

National Compliance Initiative: Chemical Accident Risk Reduction

EPA Document #300N21003

November 2021

Risks of Improper Storage of Hazardous Chemicals at Chemical Warehouses and Distribution Facilities

Some chemical warehouse and distribution facilities may be failing to properly manage hazardous chemicals as required by federal law. In the past several years, the EPA has visited numerous chemical warehouses and distribution facilities (i.e., companies that process, formulate, blend, re-package, store, transport, and market chemical products) to determine compliance with the Clean Air Act (CAA) and the Emergency Planning and Community Right to Know Act (EPCRA) requirements. Based on these inspections, EPA found that many facilities are not developing safety precautions; instituting maintenance, monitoring, and employee training measures and preparing risk management plans. EPA has taken enforcement actions and assessed penalties against several chemical warehouses and distribution facilities across the country, sometimes pursuing criminal enforcement actions. This alert reminds chemical warehouse and distribution facilities that they must ensure that their chemicals are managed safely, securely, and in compliance with the federal laws enforced by EPA, Occupational Safety and Health Administration (OSHA), and Department of Homeland Security (DHS).

Regulatory Requirements for Chemical Warehouses and Chemical Distribution Facilities

Complying with environmental regulations will help your facility steer clear of enforcement actions and may help avoid catastrophic chemical accidents. If your facility manufactures, uses, or stores hazardous chemicals, you may be required to comply with federal laws and regulations to ensure that these chemicals are managed safely. Section 112(r)(7) of the Clean Air Act and the implementing regulations at 40 CFR Part 68 Risk Management Program (RMP) require facilities that use certain extremely hazardous substances above a specified quantity in a process to develop a Risk Management Program that includes a hazard assessment (40 CFR Subpart B); a prevention program that includes safety precautions, and maintenance, monitoring, and employee training measures (Subpart C, and Subpart D); and an emergency response program should an accident occur (40 CFR Subpart E).

Section 112(r)(1) of the CAA, the General Duty Clause requires owners and operators of facilities that have any extremely hazardous substances to manage their chemicals safely. Facilities must identify hazards which may result from accidental releases of such substances; design and maintain a safe facility, taking

Case Study: N&D Transportation Company, North Smithfield, RI

An inspection in October 2018 determined that N&D stored substantial quantities of regulated substances in its warehousing operation, including some extremely hazardous substances (EHSs) subject to the CAA and EPCRA. Significant violations alleged by EPA in a 2019 compliance order included: failure to submit a Risk Management Plan for formaldehyde and peracetic acid; failure to conduct a Process Hazard Analysis (PHA) for the warehouse operations and to identify hazards that may result from accidental releases of EHSs; failure to comply with the General Duty Clause (GDC) by, among other things, ensuring incompatible chemicals are not stored together; and failure to submit complete and timely EPCRA chemical inventory reports. Importantly, until the inspection, local and state fire/emergency response authorities appear to have been largely unaware of many EHSs and other chemicals present at N&D's facility which is located near many other businesses and residences. EPA coordinated with OSHA, DHS, and local agencies on this matter. N&D paid a \$314,658 penalty in 2021.



such steps as are necessary to prevent releases; and minimize the consequences of accidental releases that do occur.

EPCRA requires chemical warehouse and distribution facilities to report on the storage, use and releases of hazardous substances to federal, state, and local governments.

In some cases, more than one law applies. For example, ammonium nitrate (AN), which is widely used in farming as fertilizer and stored in chemical warehouses, may be considered extremely hazardous under certain circumstances. Facilities that have AN therefore may be covered by the CAA's GDC requirements. These facilities must also comply with EPCRA section 311 (submit Safety Data Sheets to their State Emergency Response Commission, Local Emergency Planning Committee (LEPC) and local fire department) and EPCRA Section 312 (submit their Hazardous Chemical Inventory forms annually). Failure to manage AN safely has caused some of the world's deadliest explosions including most recently in Beirut, Lebanon in 2020 and in [West, Texas in 2013](#).

Several federal agencies enforce the federal laws governing hazardous chemicals. CAA Section 112(r) and EPCRA Sections 302, 304, 311, 312 and 313 are enforced by the U.S. Environmental Protection Agency; the Process Safety Management (PSM) standard at 29 CFR § 1910.119, is enforced by OSHA; and the Chemical Facility Anti-Terrorism Standards (CFATS) regulation at 6 CFR § 27, is enforced by the DHS Cybersecurity and Infrastructure Security Agency's (CISA) Office of Chemical Security.

Common compliance concerns associated with Chemical Warehouse and Distribution Facilities

During inspections of facilities, EPA frequently finds these common compliance concerns:

- Failure to account for the chemicals in all containers (including aerosol cans, cylinders, storage tanks, etc.) that could be affected by the same emergency event, such as a fire.
- Failure to file and implement an RMP, often because insufficient inventory facility management systems failed to flag that chemical inventories had exceeded regulatory thresholds.
- Failure to include the entire weight of a flammable mixture with a National Fire Protection Association (NFPA) flammability rating of 4 in threshold calculations, not just the amounts of Risk Management Program listed chemicals.

National Compliance Initiative

EPA routinely monitors compliance with accident prevention requirements and takes appropriate action if companies are not meeting their legal obligations to operate in a safe manner. These requirements are also currently the subject of a National Compliance Initiative (NCI). Through the NCI, EPA is increasing its compliance and enforcement activities to ensure companies are reducing the likelihood of chemical accidents and improving the response to accidents that do occur. More information about the NCI can be found at <https://www.epa.gov/enforcement/national-compliance-initiative-reducing-accidental-releases-industrial-and-chemical>.



Chemical drums improperly stacked and some drums under duress.



Insufficient aisle space between chemical drums.

- Failure to submit a Tier II form, Safety Data Sheet (SDS), or TRI Form R, in violation of EPCRA.
- Storage of incompatible chemicals in close proximity to each other, creating a risk of fire, explosion, or release of toxic gases and fumes.
- Storage of flammable chemicals in buildings that are not structurally appropriate for such chemicals or that are not equipped with proper fire protection.
- Inadequate aisle space, hindering access by facility staff or emergency responders in the event of an accidental release.
- Inadequate secondary containment for chemicals to contain spills or leaks.
- Failure to periodically inspect tank systems and ensure their integrity.
- Failure to sufficiently coordinate with local emergency responders; local fire departments had safety concerns about some facilities.
- Failure to complete a CISA CFATS Top-Screen, as well as not utilizing predictive filing to determine all reportable chemicals of interest.



Chemical drums not properly labeled and no secondary containment.

Warren Distribution, Council Bluffs, IA

An inspection in September 2017 determined that Warren Distribution failed to submit a risk management plan while having greater than 10,000 pounds of isobutane, propane, and/or 2,2-Dimethylpropane in a process at its facility. Warren Distribution was also cited for failure to prepare a worst-case scenario analysis.



Case Study: Harcros

Several Facilities Nationwide

In July 2017, Harcros and EPA entered into a global settlement for potential CAA Section 112(r) requirements at the company's facilities nationwide. The consent decree requires the performance of compliance audits at 29 of Harcros' facilities and payment of a \$950,000 penalty. Website:

<https://www.epa.gov/enforcement/harcros-chemicals-inc-clean-air-act-settlement>

Disclosure Opportunities

EPA -- Regulated entities of any size who voluntarily discover, promptly disclose, expeditiously correct, and take steps to prevent recurrence of potential violations may be eligible for a reduction or elimination of any civil penalties that otherwise might apply. Most violations can be disclosed and processed via EPA's automated online "eDisclosure" system. See <https://www.epa.gov/compliance/epas-edisclosure>.

To learn more about the EPA's violation disclosure policies, including conditions for eligibility, please review EPA's Audit Policy website at <https://www.epa.gov/compliance/epas-audit-policy>. Many states also offer incentives for self-policing; please check with the appropriate state agency for more information.

OSHA -- Policy Concerning Treatment of Voluntary Employer Safety and Health Self-Audit
<https://www.osha.gov/laws-regs/federalregister/2000-07-28>

DHS -- Policy for Assessing Civil Penalties Under CFATS
<https://www.cisa.gov/publication/cfats-penalty-policy>

Selected Enforcement Cases

Mann Chemical Company; Warwick, RI

An EPA inspection revealed that Mann Chemical failed to develop and implement an RMP as required by the CAA while storing 92 drums of hydrofluoric acid at a concentration of 70%. Inspectors found numerous other safety deficiencies, including incompatible chemicals stored together, degrading tanks, and lack of proper fire suppression. EPA inspected in 2011 and 2013, ultimately leading to a criminal investigation, in coordination with OSHA, DHS, and local agencies. Mann Chemical pled guilty; paid a \$200,000 fine, was ordered to serve a term of three years' probation and received three compliance orders.



Roberts Chemical Company, Attleboro, MA

EPA determined that Roberts Chemical Company, Inc. failed to develop and implement an RMP while storing 27,467 lbs. of ethyl ether at the company's former facility in Pawtucket. EPA worked with OSHA, DHS, and local agencies to address the violations at the facility, including the issuance of compliance orders. An investigation by EPA's Criminal Investigations Division led to a corporate plea to knowing CAA violations, a \$200,000 criminal fine, three years' probation and a compliance order aimed at changing corporate practices and bringing the company into compliance.



Lessons Learned from Chemical Warehouse EPCRA and CAA 112(r) Cases

Lack of good inventory management leads to RMP and EPCRA violations for having chemicals present over regulatory thresholds.

Inventory management tool should automatically flag chemicals that have reached EPCRA and RMP thresholds

Lack of attention to solutions or mixtures leads to incorrect calculation of threshold quantities for reporting.

To determine if your facility has exceeded a reporting threshold, you need to assess your SDSs and check all applicable federal requirements for regulated substances. When the regulation specifies a concentration for a toxic substance (e.g., nitric acid conc 80% or greater), for the purposes of that regulation, you need only consider solutions/mixtures with concentrations of the regulated toxic substance that are at or above this concentration. You do not need to consider solutions/mixtures with concentrations of a regulated toxic substance below the listed concentration when you determine threshold quantities (however, note that flammable substance mixtures are accounted for differently under the RMP regulation). Once you have determined that the solution/mixture must be accounted for, you need to determine whether the facility exceeds the threshold quantity. For regulated toxics substances, you may have to consider only the weight of the regulated toxic substance in the solution/mixture towards some threshold quantity. Note that PSM, CFATS, EPCRA, RMP and the CAA's General Duty Clause may have different regulatory concentration levels for solutions.

For example, hydrofluoric acid (HF) is the aqueous solution of hydrogen fluoride. HF with a concentration of more than 50% percent of hydrogen fluoride in the solution is a chemical subject to the risk management planning requirements of 40 C.F.R. Part 68, but only if it is present in an amount that exceeds the RMP threshold of 1,000 lbs. Let's say the HF in your warehouse has a 70% concentration of hydrogen fluoride (HF 70%). Because one considers the weight of only the regulated toxic substance to determine whether RMP thresholds are exceeded, one actually needs about 1,429 lbs. of this HF 70% solution to trigger the 1,000 lb. RMP threshold.

Employees need clear information on how to avoid co-location of incompatible chemicals.

Use free chemical reactivity worksheet available at CAMEO chemicals website <http://cameochemicals.noaa.gov> to determine if chemicals are incompatible. Also, it is helpful to have physical markings or barriers at the facility to separate incompatible materials.

Facilities should ensure that their buildings are structurally appropriate for the storage of chemicals and equipped with proper fire protection (e.g., alarms, sprinklers, etc.).

Awareness is needed for when RMP requirements apply.

a. While very similar, EPA's RMP program has some differences from OSHA's PSM program.

For example:

- i. Hydrofluoric acid is not on the OSHA PSM list, but it is an RMP chemical.*
 - ii. The RMP rule, unlike OSHA's PSM standard, does not exempt flammables stored at atmospheric pressure.*
 - iii. There is a much shorter list of flammable liquids subject to RMP than PSM.*
- b. The definition of "process" in 40 C.F.R. § 68.3 states that separate vessels located such that a regulated substance could be involved in a potential release, shall be considered a single process. EPA guidance (reviewed by National Association Chemical Distributors [NACD] before issuance) presumes that storage of a threshold amount of RMP chemical in a single warehouse is usually one "process." Thus, a chemical that is divided up and placed in different parts of the same warehouse may still be stored in the same "process" for purposes of RMP, unless the different storage containers are widely separated such that a release from one container would not lead to a release from another and an external event would not have the potential to release the substance from multiple containers.*

Facilities need to coordinate with local emergency responders.

Some cases involved lack of adequate coordination with emergency responders, and fire departments had serious concerns about conditions at these facilities. Share results from the worst-case, alternative case, and five-year accident history analyses to help responders more fully understand the potential hazards present at your facility.

A maintenance and prevention program for pipes, valves and tanks is needed. The program should include how to achieve appropriate tank integrity and secondary containment. EPA has seen:

- a. Tanks of incompatible chemicals in same secondary containment system;*
- b. Secondary containment insufficient to contain worst-case release;*
- c. Degraded secondary containment (holes, leaks, vegetation growing in it);*
- d. Degraded tanks that threaten to release their contents.*

Facilities need to address the storage of chemicals with appropriate aisle space and segregated incompatible chemicals appropriately.

Makes it very difficult for emergency responders and facility personnel to safely access containers.

More Information

EPA CAA Section 112(r)(7) Risk Management Program

General Risk Management Program Guidance:

<https://www.epa.gov/rmp/guidance-facilities-risk-management-programs-rmp#general>

RMP Fact sheet

https://www.epa.gov/sites/production/files/2020-03/documents/caa112_rmp_factsheet_march_2020_final.pdf

Chemical Warehouse Risk Management Guidance:

<https://www.epa.gov/rmp/guidance-facilities-risk-management-programs-rmp#warehouses>

Chemical Distributors Risk Management Guidance:

<https://www.epa.gov/rmp/guidance-facilities-risk-management-programs-rmp#distributors>

Determining Offsite Consequences of Releases website:

<https://www.epa.gov/rmp/rmp-guidance-offsite-consequence-analysis>

EPA CAA Section 112(r) General Duty Clause

GDC Fact Sheet:

<https://www.epa.gov/rmp/general-duty-clause-fact-sheet>

Guidance for Implementation of the General Duty

Clause: <https://www.epa.gov/enforcement/guidance-implementation-general-duty-clause-clean-air-act-cao-section-112r1-may-2000>

EPA EPCRA Sections 302, 304, 311 & 312

<https://www.epa.gov/epcra>

EPA EPCRA Section 313

<https://www.epa.gov/toxics-release-inventory-tri-program>

OSHA Process Safety Management for Storage Facilities

<https://www.osha.gov/Publications/OSHA3909.pdf>

OSHA Hazard Communication

<https://www.osha.gov/hazcom>

OSHA Chemical Hazards and Toxic Substances

<https://www.osha.gov/chemical-hazards>

CISA Chemical Facility Anti-Terrorism Standards

Fact sheet:

<https://www.cisa.gov/publication/cfats-fact-sheet>

Website:

<https://www.cisa.gov/cfats>

General

On-line tool for understanding the properties and safe handling of thousands of chemicals, including incompatibility with other chemicals:

<http://cameochemicals.noaa.gov>

PSM/RMP Requirements & Threshold Quantities for Each Standard

<https://www.osha.gov/chemical-executive-order/psm-terminology>

Disclaimer

This Enforcement Alert addresses select provisions of EPA regulatory requirements with a focus on the Clean Air Act using plain language. Nothing in this Enforcement Alert is meant to replace or revise any EPA regulatory provision or any other part of the Code of Federal Regulations, the Federal Register or Clean Air Act.