EPA’s Chemical Risk Management Program

The program requirements, history, and local administration

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Industrial Disasters

- Prior to 1700’s most manufacturing was small scale.
- Industrial revolution
  - Organic chemicals, dyes, drugs, nitroglycerin, etc.
- World War I and II
  - Munitions, lightweight metals, synthetic rubber, polyethylene, fiberglass, plastics, petrochemicals
- 1950’s to present; increased complexity
  - Chemicals, petroleum, nuclear, pharmaceuticals, electric and electronics, aviation, transportation
Industrial Disasters

- 1921- Chemical Works Explosion, Oppau Germany, 561 deaths
- 1942- Chemical Works Explosion, Belgium, >100 deaths
- 1966- Propane Explosion, France, 18 deaths, 81 injured
- 1974- Flixborough Chemical Plant Explosion, England, 28 deaths, 104 injured
- 1984- Mexico City Propane Explosion, 600 deaths, 6000 injured
- 1984- Bhopal Toxic Chemical Leak, India, 2000-10000 deaths, ~200,000 injured
- 1986- Chernobyl Nuclear Meltdown, USSR, 31-7000 deaths
- 1988- Piper Alpha Oil Platform Explosion, North Sea, 167 deaths
- 1989- Pasadena Chemical Plant Explosion, Texas, 23 deaths, 103 injured
- 1994- Dronka Fuel Depot Explosion, Egypt, 410 deaths
- 2000- Enschede Fireworks Depot Explosion, Netherlands, 23 deaths, 947 injuries
- 2001- Toulouse Fertilizer Factory Explosion, France, 29 deaths, >2500 injuries
- 2005- Texas City Refinery Explosion, Texas, 15 deaths, 180 injuries
- 2010- Deepwater Horizon, Gulf of Mexico, 11 deaths
- 2013- West Fertilizer Explosion, Texas, 15 deaths, 200 injuries
Texas City Port Disaster – April 16, 1947

SS Grandcamp 2,220 Tons Ammonium Nitrate
High Flyer 961 Tons Ammonium Nitrate

SSG 2 Ton Anchor 1.62 miles, 10’ Crater
SSG 5 Ton Anchor .5 miles
SSG Steel into the air 6,350 Tons
HF Propeller 1 mile inland

Injured 5000
Homeless 2000
Buildings Destroyed 1000
Dead 581

First ever Class Action Suit against US Govt.
Relevant Laws

- 1986-Emergency Planning and Community Right-to-Know Act – EPCRA
- 1990-Clean Air Act Amendments
- 1994-1996-Risk Management Program
- 1998-U.S. Chemical Safety and Hazard Investigation Board
- 1999-Chemical Safety Information, Site Security and Fuels Regulatory Relief Act
EPCRA

- Enacted after Bhopal, India (1984, MIC, 3,787 dead)
- Provides for local emergency planning and requires industry to provide information.
- Allows public to request and receive info about chemicals and their risks for their community.
- Establishes LEPCs and SERCs which develop emergency response plans, RMP facilities must coordinate their plans with the community plan.
- Facilities must report any release of a Reportable Quantity (RQ) of an EHS to LEPC and SERC. This is in addition to CERCLA required notifications.
- Facilities must report all hazardous chemicals present at the facility in excess of applicable thresholds on Tier I, Tier II or other applicable forms.
Clean Air Act Section 112(r)

- Established the General Duty Clause to require anyone holding EHS to use reasonable care to prevent release and take actions to mitigate a release.
- Required EPA to list chemicals known to cause death or serious adverse effects.
- Required promulgation of rules to prevent, detect and respond to accidental releases of regulated substances.
Local administration

- Air Pollution Control accepted delegation of section 112 of the Clean Air Act after approval of delegation of the Title V air permitting program.
- This was primarily in order to incorporate air toxics rules but included future rules in section 112.
- On April 13, 1999 a Memorandum of Agreement was signed between Louisville Jefferson County Emergency Management Agency and Jefferson County Air Pollution Control.
- The District promulgated the rules, provides administrative support, funding, and enforcement.
- EMA provides technical expertise, compliance assistance, inspects, and responds to incidents.
Local administration benefits

- Increased inspection frequency
- Improved coordination with responders
- More responsive compliance assistance
- Faster return to compliance
Purpose of the Risk Management Rule
The program is designed to prevent accidental chemical releases to air and minimize the consequences of releases that do occur.
Elements and Requirements

A stationary source with a threshold quantity of a listed chemical must register a plan with the EPA and maintain elements of their plan in accordance with the rule.
Elements and Requirements

Three basic elements are required:

- Hazard Assessment
- Prevention Program
- Response Program
Hazard Assessment

- Offsite consequence analysis
  - Worst case
  - Alternate case

- Requires consideration of:
  - Population (residential, institutions, parks, commercial, industrial and offices)
  - Environment
  - Five-year accident history
Understanding Chemical Risk Management

LOUISVILLE/JEFFERSON COUNTY

Part 2

Ammonia

LOUISVILLE WATER COMPANY
Crescent Hill Filter Plant
3018 Frankfort Avenue
Louisville, KY 40206

How to Read a Scenario Map

Endpoint distance - The distance to the point at which chemical concentrations or flammability levels are low enough that effects on the community are no longer expected.

Footprint or plume - Calculations of an area that could be affected by an accidental release. hustle releases generally go in the direction of the wind and may go many miles over several hours, but the effects are usually limited to a "plume-shaped" area. The greater the distance from the release point, the more time there is to take protective action. The effects of flammable releases are limited to an area much closer to the release point, and could affect the "half circle," but are usually over very quickly.

Scenario circle - A circle extending away from the release point to the endpoint distance. Used by local officials for emergency planning.
Hazard Assessment

Alternate Scenario - Ammonia.
Hazard Assessment

Current Map Example
Program Level 1

No public receptors within the distance to an endpoint from a worst-case release

No accidents with specific offsite consequences within the past five years

You get –
Limited hazard assessment requirements and minimal prevention and emergency response requirements.
Program Level 2

Program 1 ineligible or not Program 3

You get;
Streamlined prevention program
Additional hazard assessment
Additional management requirements
Additional emergency response requirements
Program 1 ineligible and either subject to OSHA’s PSM standard under federal or state OSHA programs or classified in one of ten specified North American Industrial Classification System (NAICS) codes.

It imposes OSHA’s PSM standard as the prevention program as well as additional hazard assessment, management, and emergency response requirements.
Prevention Program 3

• Process safety information
  ◦ Enables owner/operator and employees to identify and understand hazards of the process.
  ◦ Information on regulated substances used or produced, technology of the process and equipment used.
Prevention Program 3

- Process hazard analysis
  - Performed by a team with expertise in engineering and process operations and including at least one employee familiar with the process and at least one familiar with the analysis methodology at least every five years.
  - Must establish a system to address findings in a timely manner.
  - Use one of several methods; what-if, checklist, HAZOP, FMEA, etc.
  - Must address; hazards of the process, any previous incident, engineering/administrative controls, human factors, failure of controls, etc.
Prevention Program 3

- Operating procedures
  - Must address all operating phases; startup, normal operations, emergency shutdown, etc.
  - Operating limits; consequences of deviation, steps to correct or avoid deviation
  - Safety and health considerations
    - Shall be readily accessible and maintained as often as necessary and certified up to date annually.
    - Must develop safe work practices to control hazards during LOTO, maintenance work, contractor work, lab work and the like.
Prevention Program 3

Training

- Employees must be trained prior to involvement in a covered process, refresher training must be provided every three years.

- The training must be documented and employee understanding must be verified.
Prevention Program 3

Mechanical integrity

- Must establish written procedures

- Inspections and testing are required to be done in accordance with accepted good engineering practices.

- Frequency is dictated by manufacturer or more frequently if experience dictates.

- Must document the testing and correct any deficiencies before further use or in a safe and timely manner.

- The operator is responsible for making sure the equipment is suitable and installed properly consistent with design specifications.
Prevention Program 3

- Management of change
  - Procedures must be established and implemented to manage changes to process chemicals, technology, and procedures.
  - Consideration must be given to technical basis of the change.
  - Impact of changes on safety and health and operating procedures must be considered.
  - Time to complete the change, and any authorization requirements for the change must be considered along with any training needs.
  - Must update any process safety information or operating procedures as appropriate.
Prevention Program 3

- Pre-Startup review
  - Required when a modification requires a change in process safety information.
  - The review includes confirming that equipment is in accordance with design specifications; safety, operating, maintenance, and emergency procedures are in place and adequate.
  - The review must confirm a PHA has been performed, findings implemented, and training of employees completed prior to startup.
Prevention Program 3

- Compliance Audits

  - Must be performed at least every three years.
  - Evaluate compliance with the regulation.
  - Must document appropriate response to each finding of the audit.
  - The audit must have been performed by at least one person knowledgeable in the process, the last two reports must be retained.
Prevention Program 3

- Incident Investigation
  - Operator shall investigate each incident which resulted in or could reasonably have resulted in a catastrophic release as soon as possible, but not later than 48 hours following the incident.
  - The report must document details of the incident, factors contributing to the incident, and any recommendations resultant.
  - Findings must be promptly addressed and the report must be reviewed with all affected personnel whose job tasks are relevant.
Employee Participation

The operator must address employee participation requirements with a written plan, must consult with employees and their representatives on process hazard analyses and development of process safety management.

Employees shall be provided access to PHA and all other information required under the rule.
Prevention Program 3

Hot work permit

A permit must be issued for hot work performed on or near covered processes.

Fire prevention requirements of OSHA 29 CFR 1910.252(a) must be implemented prior to hot work.
Prevention Program 3

- Contractors

  - Operator is required to *evaluate contractor safety performance and programs prior to selection and on a periodic basis*.

  - Operator is responsible for informing the contractor of hazards and the applicable requirements of the rule.

  - Operator must develop safe work practices to control the entrance, exit and presence of contractors in covered process areas.
Primary differences between Program 2 and 3 are increased requirements for mechanical integrity of Program 3 as opposed to maintenance requirements for Program 2.

Program 2 does not require Pre-startup review, Management of Change, Employee Participation, Hot work permits, or Contractor accountability.
Emergency Response

- Responding and non-responding facilities.

- Non-responding facilities must:
  - Be included in the community emergency response plan;
  - Coordinate response actions with the local fire department.
  - Establish mechanisms to notify emergency responders when necessary.
Emergency Response

- Responding facilities must:
  - Establish and maintain a response plan, including:
    - Procedures for informing the public and local emergency response agencies.
    - Documentation of proper first-aid and emergency medical treatment.
    - Procedures for the use of emergency response equipment (including inspection, testing, and maintenance.)
    - Training for employees in relevant procedures.
    - Procedures to review and update the emergency response plan as needed based on changes to the facility.
    - Procedures to ensure employees are informed of changes.
Common Deficiencies

- Failure to maintain updated emergency contact information with EPA.
- Failure to maintain updated organization chart.
- Failure to record disposition of PHA item resolution.
- Failure to document PHA findings were communicated to affected employees.
- Deficient contractor safety record verification documents.
Common Deficiencies

- Failure to update OCA data promptly after new census becomes available.
- Discrepancies between on-site plan and EPA registration.
- Failure to properly document training.
Future Issues for RMP

- Regulation changes
  - Subsequent to the West, Texas fertilizer plant explosion President Obama issued executive order 13650 to improve safety and security of chemical facilities and reduce the risks of hazardous chemicals to workers and communities.
  - As part of this order the EPA, OSHA and Homeland Security held joint meetings with stakeholders and the public to identify policies and regulations in need of modernization.
Future Issues for RMP

- After a lengthy process of engagement updates to the RMP regulation were proposed.
- Among other changes the EPA proposed to:
  - Increase requirements for coordination with emergency responders;
  - Require companies to conduct a root cause analysis and hold a public meeting after a reportable accident;
  - Cause a third party audit of their plan to be conducted after an incident;
Proposed changes to RMP rule (continued)

- Cause a Safer Technology Alternatives Analysis to be performed every five years as part of the PHA if the company is in NAICS codes for paper, chemical, or petroleum and coal products manufacturing.

- The proposed rule requires all facilities to provide certain basic information to the public upon request and on a company website, social media platform or other publicly accessible forum.
RMP rule changes

The changes proposed in the final rule are to be phased in over a period of four years.

The rule has been delayed twice since the Trump administration took over and will not be effective until February 19, 2019.
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