

**One Union  
One Voice**



# **Ammonia Refrigeration Safety**

**Process Safety Management**



- <http://www.youtube.com/watch?v=1C5JGpFb0NA&feature=related>



# How Serious is the Problem?

Tyson (US facilities)

Total pounds of ammonia in processes: 6,968,883

Number of deaths from 5-year accidents: 1

Number of injuries from 5-year accidents: 46

Amount of property damage from 5-year accidents:  
**\$1,324,800**



May 14, 2009: American Cold Storage, Louisville, KY  
– 2 fatalities

June 20, 2009: Mountaire Farms, Lumber Bridge,  
NC – 1 fatality

July 15, 2009: Tanner Industries, Swansea, SC – 1  
fatality

November 16, 2009: CF Industries, Rosemount, MN  
– 2 fatalities



# Process Safety Management (PSM)– 13 Elements



# Key Components of Process Safety Management

- Participation by workers and their representatives
- Unlimited access to information
- RAGAGEP
- Extensive Documentation
- Mechanical Integrity
- Management of Change for organizational changes



# (c) Employee Participation

- The program must reflect what really happens in the plant. Workers keep the program real.
- Employers shall consult with workers and their representatives
- All information must be shared



# What does consult mean? (1)

1. The employer should establish a method for informing all employees and their representatives that their process safety concerns and suggestions are welcome. The employer must also establish a mechanism by which it will respond, orally or in writing, to such concerns and suggestions.



**You never  
listen to us!**

You never say anything!





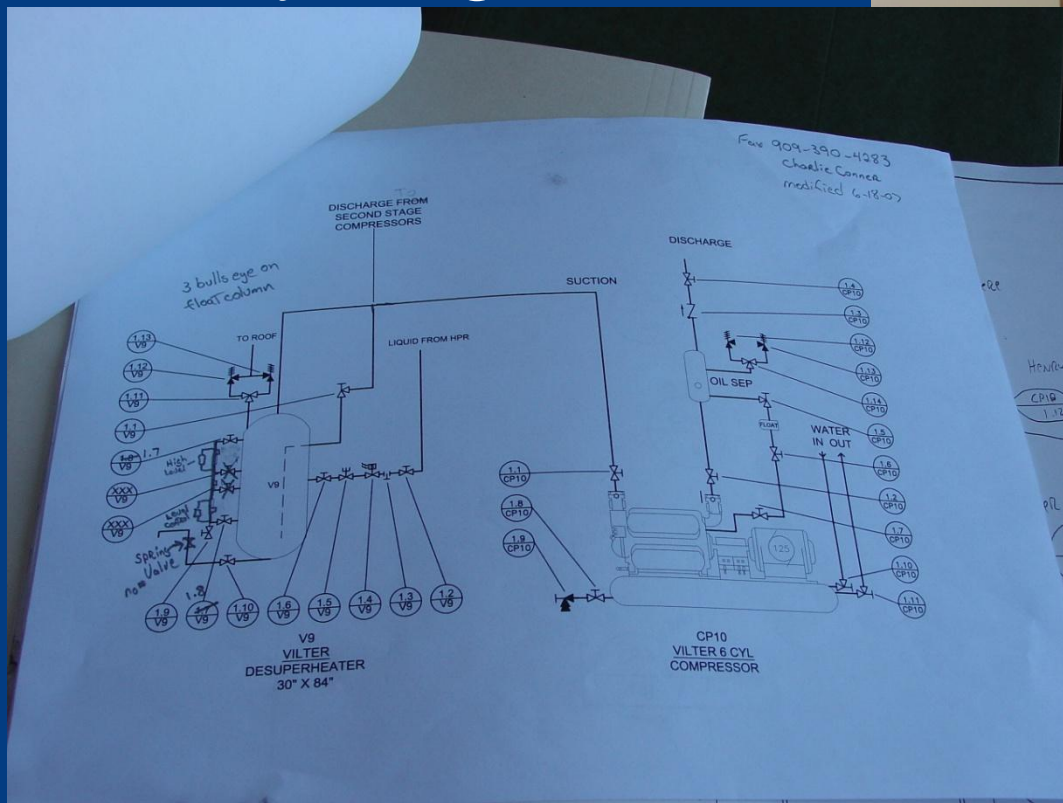
# What does consult mean? (2)

- 2. The employer should affirmatively solicit the suggestions and concerns of employees and their representatives...



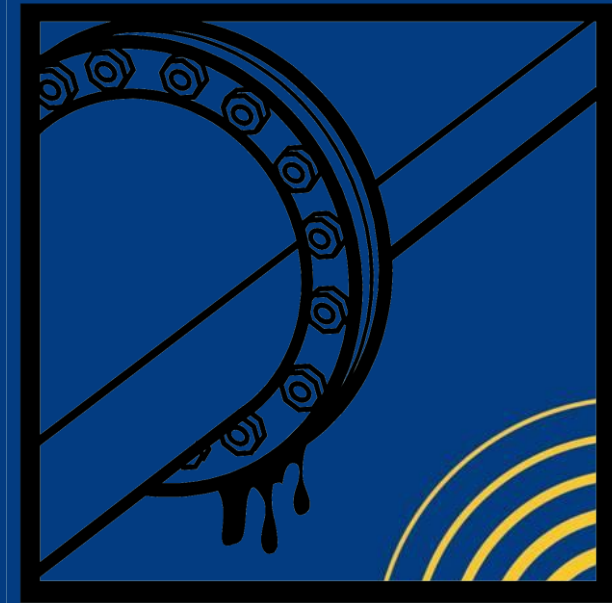
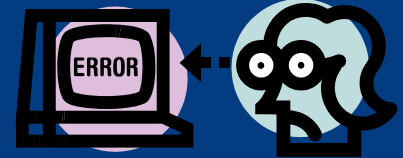
# (d) Process Safety Information

- Everything must be documented
- Everything.



# (e) Process Hazard Analysis

- Every 5 years OR when process is changed
- What bad things could happen?
- What can be done to prevent bad things from happening?
- Action!





# (o) Compliance Audits



# PSM-Required Documentation

- All technical information
- What does the company do?
- How do they do it?
- Who says that's the right way to do it? (RAGAGEP)

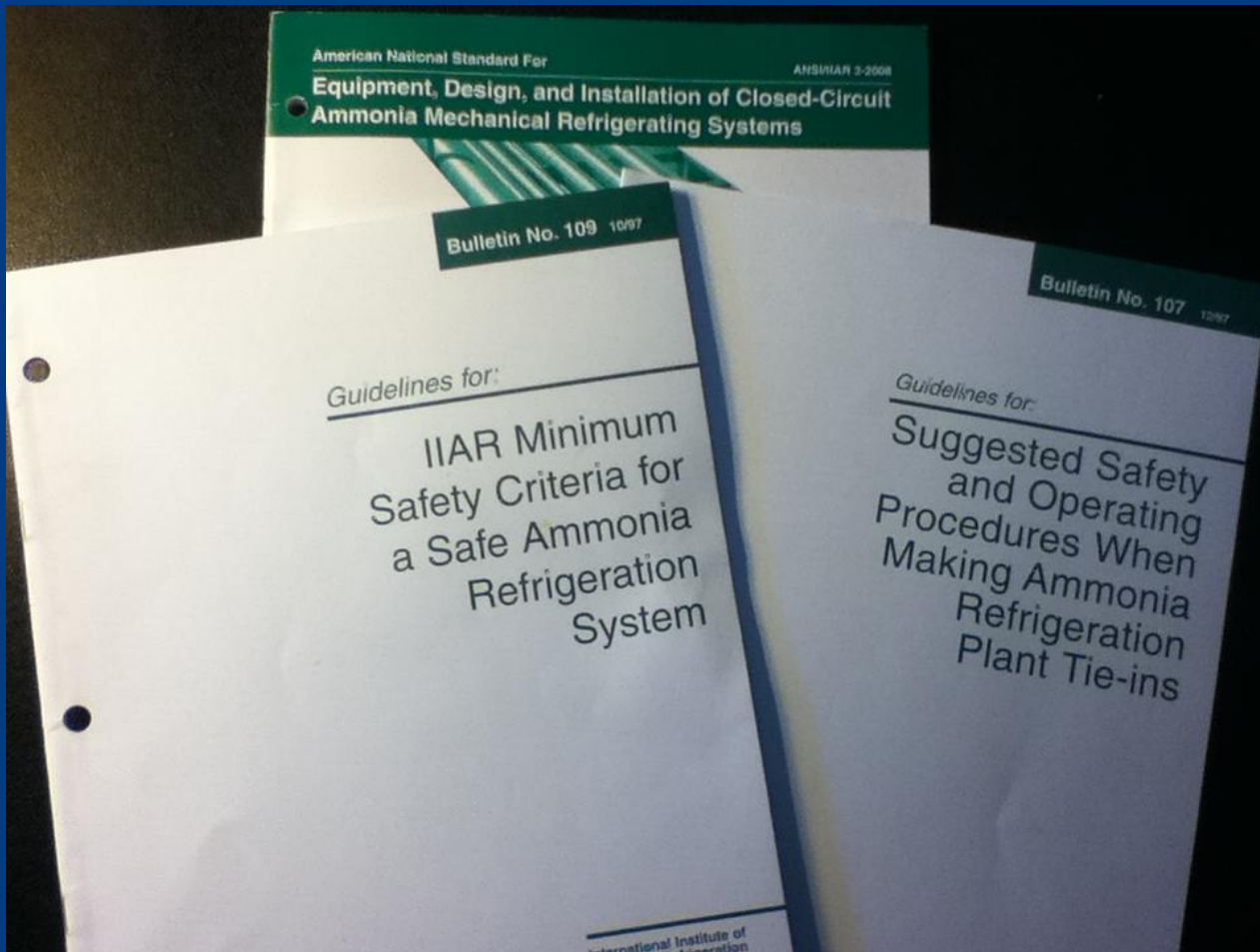


# RAGAGEP

- Recognized and Generally Accepted Good Engineering Practices



# RAGAGEP





# (f) Operating Procedures


- Step-by-step procedures for how tasks are done
- *Is that really how they are done?*

COOK'S HAM  
KANSAS CITY, MO  
MACHINE SPECIFIC LOCKOUT/TAGOUT PROCEDURES

The purpose of this lockout/tagout procedure is to prevent the unexpected release of stored energy or the inadvertent activation of this machine while you or someone else is performing service and/or maintenance. Only employees trained at the Authorized Level can perform lockout/tagout. Failure to follow proper lockout/tagout procedures will result in disciplinary action up to and including termination of employment.

Location:	Engine Room	Machine:	Screw Compressor
Model No.	ALLIS-CHAMBERS 116	Serial No.	FRAME 5884S
Type of Energy:	Electrical	Magnitude of Energy:	480 V
When to use lockout/tagout:	<ul style="list-style-type: none"><li>• When performing service and/or maintenance on the compressor motor.</li><li>• Anytime you place any part of your body in the Danger Zone.</li></ul>		
Lockout Equipment Needed:	<ul style="list-style-type: none"><li>• (1) Lock &amp; Tag</li><li>• Hasp (If more than one-person plans on assisting in the lockout procedure.)</li></ul>		
Residual Energy:	None		
Special Note:	None		

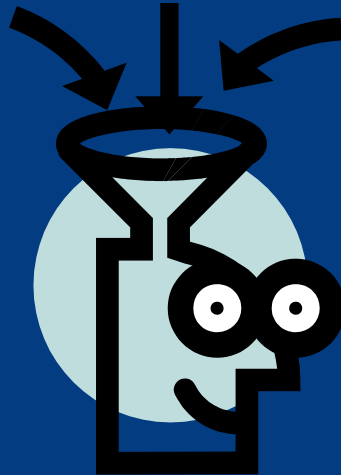
The picture to the left is the Screw Compressor. Follow the procedures below to lock and tagout the compressor motor before performing any service and/or maintenance activities.





# (g) Training

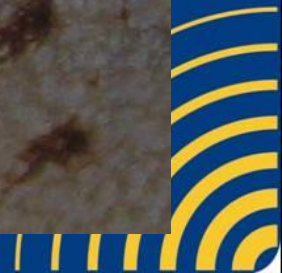
- Train
- Consult with employees about frequency of refresher training
- Document that each employee has received and understood training



# (h) Contractors



# (j) Mechanical Integrity





# Mechanical Integrity

- Every component has a predicted life span.
- Every component is replaced or maintained BEFORE it breaks
- An ammonia leak or a release means the Mechanical Integrity program is inadequate and must be reviewed



# Work Order Backlog: #1 Warning Sign

A huge backlog of work orders is a sign that the Mechanical Integrity (MI) program is not doing what it is intended to, and it may be considered a violation of the performance-based Process Safety Management (PSM) Standard.



# (I) Management of Change

procedures and facilities (29 CFR 1910.119(l)(1)). Some organizational changes, such as changes resulting from mergers, acquisitions, reorganizations, staffing changes, or budget revisions, may affect PSM at the plant level and would therefore trigger a PSM MOC procedure. Some examples of these include:

- personnel changes, including changes in staffing levels, staff experience, or contracting out that directly impact PSM covered processes; and
- policy changes such as budget cutting that impact PSM covered processes.

# (m) Incident Investigation

29 CFR 1910.119(m)(1): The employer did not investigate each incident which resulted in, or could reasonably have resulted in, a catastrophic release of a highly hazardous chemical in the workplace:

Facility - Tyson Foods, Inc. did not investigate each incident resulting in, or which could have reasonably resulted in a release of ammonia from the refrigeration process including, but not limited to:

- a. July 20, 2005 . a release of 74 pounds of ammonia
- b. September 10, 2005 . a release of 3 pounds of ammonia
- c. September 12, 2005 . a release of 8 pounds of ammonia
- d. June 22, 2006, a release of greater than 100 pounds of ammonia
- e. August 13, 2006, a release of 9 pounds of ammonia
- f. August 23, 2007, a release of 22 pounds of ammonia
- g. October 29, 2007 . a release of 504 pounds of ammonia
- h. December 4, 2007, a release of 730 pounds of ammonia
- i. March 10, 2008, a release of ammonia measured at 35 parts per million
- j. March 27, 2008, a release of ammonia measured at 49 parts per million
- k. April 9, 2008, a release of ammonia measured at 39 parts per million
- l. April 13, 2008, a release of ammonia measured at 100 parts per million
- m. April 18, 2008, a release of ammonia measured at greater than 100 parts per million
- n. April 28, 2008, a release of 3,929 pounds of ammonia
- o. May 7, 2008, a release of ammonia measured at 65 parts per million
- p. July 21, 2008, a release of ammonia measured at 30 parts per million
- q. November, 2008, a release of ammonia measured at 35 parts per million
- r. June 28, 2009, a release of 34.7 pounds of ammonia
- s. March 5, 2010 a fire at the Kill Floor could have resulted in an ammonia release
- s. March 6, 2010, a release of ammonia measured at 100 parts per million
- t. March 15, 2010, a release of ammonia measured at 30 parts per million

**Date By Which Violation Must be Abated:**

**12/02/2010**

**Proposed Penalty:**

**\$5,000.00**





# (n) Emergency Planning & Response





# Key Components of Process Safety Management

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- What questions do you have?
- Is ammonia refrigeration a concern in your union?
- Does your industry use other refrigerants?
- Did you work with your government to get safety requirements?
- Do you conduct training on the requirements?

