COMPLANCE CONNECTION May/June 2018

A bimonthly newsletter designed to help you navigate the ins and outs of compliance and the safe practice of industrial refrigeration.

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 maintainance 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 <u>IIAR Bulletin #110 - Section 4: Records</u>
- 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.





Mark Your Calendar!

August 26-27, 2018 Refrigeration Review Course for RETA Certification Prep Orlando, FL See attached details.

Note: Registration includes attendance of the 2018 Central Florida (Chapter of RETA) Regional Conference.

August 27-28, 2018 2018 Central Florida (CF) Ammonia Refrigeration Regional Conference Orlando, FL See attached details.

Oct. 23-25, 2018 Valve Workshop Chicago, IL See attached details.

For more information about available training and classes, visit www.ammonia.com



Your Compliance Connection* PO Box 833 • Owasso OK 74055 www.ammonia.com

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iidr

VALVE WORKSHOP Oct. 23-25, 2018 Naperville, IL

Industrial Consultants

Your Compliance Connection[®]

TRAINING SCHEDULE AUG - NOV 2018

Click here for more dates available at www.ammonia.com

Bring your Questions! Tools will be provided.

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:

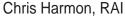
REGISTER

TODAY

www.ammonia.com

HANSEN • PARKER/RS • DANFOSS

INSTRUCTOR





TOPICS COVERED:

- Overview of each valve and valve type
- Function
- Maintenance
- Troubleshooting
- Repair



- 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

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AUGUST 2018

Aug. 26-27 Refrigeration Review Course Orlando, FL

SEPTEMBER 2018

Sept. 18	8-Hour ERT Refresher	Clive, IA
Sept. 19-20	24-Hour Emergency Response	Clive, IA
Sept. 25-27	24-Hour Emergency Response	Plymouth, MN
Sept. 27	8-Hour ERT Refresher	Plymouth, MN
Sept. 28	8-Hour Incident Commander	Plymouth, MN
Sept. 28	8-Hour ERT Refresher	Plymouth, MN

8-Hour ERT Refresher

OCTOBER 2018

Oct.1

Yuma,AZ

		,
Oct. 1-3	24-Hour Emergency Response	Mechanicsburg, PA
Oct. 4	8-Hour ERT Refresher	Mechanicsburg, PA
Oct. 5	8-Hour ERT Refresher	Mechanicsburg, PA
Oct. 23-25	24-Hour Emergency Response	Naperville, IL
Oct. 23-25	Valve Workshop	Naperville, IL
Oct. 23-26	32-Hour Level 1 Refrigeration Operator	Naperville, IL
Oct. 25	8-Hour ERT Refresher	Naperville, IL
Oct. 26	8-Hour Incident Commander	Naperville, IL
Oct. 26	8-Hour ERT Refresher	Naperville, IL

NOVEMBER 2018

Nov. 6-8	24-Hour Emergency Response	Middle River, MD
Nov. 7	8-Hour ERT Refresher	Middle River, MD
Nov. 8	8-Hour ERT Refresher	Middle River, MD
Nov. 12-14	24-Hour Emergency Response	Columbus, OH
Nov. 15	8-Hour ERT Refresher	Columbus, OH
Nov. 16	8-Hour ERT Refresher	Columbus, OH

FOR MORE INFORMATION OR TO REGISTER FOR ANY OF THE CLASSES LISTED ABOVE PLEASE CONTACT US:

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Your Compliance Connection™

2018 REFRIGERATION REVIEW COURSE

August 26-27, 2018 Orlando, FL



Instructor Chris Harmon, RAI Industrial Consultants

This special two-day course is held in conjunction with the Central Florida RETA Chapter Hosted Regional Conference:

Central Florida

Ammonia Refrigeration Regional Conference August 26-27, 2018

Embassy Suites by Hilton Orlando Lake Buena Vista S. Kissimmee, FL

Room Reservations: \$119/night (plus applicable tax)

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).

See Next Page For Full Course Outline

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!

Orlando, FL August 26-27 Click Here

Contact Information

541-497-2955.

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

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)
- Advantages/disadvantages of refrigerants
- Saturated refrigerant table: explanation of each column

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

Lubrication

- Function in a refrigeration system, quality
- Types: splash, force-feed
- Oil and an ammonia system: draining oil and its dangers
- Oil pots, oil stills, oil scrubber
- Oil cooling

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
- Overpressure 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
 - Slop-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 slop-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

Basic design of operation

high stage compressor

pressure equalization

Horsepower savings

Noncondensables

Cascade System

Coil Defrost

Air defrost

Electric defrost

Continuous defrost

cost and efficiency

- Rungs of the ladder

Symbols

Switches

Circuits

Water defrost

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•

Electricity

-

-

- · Pump types for secondary refrigerant
- Heat exchangers:
 - Open tank
 - Shell and tube
 - Plate and frame and its advantages

Compression cycle: booster compressor/

Intercooler function: shell & coil, flash type

Moisture content, pump down, fan delay,

Hot gas defrost operation and guidelines

· Causes for excess of ice buildup

Measurements: horsepower, BTU,

HP/ton, Kilowatt, Kw/ton, Kw demand

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Consultants

Measuring System Performance

Calculation: compression ratio,

Fundamentals: Ladder Diagram

Two Stage System

Central Florida (CF) Ammonia Refrigeration Regional Conference August 27-28, 2018 • Orlando, Florida



REGISTER ONLINE TODAY AT https://www.eventbrite.com/e/cf-ammonia-refrigeration-regional-tickets-46553358348

Details at a Glance

Fees

Attendee Registration

\$60 per person *regardless of RETA member-ship status*.

Fees include opening continental breakfast, daily breaks and box lunch in the Exhibit Hall and Monday evening reception.

Venue

Embassy Suites Orlando Lake Buena Vista South 4955 Kyngs Heath Road Kissimmee, Florida, 34746 Tel: 407-597-4000 Website: https://book.passkey.com/e/49613441 \$119/night (*plus taxes*) sgl/dbl

Reservations

Click here to be connected to the online reservation desk and take advantage of the negotiated group rate.

All reservations must be received by

July 27, 2018 and guaranteed with a credit card or one night's deposit by check or cash.

Exhibition Hours (May be subject to change)

Sunday • August 26	
1 - 6 pm	Exhibitor Move-in
Monday • August 27	
6 - 7 am	Exhibitor Move-in
7 - 8:50 am	Continental Breakfast Hall Open
11:35 am - 1 pm	Box Lunch • Hall Open
3:40 - 5:45 pm	Reception • Hall Open
Tuesday • August 28	}
11:50 am - 1 pm	Box Lunch • Hall Open

11:50 am - 1	1 pm Box Lunch • Hall Open	
1 - 5 pm	Exhibitor Move-out	
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Please note: Exhibit Hall will be locked down during non-show hours.

PROGRAM / AGENDA Program may be subject to change

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 Bennett, 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-Meinert LLC Equipment Săfety Training - Fork Lift Fred Coogle, Fred Coogle Productive Safety **TECHNICAL SESSIONS (1 PDH)** 10:45 - 11:35 am Cooling as a Contact Sport - Jake Farley, CIRO, CARO, Farley's Frigeration 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-Meinert 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 **BOX LUNCH & OPPORTUNITY DRAWING - EXHIBIT HALL OPEN** 11:35 am - 1 pm Lunch Sponsored by FL Smidth 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-Meinert LLC Equipment Safety Training - Scissor Lift Fred Coogle, Fred Coogle Productive Safety

2:40 pm BREAK- Sponsored by Isel & Airgas

Click Here to REGISTER TODAY!

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

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8 - 9:50 am	REGIONAL RUNAMUCKUS (2 PDH) - <i>Industrial Refrigeration Presentation & Trivia Contest</i> 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
How to Prepare a	TECHNICAL SESSIONS (1 PDH) ow Charge Ammonia Systems- Rusty Walker, Hillphoenix nd Survive a PSM / RMP Inspection - Brian Chapin, RC&E act Sport - Jake Farley, CIRO, CARO, Farley's Frigeration
Manufacturer Spec Valve Training (pa Equipment Safety 11 - 11:50 am "Hazmat" What to Intro to Certified H	HANDS-ON TRAINING (2 PDH) Limited seating down - Arlie Farley, CIRO, CARO Sific Workshop - Todd Metsker, Parker-Hannifin; a Division of R/S int 1)- Dan Connelly, Wagner-Meinert LLC Training - Scissor Lift Fred Coogle, Fred Coogle Productive Safety TECHNICAL SESSIONS (1 PDH) De Expect - Michael Chapman, Stellar Refrigeration Energy Specialist (CRES) Why is it necessary?- Jeff Sloan, Wagner-Meinert LLC hy it is Important for Operators - Doug Sweet, Synergy Refrigeration ion 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
Alfa Laval	HANDS-ON TRAINING (1 PDH) Limited seating nger Break-down/Re-assemble Manufacturer-specific Workshop - Danny Hauenstein, tion- Ken Williams, Chemical Transfer
Non-destructive 7	TECHNICAL SESSIONS (1 PDH) <i>f Training Competent Incident Commanders</i> - David Bennett, Industrial Consultants <i>Testing: What Every Operator/Technician Should Know</i> - Jim Kovarik, Gama Graphics Services <i>nd Survive a PSM / RMP Inspection</i> - Brian Chapin, RC&E 1 Hot Point
Valve Training (pa	HANDS-ON TRAINING (2 PDH) <i>Limited seating</i> - <i>down</i> - Arlie Farley, CIRO, CARO, Farley's Frigeration Irt 2) - Dan Connelly, Wagner-Meinert LLC Training - Fork Lift Fred Coogle Fred Coogle Productive Safety
Daily Rounds and	TECHNICAL SESSIONS (1 PDH) lenser Maintenance - Ryan Snyder, Evapco I Troubleshooting, Jeff Sloan, Wagner-Meinert LLC ctiveness and Efficiency; Goal or Reality? - Nate Brink, Polyguard Products
2:10 - 3 pm Plate Heat Excha Alfa Laval	HANDS-ON TRAINING (1 PDH) Limited seating nger Break-down/Re-assemble Manufacturer-specific Workshop - Danny Hauenstein,
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

