Chemical Emergency Prevention & Planning Newsletter

US EPA Region 10 October 2013

Inside This Issue:

- Sorrento
- Ammonia Refrigeration Plant
- Pressure Relief Systems
- Relief Valve Chatter
- References
- RETA 2013

CHEMICAL EMERGENCY PREVENTION & PLANNING
Newsletter

US EPA Region 10,
OCE, OCE-084
1200 6th Avenue, Suite 900
Seattle, Washington 98101

206.553.1255
Fax: 206.553.0124

R10 RMP Webpage

Newsletter Contacts:
*For **RMP**:* Javier Morales at morales.javier@epa.gov

Editor: Peter Phillips at phillips.peter@epa.gov

Co-Editor: Terry Garcia at garcia.terry@epa.gov

*For **SPCC/FRP**: AK: Matt Carr at* carr.matthew@epa.gov

WA OR ID: Michael Sibley at sibley.michael@epa.gov

*For **EPCRA**:* Suzanne Powers at powers.suzanne@epa.gov

*For free **Subscription**:* http://yosemite.epa.gov/R10/airpage.nsf/enforcement/cepp-news

REPORT

CHEMICAL or OIL SPILLS
to the NATIONAL RESPONSE CENTER

1-800-424-8802

Sorrento settles with EPA for chemical management violations at Nampa, Idaho plant

Release Date: July 23, 2013

Contact Information: Cyndi Grafe, EPA Public Affairs, (208) 378-5771, grafe.cyndi@epa.gov

(Nampa, Idaho— July 23, 2013) Sorrento Lactalis, Inc. will pay $91,352 in a settlement for violations of Clean Air Act regulations intended to prevent chemical accidents. The violations occurred at Sorrento's cheese manufacturing facility in Nampa, Idaho.

According to the settlement with the U.S. Environmental Protection Agency, as far back as 2007 Sorrento did not meet risk management requirements such as properly inspecting and testing process equipment, annually certifying operating procedures, and conducting a compliance audit at least every three years. Under the Clean Air Act, facilities that handle large amounts of chemicals are required to develop a risk management program and properly operate and maintain equipment.

"We can't take chances with public health," said Ed Kowalski, director of EPA's enforcement program in Seattle. "Following the risk management regulations is important to prevent chemical releases and protect both workers and the surrounding community."

Sorrento uses more than 10,000 pounds of anhydrous ammonia, a colorless gas commonly used in industrial refrigeration systems. Sorrento has since corrected these violations.

Most accidents with anhydrous ammonia occur from uncontrolled or accidental releases. Exposure to its vapors can cause temporary blindness and eye damage and irritation of the skin, mouth, throat, respiratory tract and mucous membranes. Prolonged exposure to anhydrous ammonia vapor at high concentrations can lead to serious lung damage and even death.

For more information on the Risk Management Program, visit: http://yosemite.epa.gov/r10/airpage.nsf/enforcement/rmp

Ammonia Refrigeration Plant

Chemical Emergency Prevention and Planning

U.S. EPA Region 10, November-December 2008

The toxic, fire and explosion hazards present in refrigeration systems containing ammonia are most likely to be found at cold storage and food distribution warehouses. Hazards apply to the entire system not simply the compressor house.

There have been some explosions involving ammonia. Most of the reported incidents involved ammonia leakage from a refrigeration plant due to poor preventive maintenance.

Pressure Vessels

Potential Hazards:

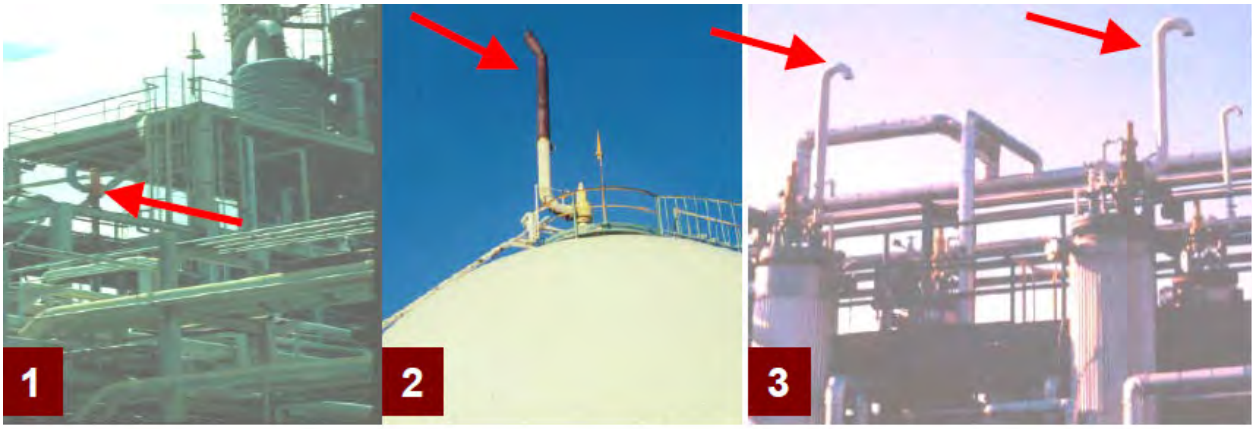
- Release of ammonia as a result of vessel failure due to:
- Improper design and installation (this can include improperly designed relief devices).
- Thermal expansion or contraction.
- Corrosion.
- Overfilling.
- External damage (for example, from a forklift).

Possible Controls:

1. Identify and provide information to facility staff pertaining to the hazards of ammonia.
2. Design and install receiving/storage vessels according to generally accepted good engineering practices. Ensure that Safety Relief Valves and relief systems for storage vessels are properly designed, installed in vapor space, and discharged to a safe location. Place barriers around receiving and storage vessels and other equipment to protect them from impact.
3. Conduct a process hazard analysis.
4. Develop and utilize Operating Procedures to ensure proper operation of vessel(s).
5. Provide training specific to receivers and storage vessels.
6. Conduct pre-startup safety review prior to introducing ammonia when the equipment is new or modified significantly enough to require a change in the process safety information.
7. Routinely inspect the receiving and storage vessel for corrosion as part of a Mechanical Integrity Program. Develop written procedures to manually remove oil from equipment. Maintenance for pressure vessels should include the following tasks performed on a weekly basis (reference: IIAR Bulletin No.110):
    - Check liquid level gauges for oil build up and drain if necessary.
    - Drain oil from vessel (only on vessels where the opportunity for continuous entrance of oil exists). Some systems will be equipped with an automated oil recovery scheme. For those systems it is not necessary to manually drain oil from the various vessels. It is however necessary that you periodically verify that the automated oil recovery system is functioning properly.
    - Inspect vessel and insulation for external appearance and note any departures from normal appearance in the system log. The conditions under insulated portions of the system should be inspected on a periodic basis.
    - Purge vessel of non-condensable gases. For those systems which operate under positive pressure, non-condensable gases are typically introduced during improper maintenance (failure to evacuate after opening the system) or improper charging procedures.
    - Ensure that draining and venting plugs, caps, and blind flanges are in place and closed.
    - Always pressure test any portion of the system opened for maintenance and before evacuation.
8. Issue a hot work permit for hot work operations conducted on or near the storage vessel.
9. Establish and implement written procedures to manage changes to equipment, procedures, and facilities.
10. Investigate incidents and near misses that could have resulted in a release of ammonia.
11. Establish and test an emergency action or emergency response plan in case of release.

Pressure Relief Systems – Do you see any hazards here?

Process Safety Beacon, March 2006



YES there are!

1. The discharge from the relief valve in picture #1 is directed toward a personnel access platform above. If the relief valve opens while someone is working on the platform, that person would be exposed to the discharged material and possibly injured.
2. The relief valve discharge in picture #2 is through a long, unsupported pipe. The force generated by the material flow could bend, break or restrict the discharge pipe, any of which could lead to personnel exposure or a failure of the system to operate as intended.
3. The discharge from the relief valves in picture #3 is directed downward, toward an area where people could be working. As in the first picture, anyone working in this area when a relief valve opens could be injured. The discharge pipes are also long and unsupported as in picture #2.

These pictures illustrate hazards found in many plants which handle chemicals. Relief devices often discharge to a 'convenient' location - and that may not be the same as a 'safe' location!

What You Can Do?

- Relief valves and rupture disks are part of an emergency pressure relief system. Its design must not only prevent equipment overpressure, it must also make certain that material discharged does not lead to personnel injury. The system needs to ensure that there is no fire, explosion, or toxic material exposure hazard from the material released through a relief valve or rupture disk.
- Plant modifications include new platforms, vessels, piping and a variety of other additions. Potential exposure to effluent from existing AND new pressure relief devices must be included in your management of change process.
- Drain, vent and sample valves from equipment or piping as well as vessel overflows can have similar hazards. Any material which could be released from process equipment, including pressure relief valves or rupture disks, must discharge to a safe location.
- ANY open pipe has the potential for an unexpected discharge. The release could occur for a variety of reasons and it will often be a surprise. Use extra caution when working around them - expect the unexpected!

ANY open pipe is a potential chemical discharge!

Have you heard a pressure relief valve chatter?

Process Safety Beacon, April 2013

In the November 2012 Beacon many readers correctly identified one safety issue with the relief valve in the picture at left – potentially closing a block valve, isolating the relief valve so it cannot provide protection against excess pressure. A second possible problem, a piping system which may cause the relief valve to chatter, was not identified by nearly as many people.

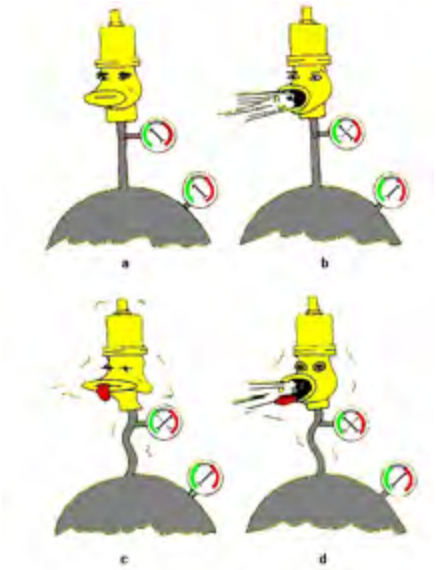
What is "chattering"?

Chattering is the rapid opening and closing of a pressure relief valve. The resulting vibration may cause misalignment, valve seat damage and, if prolonged, can cause mechanical failure of valve internals and associated piping.

Why does a relief valve chatter?

Some causes of chattering include excessive inlet pressure drop, excessive back pressure, an oversized relief valve, and a relief valve which must handle widely varying flow rates. We will explain the first of these in more detail.

Look at the picture above on the right. Under normal process conditions the vessel pressure is below the set pressure of the relief valve, and the pressure at the relief valve is the same as the vessel pressure (a). If a process upset increases the vessel pressure, the pressure at the relief valve increases by the same amount, and if the pressure exceeds the relief valve set pressure the valve opens (b). As soon as the valve opens, flow begins through the pipe to the relief valve, and the flow results in a pressure drop between the vessel and the valve. If this pressure drop is large enough, the pressure at the relief valve can be low enough that the relief valve closes (c). The flow stops, the pressure at the relief valve increases back to the vessel pressure because there is no flow to cause pressure drop, and the relief valve opens again (d)! This happens over and over, and can be very rapid, causing vibration and damage to the relief valve, pipes, and equipment.



What can you do?

- If you observe a relief valve chattering, inform somebody qualified to identify and correct the problem.
- Look for potential problems in relief valve piping design, and ask an engineer to determine if they could cause relief valve chattering.

Some things to look for:

- Inlet pipe to a relief valve which is smaller than the valve inlet (see picture at right)
- Many valves, fittings, and other obstructions between a process vessel and a relief valve, as in the picture above
- A very long pipe between a vessel and relief valve, or piping with a lot of bends
- Evidence of line plugging from corrosion or process materials observed when removing a relief valve for maintenance

Don't let your relief valves chatter!

References for Ammonia Refrigeration Evaluation

An effective process safety management program requires a systematic approach to evaluating the whole chemical process. The following references aid in understanding and complying with the risk management program regulations for ammonia refrigeration.

General Risk Management Program Guidance, Environmental Protection Agency (EPA), (March 2009).

An updated risk management program, which includes an appendix specifically addressing ammonia refrigeration facilities. This appendix replaces the former stand-alone document "Risk Management Program Guidance for Ammonia Refrigeration." This appendix is intended for facilities with ammonia refrigeration systems (e.g., food processors and distributors, refrigerated warehouses). It covers only anhydrous ammonia and provides offsite consequence analyses that are specific to the ways in which ammonia is handled in an ammonia refrigeration system.

Appendix E: Supplemental Risk Management Program Guidance for Ammonia Refrigeration Facilities, Environmental Protection Agency (EPA), (May 2004).

While this guidance is primarily designed to assist with the development and implementation of a risk management plan as required by the EPA, much of the information can also be used by those who are required to comply with the OSHA Process Safety Management Standard (29 CFR 1910.119).

Process Safety Management Guidelines, International Institute of Ammonia Refrigeration (IIAR), (1998).

This guidance provides the interpretation and implementation of the OSHA Process Safety Management Standard. There is a chapter discussing each of the fourteen elements and includes a series of work practices, checklists, and other guidance materials to assist employers in developing a Process Safety Management program.

Please visit the EPA booth (#621) at the upcoming RETA National Conference.

RETA 2013: Building a Sound Foundation

Refrigerating Engineers & Technicians Association

RETA National Conference
October 30 - November 2, 2013
Bellevue, WA

Official Conference Hotel: The Hyatt Regency Bellevue on Seattle's Eastside.

For more information: http://www.reta.com/contact

Where Do I Go For More Information?

RMP Materials EPA's Web site: http://www.epa.gov/emergencies/content/rmp/index.htm includes the Risk Management Program rule, Off-Site Consequence Analysis specific guidance and calculator, the list of regulated substances, fact sheets, guidance documents, industry-specific model plans, FAQs, the RMP*eSubmit Users' Manual, and other information.

EPA RMP Region 10

RMP Coordinator: Javier Morales 206-553-1255

EPA Region 10 RMP Website: http://yosemite.epa.gov/R10/airpage.nsf/Enforcement/rmp

Superfund, TRI, EPCRA, RMP & Oil Information Center - The information center can also answer questions related to Clean Air Act Section 112(r) and RMP reporting requirements. Contact the RCRA, Superfund, and EPCRA Call Center for your policy, regulatory compliance, and reporting requirements questions.

800-424-9346 Toll Free or TDD 800-553-7672 Monday – Thursday: 10:00 AM – 3:00 PM Eastern Time Extended Hours of Operation (May, June and July): Monday – Friday: 9:00 AM – 5:00 PM Eastern Time (Closed Federal Holidays) http://www.epa.gov/superfund/contacts/infocenter/

RMP*eSubmit Software Support Contact the RMP Reporting Center for specific software questions about RMP*eSubmit. (703) 227-7650 (phone) Monday – Friday: 8:00 a.m. – 4:30 PM ET. Closed Federal Holidays RMPRC@epacdx.net (e-mail)

LISTSERVS EPA maintains numerous listservs to keep the public, state and local officials, and industry up to date, including several that pertain to emergency management. You can sign up for our listserve to receive periodic updates:https://lists.epa.gov/read/all_forums/subscribe?name=callcenter_oswer

This newsletter provides information on the EPA Risk Management Program, EPCRA, SPCC/FRP and other issues relating to Accidental Release Prevention Requirements. The articles contained herein are provided for general purposes only. EPA does not accept responsibility for any errors or omissions or results of any actions based upon this information. Please consult the applicable regulations when determining compliance. Mention of trade names, products, or services does not convey, and should not be interpreted as conveying official EPA approval, endorsement, or recommendation. The information should be used as a reference tool, not as a definitive source of compliance information. Compliance regulations are published in 40 CFR Part 68 for CAA Section 112(r) Risk Management Program, 40 CFR Part 355/370 for EPCRA, and 40 CFR Part 112.2 for SPCC/FRP.