTRY

PHONE (REQUIRED) CELL PHONE EMAIL (REQUIRED)

PAYMENT DETAILS AMOUNT ENCLOSED ($60 per registrant or $170 for 3 registrants)

Payment by check (payable in US Funds) — Payable to Central Florida Chapter of RETA

Mail registration form and payment to:
Andy Purvis • CF Chapter of RETA • 33850 Secret Hill Drive • Leesburg, FL 34788

or Bring completed form along with check and register on-site.

The event is held at the Embassy Suites located at 4955 Kyngs Heath Road • Kissimmee, Florida, 34746

The Registration Desk is located in the foyer of the Magnolia Ballroom

ATTENDEE WAIVER

By registering for and participating in the Central Florida (CF) Ammonia Refrigeration Regional Conference (event) you agree to uphold the association’s Code of Conduct; abide by the rules of the event, including but not limited to, event 2018 Exhibitor Rules & Regulations; and grant the Central Florida (CF) Chapter of RETA permission to use photographs (or videos) taken at this event in any and all publications, marketing materials and on the website. Registrant waives any right to inspect or approve the aforementioned use of the image now or in the future. Registrant agrees to release and hold harmless CF Chapter of RETA and show management from and against any claims, damages or liability arising from or related to the use of the images, including but not limited to any distortion, blurring, alteration, optical illusion or use in composite form, either intentionally or otherwise, that may occur or be produced in production of the finished product. Registrant is 18 years of age and competent to contract in own name or that of minor child. Registration for this 2018 CF Chapter of RETA event indicates the attendee/registrant has read this release before registering for this Conference and fully understands the contents, meaning and impact of this release. I understand that I am free to address any specific questions regarding this release by submitting those questions in writing prior to registering for the event, and I agree that my failure to do so will be interpreted as a free and knowledgeable acceptance of the terms of this release. The association’s Code of Conduct and are available on RETA’s website at www.reta.com. The 2018 Exhibitor Rules & Regulations and are available on CF Chapter website at www.reta-cfc.com. I agree and acknowledge that I am participating in the CF Chapter of the Refrigerating Engineers Technicians Association (RETA) hosted event on my own accord. I give this acknowledgement freely and knowingly and I represent and warrant that I am physically and mentally fit and able to participate, and I do hereby assume responsibility for my own well-being. I am fully aware that possible physical injury might occur to me as a result of my participation, including but not limited to injury which may occur as a result of my training on refrigeration equipment. I agree to assume the full risk, including risk which is not specifically foreseeable, of any injuries, including death, damages or loss regardless of severity, which I may sustain as a result of participating in any and all activities connected with or associated with the event. In consideration of the right to participate in the event, I agree to indemnify, defend, and hold harmless and hereby waive any and all rights or claims I may have as a result of participation in the event against the CF Chapter of RETA a Florida not-for-profit corporation that represents refrigerating engineers and technicians, RETA, the show management (Sharlon Wildt Consulting), Embassy Suites and their respective directors, officers, employees, members, staff, and all individuals assisting in instructing and conducting these activities, and I hereby fully release and discharge them from any and all claims resulting from injuries, including death, damages or loss, which may accrue to me or my heirs arising out of or in any way connected with my participation in the event.