



EPA Region 7 Planning and Prevention of Ammonia Releases

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GCAP Ammonia Safety Day

June 2018



Agenda

- Keys to accident prevention
- General Duty and Risk Management Program basics
- Learning from accidents and incidents
- Inspections and common findings
- Resources and important safety standards
- Emergency notifications
- Proposed rule changes



Key to Accident Prevention

- Learn from accidents / incidents
 - Including near-miss incidents
- Compare your process to Recognized and Generally Accepted Good Engineering Practices (RAGAGEP)
 - Examples: Standards and bulletins from IIAR/ASHRAE/ANSI/ASTM
 - IIAR Ammonia Refrigeration Management (ARM)



Clean Air Act Amendments of 1990

- General Duty Clause (Section 112(r)(1))
- OSHA Process Safety Management (PSM)
- EPA Risk Management Program (Section 112(r)(7))
- Established Chemical Safety Board (CSB) to investigate incidents



Should I be concerned about CAA 112(r)?

The Clean Air Act applies to ALL ammonia refrigeration facilities

Less than 10,000 pounds

General Duty Requirements
CAA 112(r)(1)

10,000 pounds or more

Risk Management Program
Requirements
CAA 112(r)(7)



Your Facility has a General Duty to

- Identify hazards which may result in releases, using appropriate hazard assessment techniques
- Design and maintain a safe facility, taking steps to prevent releases
- Minimize consequences of accidental releases that do occur
- Coordinate with local emergency responders



Elements of a Risk Management Program

- Management System
- Hazard Assessment
- Prevention Program – Level 2 or 3
- Emergency Response Planning
- Risk Management Plan (RMP)





Risk Management Program vs. OSHA PSM

- PSM and Risk Management Prevention Program Level 3 are essentially the same
- Requirements of the Risk Management Program NOT found in PSM
 - Management system
 - Hazard assessment
 - Emergency response program
 - RMP submittal

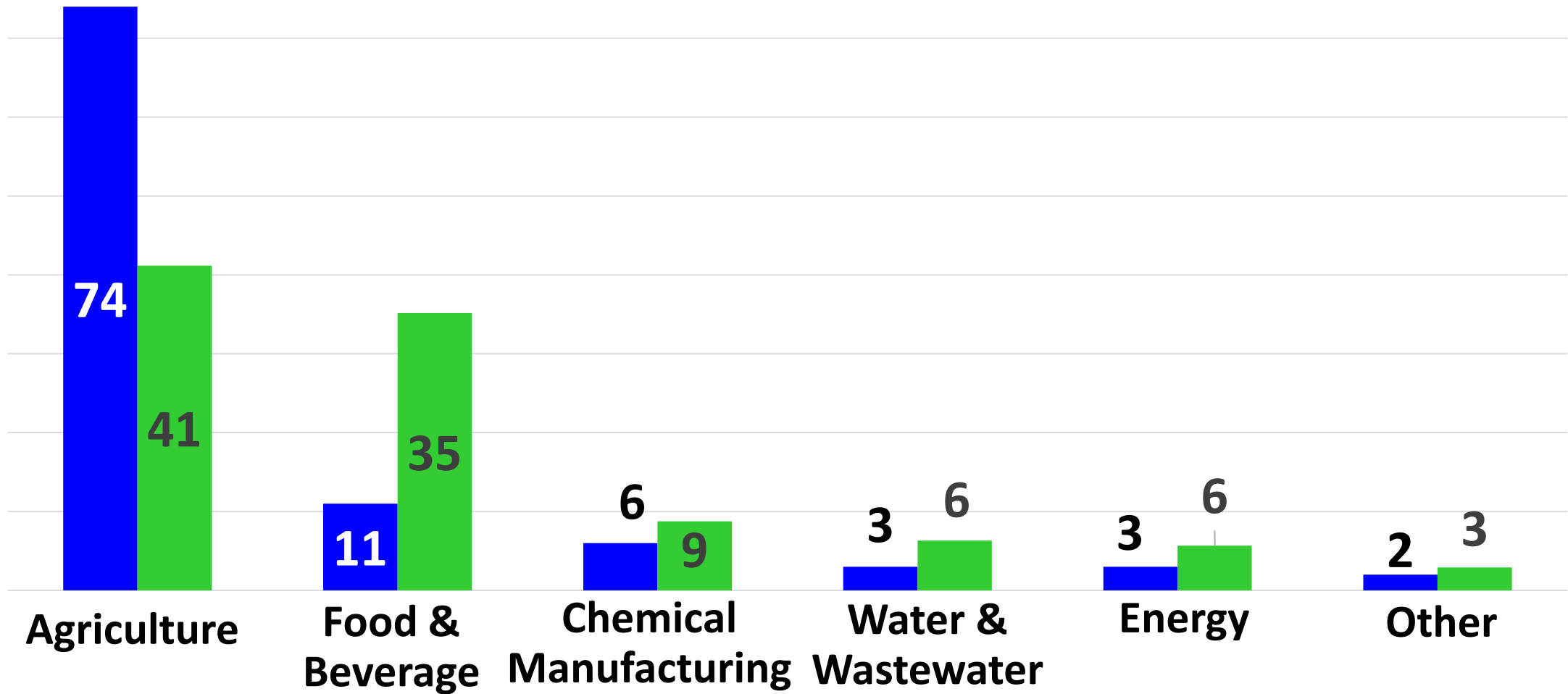
OSHA Term	EPA Term
Highly hazardous chemical	Regulated substance
Employer	Owner or operator
Facility	Stationary source
Standard	Rule or part

	EPCRA 304 / CERCLA 103 Release	CAA 112(r) Accident	CAA 112(r) Incident Investigation
Trigger	Reportable quantity	<ul style="list-style-type: none"> No reportable quantity Involves a regulated substance from a covered process resulting in specified consequences 	<p>Any incident that resulted in or had the potential to result in a catastrophic release. Could include</p> <ul style="list-style-type: none"> EPCRA reportable releases RMP reportable accidents Event where nothing was released
Notes	<p>Call</p> <ul style="list-style-type: none"> Local Emergency Planning Committee State Emergency Response Commission National Response Center 	<p>Considers consequences</p> <ul style="list-style-type: none"> Deaths, injuries, hospitalization, property damage Off-site shelter-in-place, evacuation, environmental damage 	<p>Determine causes and complete follow-up to prevent recurrence</p>
When	Within 15 minutes	Update RMP within 6 months	Start within 48 hours



Region 7 Risk Management Program Facilities and Accidents

% RMPs
% RMP Accidents



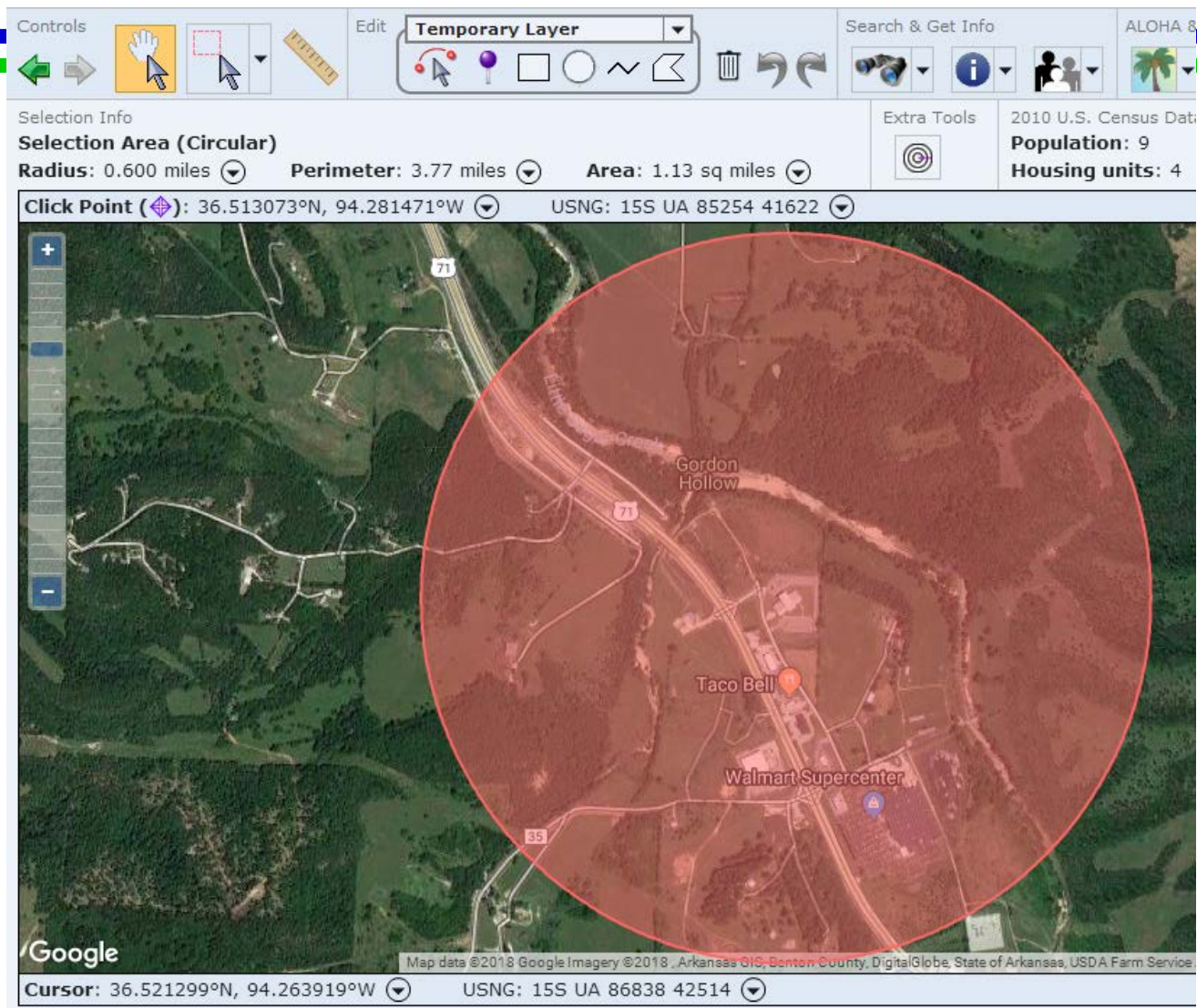


Utilize Your Hazard Assessment

- What accidents and releases have occurred
- What accidents could occur
 - Identify information gaps to add to your safety information
 - Determine what to review during next process hazard analysis so you know how to change the program
 - Implement updated operating procedures, maintenance, training, etc. to prevent a release
- What are the potential release impacts?
 - Sensitive populations
 - Nearby commerce that may need to evacuate or shelter in place
 - Public gathering areas to evacuate/shelter



Offsite Consequence Analysis Example



Release of
10,000 pounds
of ammonia

- Potential Impacts
- *9 residents
 - *Community college
 - *Shopping center

www.epa.gov/rmp/rmpcomp

www.epa.gov/cameo/marplot-software



Learn from Incidents at Other Facilities - U.S. Chemical Safety Board



- Independent federal agency charged with investigating industrial chemical accidents at fixed facilities
 - Inadequate or poor emergency planning/response found as a root cause for 14 incidents
 - Includes investigations at refrigeration facilities
- Does not issue fines or citations
 - Makes recommendations to facilities, regulatory agencies, industry organizations, and labor groups

www.csb.gov



Quick Ways to Be Added to Our Inspection List

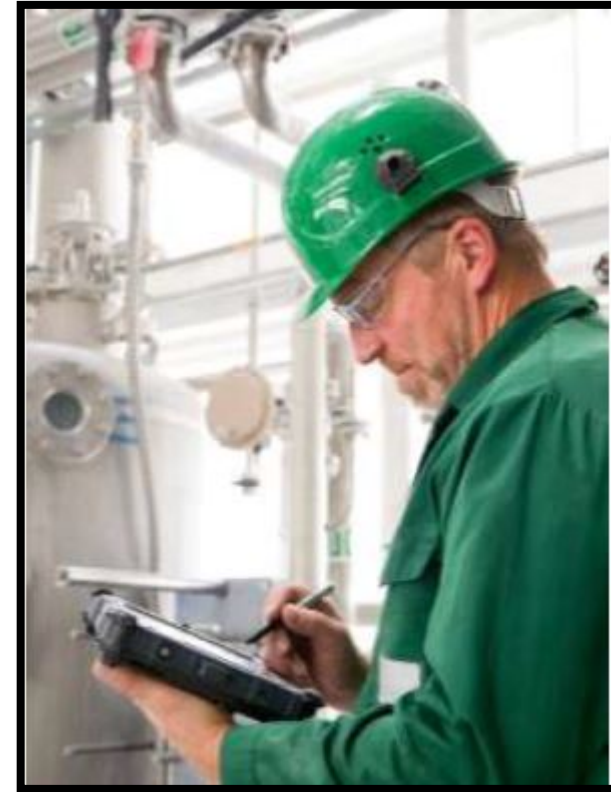
- Have accidents or releases, especially where
 - Several people need treatment or someone dies
 - Public is impacted
 - Significant off-site environmental impact
- Miss a five-year RMP submittal update
- Have >10,000 lbs. ammonia and no RMP
- Deregistered facilities appear active (Google Earth Maps)





Region 7's Our Inspection Process

- Arrival
- Opening Conference
- Document Review
- Facility Walk-Through
- Inspector takes time to make preliminary findings
- Closing Conference



Advanced notification of inspection is **not required**



Common Citations at Refrigeration Facilities

Process Hazard Analysis

- What can go wrong?
 - Failure to consider all chemical physical properties
 - Equipment design limitations and maintenance
 - People – training, human error
- Recognized safeguards should be used
- Evaluate every five years
 - Industry standards
 - Accidents/incidents in past five years
 - Changes to facility AND neighboring area



11% of 140 violations at 26 Region 7 refrigeration facilities inspected 2011-2016 had a PHA violation

Most frequent citation in Region 7



Common Citations at Refrigeration Facilities (cont.)

Compliance Audits

- Not completed every three years
 - Play inspector for a day
 - Consider changes at facility and in industry standards
 - Are you doing what you say you are doing?
 - SOPs
 - Mechanical Integrity
- Not certified

10% of violations cited at Region 7 refrigeration facilities



Common Citations at Refrigeration Facilities (cont.)

Process Safety Information

- Use **current** Safety Data Sheet
- Document maximum inventory, temperatures, pressure, flow, and composition
- Document equipment specifications
- Ensure the process is designed in compliance with recognized and generally accepted good engineering practices (RAGAGEP)

9% of violations cited at Region 7 refrigeration facilities



Risk Management Program Chosen for National Enforcement Initiative (NEI)

- October 2016-September 2019
- Greater emphasis on outreach and enforcement
- Ammonia refrigeration chosen as one of the priority sectors

www.epa.gov/enforcement/national-enforcement-initiative-reducing-risks-accidental-releases-industrial-and



NEI Compliance Assistance Tool

List of On-line Resources for Ammonia Refrigeration Facilities

- Information on EPA accident prevention and EPCRA regulations that apply to refrigeration facilities
- Lists websites with on-line resources from various industry groups and government agencies

www.epa.gov/sites/production/files/2017-11/documents/complianceassistance-ammoniarefrigerationsector0617.pdf





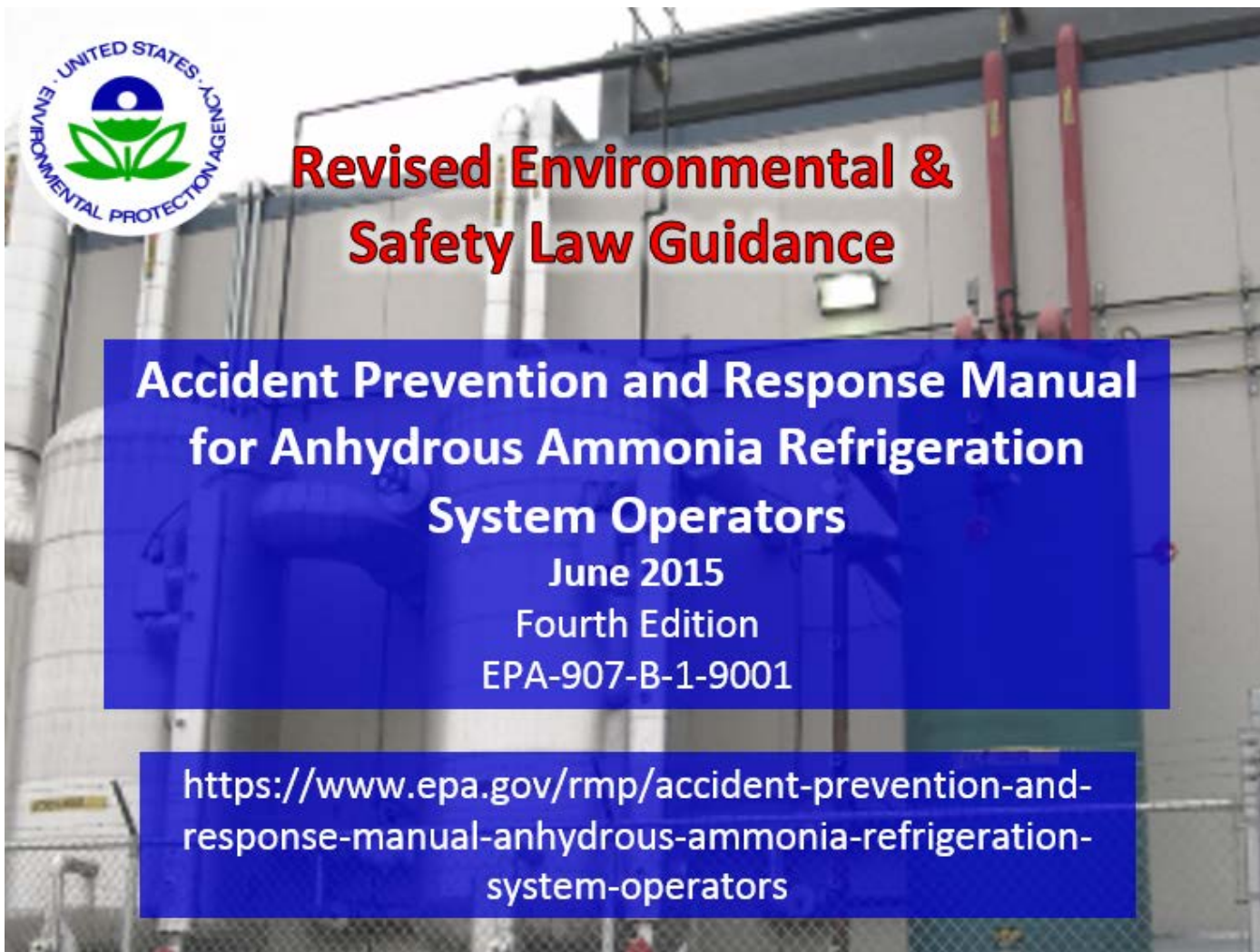
List of Compliance Assistance Tools and Resources (cont.)

EPA's section Includes

- Appendix E: Supplemental Risk Management Program Guidance for Ammonia Refrigeration Facilities
- Enforcement Alert for Anhydrous Ammonia Refrigeration
- General Duty Clause Fact Sheet
- Emergency Planning and Community Right-to-know Act (EPCRA) Homepage
- Consolidated List of Chemicals Subject to EPCRA, CERCLA and CAA 112(r)
- Accident Prevention and Response Manual for Anhydrous Ammonia Refrigeration System Operators



Refrigeration Manual





National Enforcement Initiative Compliance Assistance Tool

List of Important Safety Standards

- Brief list
 - Not an all inclusive
 - Many potentially important RAGAGEP are not on the list
- EPA inspectors/CRO's will be looking at these when working with a facility
- Developed and mutually agreed upon with IIAR



www.epa.gov/sites/production/files/2018-05/documents/listofkeymeasurements.pdf



List of Important Safety Standards (cont.)

Identify Hazards

Have safety deficiencies or releases resulted from

- Failure to identify hazards in design or operation of system
- Failure to complete a process hazard analysis

What if	Hazard	Consequences	Safeguards	Recommendations	Target and Actual dates for completion	Completed by
Drain valve open/leaking on lowest vessel	Potential release of ammonia from leak point	Significant volume of ammonia release into engine room	Log vessel operating parameters every 4 hours. Ammonia alarm starts ventilation fans	Ensure operator monthly checks that caps and plugs are placed on system and protected from damage	First check on July 15, 2015	John Smith
Manual valve closed in pump discharge line	Potential for high pump discharge pressures	Over pressurize system, which could lead to ammonia release in engine room	Pressure regulator (vented back to ultra-low vessel) is in pump discharge line. Logs of pressure every 4 hours	Consider providing a PRV on the discharge of pump	September 23, 2015	Jane Doe
Pump stops (due to mechanical failure or low level switch)	Loss of ammonia flow to evaporators	No safety or environmental consequences (operation issue)	Preventative maintenance program and operator attention during ammonia system operations	No recommendations	N/A	N/A



List of Important Safety Standards (cont.)

Machinery Room and System Design

- Are emergency shut-off and ventilation switches accessible outside each machinery room
- Machinery room ventilation is functional and has been tested
- Air inlets
 - Positioned to avoid recirculation of exhaust air
 - Can sufficiently replace exhausted air
- Pressure Relief Valves are adequately sized

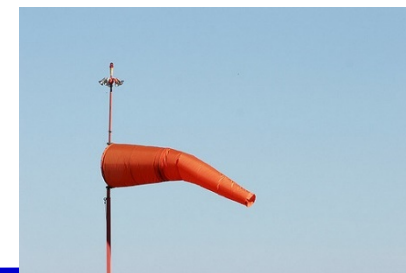




List of Important Safety Standards (cont.)

Emergency Actions

- Accessible critical shutoff valves
 - Location marked on schematic for use by responders
- Up-to date EPCRA Tier II reports submitted to
 - Fire department
 - Local Emergency Planning Committee
 - State Emergency Response Commission

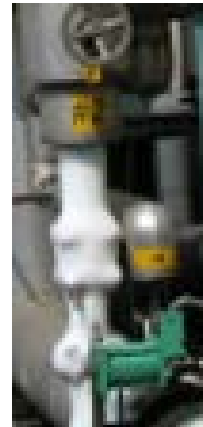




List of Important Safety Standards (cont.)

Maintenance/Mechanical Integrity

- Does preventative maintenance program detect and control
 - Corrosion
 - Deteriorated vapor barriers
 - Ice buildup
 - Pipe hammering
 - Integrity of equipment and pipe supports





List of Important Safety Standards (cont.)

Maintenance/Mechanical Integrity (cont.)

- Are all piping system openings (except the relief header) plugged, capped, or locked (valves)
- Are all pipes, valves, and vessels labeled for easy identification
 - Legible, accessible vessel nameplates
- Replace all atmospheric pressure relief valves every five years





List of Important Safety Standards (cont.)

Operating Activities

- Facility has written operating and maintenance procedures
- Only authorized persons
 - Can access to machinery room
 - Have the ability to alter safety settings
- Oil pots have self-closing/quick closing valves





These Issues Can and Do Lead to Accidents

- Release of 280 pounds of ammonia from winery in September 2012
- Led to evacuations and one employee death
 - Lack of readily available devices designed to prevent a release of ammonia from oil drain lines
 - Inadequate operating procedures and insufficient employee training
 - Pipes and equipment inadequately labeled
- Over \$300,000 in facility improvements and \$330,000 EPA fine

www.epa.gov/newsreleases/us-epa-us-department-justice-finalize-settlement-sanger-calif-winery-over-deadly



Response Capability

- Do the local first responders have the capability to respond?
Your facility has a duty to minimize the consequences of a release
- Utilize Offsite Consequence Analysis in your Hazard Assessment and share with first responders to aid in planning and preparedness
If the local responders do not have the capability to respond your facility must find a way to develop that capability



Make Notifications Simple

- Actual knowledge vs. constructive knowledge
- Who will make calls? Will they be able to provide necessary information?
- Can the LEPC actually respond to the release, and how quickly?

Do NOT have an emergency event be the first time you meet your local emergency responders



40 CFR 68 Rule Modernization Time Line

- July 31, 2014 – EPA requested information from public / regulated community
- November 4, 2015 – Small business advocacy review panel
- March 14, 2016 – Proposed rule published
- January 13, 2017 - Final rule published
 - Original Effective Date: March 14, 2017
- January & March 2017 – Delay of effective date
- April 2017 - Effective date delayed until February 2019
- **May 30, 2018 – Proposed Rule out for public comment**
 - Proposed Effective Date: One year after final rule published
 - Public Hearing for Comments: June 14, 2018



Proposed Major Changes to 40 CFR 68 Includes



- Coordinate annually with local emergency response agencies
- Provide emergency response/action plans and emergency contact information to local emergency response organizations
- Consult with local response officials to establish a schedule for exercises (responding facilities)
- Complete annual notification exercises
- Hold public meeting within 90 days of an accident
- Revisions to Risk Management Plans



Important Notes About Risk Management Program Rule Change



- Compliance dates range from 1 to 7 years after effective date of final rule
 - Compliance with emergency response coordination activities required by one year after the effective date
- Final rule and background
<https://www.epa.gov/rmp/final-amendments-risk-management-program-rmp-rule>
- Questions and answers:
<https://emergencymanagement.zendesk.com/hc/en-us/sections/203878207-Final-Amendments-to-RMP-Rule>



Your Input is Valued



- Public comment period ends July 30, 2018
- Submit written comments and additional materials, identified by docket EPA-HQ-OEM-2015-0725 to the Federal eRulemaking Portal at www.regulations.gov and follow the online instructions for submitting comments
- For more information on this proposed rulemaking, go to www.epa.gov/rmp



You are Invited!

Region 7 LEPC Emergency Planning and Response Conference

Summer 2019

Omaha, NE area

Tracks: Industry, LEPC Basics, Case Studies, Transportation, HAZMAT

Contact Terri Blunk at blunk.terri@epa.gov or 913-551-7013 for more
information





Resources: Chemical Accident Prevention State Coordinators

Iowa: Krystal Stotts; stotts.krystal@epa.gov; (913) 551-7946

Kansas: Fatima Ndiaye; ndiaye.fatimatou@epa.gov; (913) 551-7383

Missouri: Dave Hensley; hensley.dave@epa.gov; (913) 551-7768

Nebraska: Terri Blunk; blunk.terri@epa.gov; (913) 551-7013

Provide compliance assistance for industry, and assist Local Emergency Planning Committees (LEPCs) and the State Emergency Response Commission (SERC) on Clean Air Act 112(r) and EPCRA



Resources: Other Region 7 Federal Contacts

Department of Homeland Security
Chemical Facility Anti-Terrorism Standards (CFATS)

David Martak; David.Martak@HQ.DHS.GOV; 202-617-0984

Department of Labor (DOL) / Occupational Safety and Health
Administration (OSHA)

Brian Drake; drake.brian@osha.gov; 816-502-9011



Resources (cont.)

- EPA EPCRA website: <https://www.epa.gov/epcra>
- EPA Risk Management Program website: <https://www.epa.gov/rmp>
- EPA Emergency Response website:
<https://www.epa.gov/emergency-response>
- The Right-to-Know Network website: <http://www.rtknet.org/db/rmp>

Your Presenter:

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