How are Industry Standards, Engineering Codes, Best Management Practices and Other Measures of Compliance Being Met by Facilities?

More on what we’re seeing at inspections
RMP Facility Chemicals

- Ammonia
- Chlorine
- Flammable Vapors and Liquids
Ammonia Systems

Prescribes requirements for the materials, design, fabrication, assembly, erection, test, and inspection of refrigerant, heat transfer components, and secondary coolant piping.
ASME Boiler and Pressure Vessel Code. (2001)
Provides requirements applicable to the design, fabrication, inspection, testing, and certification of pressure vessels operating at either internal or external pressures exceeding 15 psig. Contains mandatory and non-mandatory appendices detailing supplementary design criteria, nondestructive examination and inspection acceptance standards.
This standard is directed toward the safety of persons and property on or near the premises where refrigeration facilities are located. It includes specifications for fabrication of tight systems but does not address the effects of refrigerant emissions on the environment. For information on the environmental effects of refrigerant

This standard includes standards for the location, design, construction, and operation of anhydrous ammonia systems. Sections on refrigerated storage systems, systems mounted on farm vehicles, tank motor vehicles, and tank railcars for transportation purposes are included. This standard does not apply to ammonia manufacturing plants, or refrigerating or air conditioning systems.

Embraces an IIAR goal of ensuring that ammonia refrigeration systems are engineered, constructed, and operated in a safe manner. Provides detailed list of items to consider when designing, inspecting, or operating a system. Housekeeping, recordkeeping, code considerations and personnel safety equipment are some of the safety issues addressed. Also provides inspection checklist forms for compressors, evaporators, vessels, and heat exchangers to check system installation against recognized industry safety requirements.
IIAR -Bulletin 107 - Guidelines for: Suggested Safety and Operating Procedures when Making Refrigeration Plant Tie-Ins
Addresses the need to approach ammonia refrigeration tie-ins in a safe and methodical manner. Provides owners and contractors with a general checklist of safety and logistical items that should be reviewed when planning system shutdowns and tie-ins. Also provides engineers with on how and where to design for future connections and taps that can make future tie-ins easier and safer.

Offers insights on where the water can come from and how to minimize continued infiltration. Provides an analytical approach to quantifying water concentrations, and recommends apparatus to remove the water.

Embraces an IIAR goal of ensuring that ammonia refrigeration systems are engineered, constructed, and operated in a safe manner. Provides detailed list o items to consider when designing, inspecting, or operating a system. Housekeeping, recordkeeping, code considerations and personnel safety equipment are some of the safety issues addressed. Also provides inspection checklist forms for compressors, evaporators, vessels, and heat exchangers to check system installation against recognized industry safety requirements.
IIAR - Bulletin 110 - Guidelines for: Start-Up, Inspection and Maintenance of Ammonia Mechanical Refrigerating Systems
Covers ammonia characteristics and hazards, inspection and maintenance of equipment, start-up issues, reference standards, safety equipment, and log book record-keeping.
IIAR - Bulletin 111 - Guidelines for: Ammonia Machinery Room Ventilation

Major differences can be found between codes when determining ventilation requirements for ammonia machinery rooms. This bulletin cuts through the jargon and provides a practical ventilation design criteria that will satisfy existing code requirements and improve machinery room safety.
IIAR - Bulletin 112 - Guidelines for: Ammonia Machinery Room Design
Summarizes generally accepted industry practice for ammonia machinery rooms, and references relevant codes and standards where instructive. The recommendations in this guideline are most applicable to completely new ammonia machinery rooms.
IIAR - Bulletin 114 - Guidelines for: Identification of Ammonia Refrigeration Piping and System Components
Provides a comprehensive ammonia labeling scheme for companies in need of an identification system that “covers all”. Offers recommendations on label size, colors, installation locations and label material requirements.
IIAR - Bulletin 116 - Avoiding Component Failure in Industrial Refrigeration Systems Caused by Abnormal Pressure or Shock identifies significant factors that can lead to ammonia refrigeration system damage, personnel injury, trapped liquid, sudden liquid deceleration, and vapor propelled liquid. Also explains the most likely causes or each of these problems and provides design, operation and servicing tips that can minimize the chances of them occurring. Offers numerous suggestions on making hot gas defrost safer and more effective.
Applies to closed circuit mechanical refrigeration systems using ammonia as a refrigerant. Contains information to specify equipment and machinery room design and installation for ammonia mechanical refrigeration systems.
IIAR Ammonia Data Book
Feature resource data essential for the safe and efficient operation of any ammonia refrigeration facility. Contains a chapter on US regulatory requirements for ammonia and other valuable compliance information about federal regulations, such as the Emergency Planning and Community Right to Know Act (EPCRA)
Provides an overview of OSHA’s Process Safety Management (PSM) Standard

EPA/CEPP – Hazards of Ammonia Releases at Ammonia Refrigeration Facilities
The Chlorine Institute publications offer a wide variety of publications geared for the chlorine industry. The following is a list of the pamphlets available for free download:

Pamphlet 1: *Chlorine Basics* (formerly *The Chlorine Manual*)
Pamphlet 5: *Bulk Storage of Liquid Chlorine*
Pamphlet 6: *Piping Systems for Dry Chlorine*
Pamphlet 9: *Chlorine Vaporizing Systems*
Pamphlet 17: *Packaging Plant Safety and Operational Guidelines*
Pamphlet 21: *Nitrogen Trichloride - A Collection of Reports and Papers*
Pamphlet 49: *Recommended Practices for Handling Chlorine Bulk Highway Transports*
Pamphlet 57: *Emergency Shut-Off Systems for Bulk Transfer of Chlorine*
Pamphlet 60: Chlorine Pipelines
Pamphlet 63: First Aid, Medical Management/ Surveillance and Occupational Hygiene Monitoring Practices for Chlorine
Pamphlet 64: Emergency Response Plans for Chlor-Alkali, Sodium Hypochlorite, and Hydrogen Chloride Facilities
Pamphlet 65: Personal Protective Equipment for Chlor-Alkali Chemicals
Pamphlet 66: Recommended Practices for Handling Chlorine Tank Cars
Pamphlet 73: Atmospheric Monitoring Equipment for Chlorine

Pamphlet 74: Guidance on Complying with EPA Requirements Under the Clean Air Act by Estimating the Area Affected by a Chlorine Release

Pamphlet 76: Guidelines for the Safe Motor Vehicular Transportation of Chlorine Cylinder and Ton Containers

Pamphlet 82: Recommendations for Using 100 and 150 Pound Chlorine Cylinders at Swimming Pools

Pamphlet 85: Recommendations for Prevention of Personnel Injuries for Chlorine Production and Use Facilities
Pamphlet 86: *Recommendations to Chlor-Alkali Manufacturing Facilities for the Prevention of Chlorine Releases*

Pamphlet 87: *Recommended Practices for Handling Sodium Hydroxide Solution and Potassium Hydroxide Solution (Caustic) Tank Cars*

Pamphlet 88: *Recommended Practices for Handling Sodium Hydroxide Solution and Potassium Hydroxide Solution (Caustic) Cargo Tanks*

Pamphlet 89: *Chlorine Scrubbing Systems*
Pamphlet 91: Checklist for Chlorine Packaging Plants, Chlorine Distributors, and Tank Car Users of Chlorine
Pamphlet 94: Sodium Hydroxide Solution and Potassium Hydroxide Solution (Caustic): Storage Equipment and Piping Systems
Pamphlet 95: Gaskets for Chlorine Service
Pamphlet 96: Sodium Hypochlorite Manual
Pamphlet 98: Recommended Practices for Handling Hydrochloric Acid in Tank Cars
Pamphlet 99: *Hydrogen Chloride, Anhydrous (Non-Refrigerated) - Use, Handling and Transportation of Cylinders and Tube Trailers*

Pamphlet 121: *Explosive Properties of Gaseous Mixtures Containing Hydrogen and Chlorine*

Pamphlet 139: *Electrical Safety in Chlor-Alkali Cell Facilities*

Pamphlet 150: *Recommended Practices for Handling Hydrochloric Acid in Cargo Tanks*
Pamphlet 152: Safe Handling of Chlorine Containing Nitrogen Trichloride
Pamphlet 155: Water and Wastewater Operators Chlorine Handbook
Pamphlet 160: Estimating the Area Affected by a Hydrogen Chloride Release
Pamphlet 162: Generic Risk Management Plan for Chlorine Packaging Plants and Sodium Hypochlorite Production Facilities
Pamphlet 163: Hydrochloric Acid Storage and Piping Systems
Pamphlet 164: Reactivity and Compatibility of Chlorine and Sodium Hydroxide with Various Materials
Pamphlet 165: Instrumentation for Chlorine Service
Pamphlet 166: Angle Valve Guidelines for Chlorine Bulk Transportation
Pamphlet 167: Learning From Experience
This inspection code covers the in-service inspection, repair, alteration, and rerating activities for pressure vessels and the pressure-relieving devices protecting these vessels. This inspection code applies to all refining and chemical process vessels that have been placed in service unless specifically excluded per 1.2.2.
API 570 - Piping Inspection Code: In-service Inspection, Rating, Repair, and Alteration of Piping Systems-Third Edition

This code covers inspection, rating, repair, and alteration procedures for metallic and fiberglass reinforced plastic (FRP) piping systems and their associated pressure relieving devices that have been placed in service.
This recommended practice (RP) covers the inspection of pressure vessels. It includes a description of the various types of pressure vessels (including pressure vessels with a design pressure below 15 psig) and the standards for their construction and maintenance.
API RP 574 - Inspection Practices for Piping System Components-Third Edition

This recommended practice (RP) supplements API 570 by providing piping inspectors with information that can improve skill and increase basic knowledge and practices.
API 521 – Pressure-relieving and Depressuring Systems
This standard is applicable to pressure-relieving and vapor-depressuring systems. Although intended for use primarily in oil refineries, it is also applicable to petrochemical facilities, gas plants, liquefied natural gas (LNG) facilities and oil and gas production facilities.
API RP 576 – Inspection of Pressure Relieving Devices
This recommended practice (RP) describes the inspection and repair practices for automatic pressure-relieving devices commonly used in the oil and petrochemical industries.
ASME Boiler and Pressure Vessel Code
The International Boiler and Pressure Vessel Code establishes rules of safety governing the design, fabrication, and inspection of boilers and pressure vessels, and nuclear power plant components during constructions.
NFPA 30 - Flammable and Combustible Liquids Code
This code shall apply to the storage, handling, and use of flammable and combustible liquids, including waste liquids.
Chlorine Storage Yard
Chlorine Transport
Chlorine Piping
Chlorine Pipe Labeling
Chlorine Storage Building
Chlorine Detector
Arsenic Sludge Disposal
Condensers on Roof
Condenser Supports
Condenser Support
Ammonia Leak Enclosure
Ammonia Receiver
Relief Valves and Piping
Relief Valves
No Secondary Containment Here
48,000 Lbs of Chlorine RMP?
Valve to No Where
No Labeling
Confined Space
Material?
Watch Your Step!
No Labeling
Relief Valves
Tank Inspection Records
WWTP Entrance
Chlorine
Chlorine Metering
Chlorine Feed Line
Random Drums and Containers
Chemical Residue on Floor
Spilled Substance on Floor
Purchase and Shipping Records
Un labeled Equipment and Pipes
Control Box
Control Box Code
Frozen in Valve Handle
Valve Handle
PSV Discharge
PSV Discharge
Tank Farm
Diesel Fuel Leak on Roof of Family Recreational Building
Unreported Diesel Tank
Ammonia Cylinders in Machinery Room
Underground Wine Cellar
Barrels and More Barrels of Brandy
A picture of Me After Leaving the Area
Largest Wine Tank in the World
1,000,000 Gallons
Contact Information

Mary Wesling
EPCRA §302-312/RMP Enforcement Coordinator
(415) 972-3080
wesling.mary@epa.gov

Robert Lucas
EPCRA/RMP Inspector
415 972-3069
lucas.robert@epa.gov

http://www.epa.gov/emergencies

U.S. EPA Pacific Southwest Region
Emergency Prevention and Preparedness