

## Industry News

# OPERATING PROCEDURES PART III: CONTROL MEASURES FOR EXPOSURE, QUALITY CONTROL & SPECIAL HAZARDS

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### Stellar expands to China

Stellar, an architecture, engineering, construction and mechanical services firm, has opened an office Shanghai, China and branch offices in both Beijing and Guangzhou. Currently the company has two active projects underway.

### Safety Award

The National Insulation Association (NIA) recently announced the 2011 Theodore H. Brodie Distinguished Safety Award recipients for Contractors. The Brodie Safety Award is the NIA's top industry honor for outstanding safety performance.

Congratulations to RETA member company, Hudson Bay Insulation Company, Seattle, WA, a platinum winner. The Brodie Safety Award, first given in 2004, was created to honor top companies that are proactive when it comes to implementing safe working practices.

### Training Grant

Industrial Consultants LLC recently received a \$5 million grant from the US Labor Department's H-1B Technical Skills Training Grant Competition. The funding is to provide education, training and job

Under the Process Safety Management standard (29 CFR 2910.119), facilities are required to prepare operating procedures (1910.119 (f)) for the safe operations of their ammonia refrigeration system. Specifically, 1910.119 (f) (1) states:

*"The employer shall develop and implement written operating procedures that provide clear instructions for safely conducting activities involved in each covered process consistent with the process safety information..."*

As most already know, this can become a very intimidating task and take many man-hours to write, review, double/triple check, update and maintain. As detailed in the March/April 2012 RETA Breeze article, there are many requirements under 1910.119(f). This article will focus on several items:

**1910.119(f)(1):** SOPs shall address at least the following elements:

#### iii. Safety and Health Considerations:

- A. Properties of, and hazards presented by ammonia.
- B. Precautions necessary to prevent exposure -
  - i. Engineering controls,
  - ii. Administrative controls, and
  - iii. PPE.
- C. Control measures to be taken if physical contact or airborne exposure occurs.
- D. Quality control for raw materials and control of hazardous chemical inventory levels.
- E. Any special or unique hazards.

#### **1910.119(f)(1)(iii)(c): Control measures to be taken if physical contact or airborne exposure occurs.**

The MSDS is a great place to find information on not only the hazards of a chemical, but procedures to take if someone is exposed to it as well. The *Process Safety Information* section of your facility's PSM/RMP program is another valuable resource of information you can consult at any time. Of course, this information is only helpful to you if you are aware of it before you need it.

According to your supplier's MSDS, airborne exposure to anhydrous ammonia can cause throat irritation and at high concentrations (>5,000 ppm) can cause sudden death. The recommended actions to take when airborne exposure occurs are:

1. Move the victim to fresh air (if safe for you to do so).
2. Obtain immediate medical attention.

Physical contact of liquid ammonia with the skin causes freezing due to the low temperatures of the liquid and severe burns due to the strong corrosive nature of ammonia. According to your supplier's MSDS, the recommended response is:

1. Immediately apply water to the exposed areas.
2. Continue to apply water for at least **30 minutes**.
3. Obtain immediate medical attention.

Now you may be asking: *"How can I document this in my SOPs / PSM?"* One easy way to incorporate this in your facility's PSM is to reference the MSDS for ammonia in the Health and Safety section of each written SOP your facility has.

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Continued from page 16

## 1910.119(f)(1)(iii)(d): Quality control for raw materials and control of hazardous chemical inventory levels.

Refrigeration grade ammonia is known as anhydrous ammonia. It must comply with the following criteria: Federal Specification O-A-445B: minimum purity 99.95 percent, may contain a maximum of 500 ppm of water and 5 ppm of oil.

There are several items to consider so that ammonia quality is maintained at refrigerant grade. These include:

**Ammonia supply quality:** How can we verify that the anhydrous ammonia meets specifications?

The ammonia supplier can provide documentation to verify the grade of ammonia.

**Oil quality:** Where can I find out what oil I need to use?

The compressor manual from the manufacturer states the correct oil to use.

**Air leakage:** How can I check to see if air has entered the ammonia system?

One good way to check for contamination is to track and compare the purge count on the auto purger over time. An increase in the purge count typically indicates leakage. Also, if the actual operating pressure on the condenser is greater than 5 psi higher than the saturation pressure should be, this indicates leakage.

**Equipment installation/modification:** What steps should I take to ensure proper modification/installation?

Ensure that standard operating procedures are followed, technicians and welders are properly trained, and that correct materials are used. IIAR Bulletin 107 provides excellent guidance for good engineering practices.

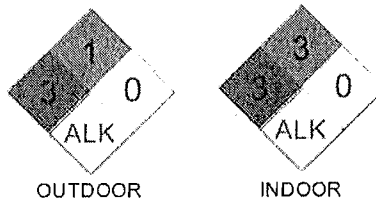
**Line opening:** What is important to keep in mind for line opening?

Technicians performing the line opening should always make sure that the valves and equipment are clean to avoid contamination and that parts are compatible with an ammonia refrigeration system (i.e. no brass fittings).

To incorporate these into your PSM, develop an ammonia quality SOP that covers all aspects of the discussed items.

## 1910.119(f)(1)(iii)(e): Any special or unique hazards.

An important thing to be aware of that is not included in your supplier's MSDS is that the 2012 International Mechanical Code (IMC) requires the NFPA warning for indoor ammonia refrigeration equipment to have a rating of 3-3-0; whereas the NFPA warning for outdoor ammonia refrigeration equipment to have a rating of 3-1-0 as seen in the figure below.



This will be in effect through 2015, at which point IIAR may appeal the flammability rating of "3" for the 2015 IMC. So in the mean time, remember to have the NFPA 3-3-0 diamond on your engine room door.

Bottom line - be familiar with the MSDS for chemicals you could be exposed to, as well as the *Process Safety Information* section of your facility's PSM/RMP program. Safety is everyone's responsibility.

# Industry News

Continued from page 16

placement assistance in high-growth fields and to raise the technical skill levels of American workers. More than \$183 million was awarded to 43 public-private partnerships in 28 states.

## Training Funds Awarded

ARTS Academy, a project of RETA's Monterey Bay Chapter, recently was awarded a state-funded training contract from the Employment Training Panel for \$247,000. Funds are awarded to employers interested in training operators or mechanics in California in areas like basic and intermediate refrigeration, electrical controls, safe work practices, machine operation and good manufacturing practices.

## Company Relocates

Danfoss will relocate its industrial refrigeration final assembly and warehouse operations from Mexico to Morrison, TN later this year. The move is part of company strategy to put important operations in closer proximity to end-users of Danfoss products while taking advantage of expanded warehouse facilities.