

# Ice Rinks

## EMERGENCY PLANNING AND COMMUNITY RIGHT-TO-KNOW ACT

### REPORTING GUIDANCE



### Refrigeration Systems

U.S. EPA Region 1 has developed this document to assist ice rink owners and operators in communicating effectively with their state and local emergency planners and responders and complying with federal chemical accident prevention regulations. Preventing chemical accidents, including those associated with ammonia refrigeration systems operations, is a national priority for EPA.



*Indoor Ice Arena. Source: Cory Portner, St. Cloud State University*

### What is EPCRA and why is it important?

Congress passed the Emergency Planning and Community Right-To-Know Act (EPCRA) in 1986 to help communities prepare for chemical emergencies. It also requires facility owners and operators to report annually on the presence of hazardous chemicals at their

facilities. In 2018, two ice rinks in New England faced EPCRA reporting violations from EPA and had to pay fines. Failure to follow EPCRA requirements can lead to EPA enforcement penalties; more importantly, not following the requirements can lead to ineffective response to hazardous situations,

which places employees and customers at risk in an emergency. Hazardous chemicals subject to these EPCRA requirements may be found in numerous forms, such as in products, batteries, liquid solutions, solid materials, and other substances.

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## What are the reporting requirements under EPCRA?

EPCRA has four major provisions: emergency planning (Section 302), emergency release notification (Section 304), hazardous chemical inventory reporting requirements (Sections 311-312), and toxic chemical release inventory (Section 313). Generally, Section 313 does not apply to ice rinks. Section 302 requires facilities with Extremely Hazardous Substances (EHS), such as ammonia or sulfuric acid, at or above their threshold planning quantities (TPQs) to notify their State Emergency Response Commission (SERC) and the local emergency planning committee (LEPC) of the chemicals' presence within 60 days of bringing them on-site

for the first time (See 40 C.F.R. Part 355). These facilities must designate a facility emergency coordinator who will participate in the LEPC emergency planning process under Section 303. Under Section 304, a facility must report an accidental release at or above the reportable quantity (RQ) of an EHS or a hazardous substance listed under section 102 of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). In the case of ammonia, for example, a release of 100 pounds or more should be reported to the SERC and the LEPC. Additionally, Section 103 of CERCLA requires reporting of any CERCLA hazardous

substance, such as ammonia to the National Response Center.

Sections 311-312 of EPCRA require facilities storing threshold chemical amounts to submit a Safety Data Sheet (SDS) or a list of hazardous chemicals to state and local emergency responders, and thereafter to submit an annual chemical inventory form. Many states – including all New England states-- require that the comprehensive "Tier 2" form be used for this annual reporting, rather than the shorter Tier 1 form. Learn more about EPCRA requirements here: <https://www.epa.gov/epcra/epcra-fact-sheet>

### Section 302 Emergency Planning

Section 302 requires facilities with Extremely Hazardous Substances (EHS), such as ammonia or sulfuric acid, at or above their threshold planning quantities (TPQs) to notify their State Emergency Response Commission (SERC) and the local emergency planning committee (LEPC) of the chemicals' presence within 60 days of bringing them on-site for the first time (See 40 C.F.R. Part 355).

### EPCRA 304/CERCLA 103 Emergency Release Notification

Under EPCRA section 304 and section 103 of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), a facility must report an accidental release at or above the reportable quantity (RQ) of an EHS or a hazardous substance listed under CERCLA section 102. In the case of ammonia, for example, a release of 100 pounds or more should be reported to the SERC, LEPC, and National Response Center.

### Sections 311-312 Hazardous Chemical Inventory Reporting Requirements

Sections 311-312 of EPCRA require facilities storing threshold chemical amounts to submit a Safety Data Sheet (SDS) or a list of hazardous chemicals to state and local emergency responders, and thereafter to submit an annual chemical inventory form. (see above)

### Section 313 Toxic Chemical Release Inventory

Generally, Section 313 does not apply to ice rinks.

## Tier 2 Reporting under EPCRA Section 312

### What is Tier 2 reporting?

Most ice rinks using ammonia as a refrigerant are subject to EPCRA Tier 2 reporting under Section 312. EPCRA Section 312 requires facilities to submit EPCRA Tier 2 forms by March 1 annually to their SERC, LEPC, and local fire department. Emergency responders use this information to plan, prepare for, prevent, and respond to any chemical emergencies, including spills or releases, at a facility.

Note that EPCRA Tier 2 reporting requirements may not apply to municipally owned and operated rinks in states that do not have an OSHA-approved state plan to protect workers. Find out about your state plan at <https://www.osha.gov/dcsp/osp/index.html>

### Do I need to submit a Tier 2 form?

You need to report if you have a threshold amount of any EHS or hazardous chemical for which facilities are required to have a Safety Data Sheet (SDS) by the Occupational Safety and Health Administration (OSHA).

### The types of hazardous chemicals an ice rink might need to report include, but are not limited to:

- Ammonia (500-pound EHS threshold)
- Non-ammonia refrigerants, such as R-22 or R-134a (10,000-pound threshold)
- Lead Acid Batteries, which contain both sulfuric acid (500-pound EHS threshold) and lead (10,000-pound threshold)
  - ▶ Lead acid batteries can be found in Zamboni® or other ice resurfacing machines, trucks, maintenance equipment, and backup generators.
- Coolants, such as Glycol or Brine solutions (10,000-pound threshold)
- Non-consumer cleaning solutions present in non-consumer form (10,000-pound threshold)
- Sand (10,000-pound threshold)
- De-icer, such as salt or urea (10,000-pound threshold)
- Fuel for a backup generator (10,000-pound threshold), such as:
  - ▶ Propane (approximately 2,500 gallons equals 10,000 pounds)
  - ▶ Diesel or #2 fuel oil (approximately 1,562 gallons equals 10,000 pounds)
  - ▶ There is no reporting requirement for using natural gas through a pipeline.

### Do I have to report for an ice skating rink that is only open for 3 months during a calendar year?

The EPCRA Tier 2 annual reporting requirement is based on how much hazardous chemical you have on-site at any one time during the previous calendar year. You need to submit a Tier 2 form if you have a threshold amount of any hazardous chemical or EHS on-site at any time during the year.

**Be sure to check if your state has lower reporting thresholds than the federal requirements. For example, Vermont has a reporting threshold of 100 pounds for most chemicals.**



## When are Tier 2 forms due?

Tier 2 forms are due annually by **March 1 for the previous calendar year**. Additionally, if you bring a hazardous chemical into your facility for the first time in an amount that meets or exceeds the threshold, and you have never reported that chemical before, you will have to submit an SDS or hazardous chemical list to the LEPC, SERC, and fire department within three months of meeting or exceeding that threshold (alternatively, you may submit a Tier 2 form). See 40 C.F.R. §§ 370.20 - 370.33. This is a one-time reporting requirement to make sure the emergency response and planning agencies have timely information about the new presence of hazardous chemicals at your facility. Please check with your state for the preferred method.

## How do I submit my annual Tier 2 form?

The owner or operator of the ice rink must submit the required Tier 2 form to the State Emergency Response Commission (SERC), Local Emergency Planning Committee (LEPC), and local fire department. All New England states require electronic reporting. However, some LEPCs and fire departments may request a hard copy. Find online reporting software and information at these links:

**Tier2 Submit™ software:** <https://www.epa.gov/epcra/tier2-submit-software>

**EPCRA Tier 2 reporting information:** <https://www.epa.gov/epcra/epcra-sections-311-312>

**State Tier 2 reporting requirements and procedures:** <https://www.epa.gov/epcra/state-tier-ii-reporting-requirements-and-procedures>

### For more information:

EPCRA, RMP and Oil Information center: 800-424-9346

EPCRA fact sheet: <https://www.epa.gov/epcra/epcra-fact-sheet>

EPA List of Lists: [https://www.epa.gov/sites/production/files/2015-03/documents/list\\_of\\_lists.pdf](https://www.epa.gov/sites/production/files/2015-03/documents/list_of_lists.pdf)

EPCRA Hazardous Chemical Reporting regulations: 40 C.F.R. Part 370 <https://www.gpo.gov/fdsys/pkg/CFR-2017-title40-vol30/pdf/CFR-2017-title40-vol30-part370.pdf>

EPCRA information on Extremely Hazardous Substances: <https://www.epa.gov/epcra/final-rule-extremely-hazardous-substance-list-and-threshold-planning-quantities-emergency>

Attend an EPA EPCRA Tier 2 training in New England: <https://www.epa.gov/epcra/emergency-planning-and-community-right-know-act-epcra-workshops-new-england>

If you have questions, please contact the EPA Region 1 office email at: [R1assist@epa.gov](mailto:R1assist@epa.gov)

*This document is intended for regulatory guidance only and should not be substituted for a thorough review of existing federal regulations. Be sure to review your state and local requirements as well as the federal requirements discussed in this factsheet.*



# Ammonia

## SAFETY IN NEW ENGLAND ICE RINKS



### Recommendations for Ice Rink Operators with Ammonia Refrigeration Systems

U.S. EPA New England has developed this document to assist ice rink owners and operators with ammonia refrigeration systems in communicating effectively with their employees, contractors, vendors, and customers about ammonia refrigeration safety. Helping facilities to minimize the risk of potential chemical releases, such as an accidental release of ammonia at a refrigeration facility, is a national priority for U.S. EPA.



#### What is ammonia?

Anhydrous ammonia is a toxic gas recognizable by its pungent odor. Anhydrous ammonia compressed into a liquid form is commonly used in mechanical refrigeration systems for indoor ice rinks and other facilities. It becomes a gas when released into the ambient air.

#### How does ammonia relate to ice rinks?

Ammonia refrigeration is an economically and environmentally efficient option for ice rinks and other refrigeration facilities. Of the many types of refrigeration systems used in the U.S.,

ammonia is one of the most energy-efficient. Unlike some refrigerants, ammonia does not cause damage to the ozone layer.

Some ice rink facilities that use R-22 refrigeration systems are switching to ammonia. In 2020, the U.S. will cease production and import of chlorofluorocarbons (CFCs) such as R-22 (also called HCFC-22) to reduce negative impacts on the ozone layer. This will lead to a decrease in the supply of R-22.

#### What are the risks of ammonia exposure?

While there are many benefits to an ammonia-based refrigeration system, there are

also potential risks to health and safety if the ammonia is not properly managed and contained. When released as a gas, ammonia is a severe irritant to the eyes, nose, and throat. Exposure can cause headaches, coughing, difficulty breathing, and impaired vision.

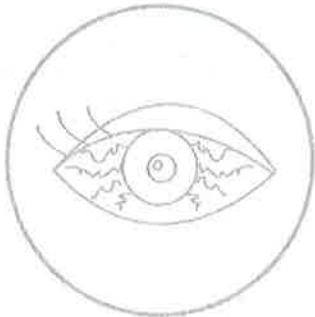
Prolonged exposure to high concentrations of ammonia can lead to asthma, blindness, and pulmonary edema (fluid in the lungs), which can be fatal. Skin contact with liquid ammonia can cause burns, blisters, and frostbite, as well as blindness or eye damage. Ammonia gas can also be flammable or explosive when  
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released into the air at high concentrations, which is why it is important to have a well-ventilated machine room.

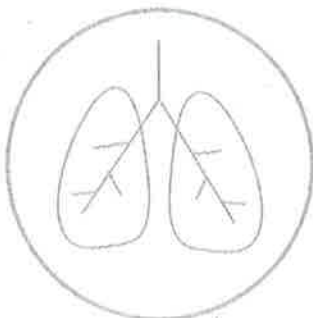
Proper maintenance and management of ammonia refrigeration systems can prevent a system failure or leak from occurring, reducing the risk of exposure. Ice rink staff should also be trained to recognize ammonia's pungent odor, which could indicate a leak.



headache



irritated eyes



difficulty breathing

## What are the requirements for refrigeration systems in ice rinks?

Anhydrous ammonia is an extremely hazardous substance regulated under the Clean Air Act (CAA) and the Emergency Planning and Community Right-to-Know Act (EPCRA). CAA Section 112(r)(1), the General Duty Clause, requires facility owners and operators to ensure safe management of any extremely hazardous chemicals handled or stored onsite, including ammonia. Rinks with more than 10,000 pounds of ammonia must prepare a Risk Management Plan (RMP), and can learn more at <https://www.epa.gov/rmp>.

Industry codes and guidelines help EPA and facilities understand the standards of care for facilities with ammonia refrigeration systems. The International Institute of Ammonia Refrigeration (IIAR) and the American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE) have issued guidelines and standards for safe installation, use, and maintenance of ammonia refrigeration equipment through the American National Standards Institute (e.g. ANSI/IIAR Standard 2 and ANSI/ASHRAE Standard 15, respectively).

EPCRA requires facilities to report information about hazardous chemicals to emergency planners and responders. EPCRA Section 302 requires rinks to report the presence of any extremely

hazardous substances listed at 40 C.F.R. Part 355, including ammonia, to the state emergency response commission. Also, Section 312 of EPCRA requires some rinks to report annually on the presence of chemicals in order to aid local emergency response planning. Ice skating rinks and other facilities are required to submit an annual chemical inventory report to the state, local emergency planning committee, and fire department if they have on-site extremely hazardous substances (EHSs), including ammonia, or other hazardous chemicals. The threshold for ammonia is 500 pounds; thresholds may vary for different substances. Note that EPCRA's annual chemical inventory requirements may not apply to municipally-owned and operated rinks in states that do not have an OSHA-approved state plan to protect workers.

Facilities and operations also must be in compliance with applicable OSHA requirements (such as regulations at 29 C.F.R. § 1910.111 pertaining to the storage and handling of anhydrous ammonia), as well as state fire and safety codes. Ammonia tanks must be registered with the State under the National Board Inspector Code (NBIC) operated by the National Board of Boiler and Pressure Vessel Inspectors.





A chiller in an ammonia refrigeration system. *Image Source: Stevens Engineers*

## How can you protect your customers, workers, and self from ammonia exposure?

### 1) Complete a Process Hazard Review

The General Duty Clause of the Clean Air Act requires facilities to identify hazards which may result from the accidental release of ammonia or other hazardous substances using appropriate hazard assessment techniques. Facility staff should be aware of the risks and potential impacts of ammonia exposure, as well as the

hazards associated with their refrigeration systems. Facilities may use industry checklists to conduct this hazard review, provided they account for site-specific conditions.

### 2) Maintenance

All facilities should have a preventative maintenance program in place for all equipment based on the equipment manufacturers' recommendations and industry standards of care. This program will ensure and document regular system maintenance, routine checks for ammonia system leaks, provisions on hand

for emergency repairs, safe procedures for oil removal, and start-up/shut-down procedures for seasonal facilities. Staff should continue to monitor and maintain ammonia systems and other facility equipment even while the facility is closed for the season.

### 3) Ventilation and Detection System

All facilities utilizing an ammonia refrigeration system should have an ammonia detection system installed in the machine room that will detect an ammonia leak and trigger an alarm and independent ventilation system.

IIAR has issued standards that outline specific ammonia system requirements, including provisions for these systems.

#### 4) Plan for Emergencies

All facilities that use an ammonia refrigeration system should have an emergency plan in place. This plan should include evacuation procedures, locations of safety showers and eye wash stations, phone numbers for medical and local emergency responders, operating procedures for emergency shut-down of facilities and off-season monitoring, and any other pertinent information that may be required in the case of an ammonia leak. Emergency phone-numbers and operating procedures need to be publicly posted and visible. Facilities should report the presence of all hazardous chemicals above certain thresholds annually through the State's EPCRA reporting system to aid local fire departments in their own emergency response plans. In case of an accidental release of ammonia, immediately notify the State, and the National Response Center and 911 that an incident has occurred.

#### For more information:

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#### Online Resources:

**Ammonia Refrigeration List of Key Safety Measures.** EPA May 2018. <https://www.epa.gov/enforcement/safety-standards-ammonia-refrigeration>

**Application of Climate-Friendly Ice Rink Technologies: Brooklyn Park Community Activity Center.** EPA July 2015. [https://www.epa.gov/sites/production/files/2015-07/documents/application\\_of\\_climate-friendly\\_ice\\_rink\\_technologies\\_brooklyn\\_park\\_community\\_activity\\_center.pdf](https://www.epa.gov/sites/production/files/2015-07/documents/application_of_climate-friendly_ice_rink_technologies_brooklyn_park_community_activity_center.pdf)

**Compliance Assistance Tools and Resources for the Ammonia Refrigeration Sector.** EPA June 2017. <https://www.epa.gov/enforcement/compliance-assistance-tools-and-resources-ammonia-refrigeration-sector>

**Emergency Planning and Community Right to Know Act (EPCRA)**  
<https://www.epa.gov/epcra>

**Enforcement Alert: EPA Enforcement Efforts Focus on Prevention of Chemical Accidents.** EPA February 2015. <https://www.epa.gov/enforcement/enforcement-alert-epa-enforcement-efforts-focus-prevention-chemical-accidents>

**Guidance for Implementation of the General Duty Clause: Clean Air Act (CAA) Section 112(r)(1).** EPA May 2000. <https://www.epa.gov/enforcement/guidance-implementation-general-duty-clause-clean-air-act-caa-section-112r1-may-2000>

**Ice Rinks and the Phaseout of HCFC-22.** EPA July 2015. <https://www.epa.gov/ods-phaseout/ice-rinks-and-phaseout-hcfc-22>

*This document is intended for regulatory guidance only, and should not be substituted for a thorough review of existing federal regulations. Please note that state and local regulations regarding ammonia and other toxic substances may be more stringent than federal regulations. Threshold amounts for reporting an accidental release of ammonia vary by state. Be sure to review your state and local requirements as well as the federal requirements discussed in this factsheet.*



## **Compliance Assurance and Enforcement Focus: Improving Safety at Facilities in New England with Smaller Ammonia Refrigeration Systems**

### **Ammonia: An Efficient Refrigerant That Must Be Safely Managed**

While anhydrous ammonia has many environmental and operational benefits, it is also an extremely hazardous substance that, if accidentally released, presents a significant health hazard because it is corrosive to the skin, eyes, and lungs. Ammonia is also flammable at certain concentrations in air.



*EPA inspection photo reveals dangerous ice buildup on ammonia piping and valves.*

### **How Safe Is Your Refrigeration System?**

Accidental releases of ammonia from refrigeration facilities have injured or killed people. See <https://www.epa.gov/sites/production/files/2015-02/documents/112renforcementalert.pdf>

Some of the most dangerous facilities that EPA inspected were not aware of the hazards that their refrigeration systems posed to the public, emergency responders, and employees.

### **Does Your Facility Use Ammonia Refrigeration?**

The Environmental Protection Agency (EPA) would like to work with facilities that have ammonia refrigeration systems to improve their safety, protect workers and the public from exposure to toxic gas, and avoid product losses.

### **Notice of Compliance Assurance and Enforcement Initiative**

**EPA is providing advance notice of an upcoming enforcement initiative so that you can take steps now to avoid a penalty before the initiative begins.**

The Initiative will focus on ammonia refrigeration facilities using fewer than 10,000 pounds of anhydrous ammonia to enhance their compliance with the General Duty Clause of Section 112(r) of the Clean Air Act ("CAA"), 42 U.S.C. §(r)(1), and with Section 312 of the Emergency Planning and Community Right-to-Know Act (EPCRA), 42 U.S.C. § 11022. Failure to comply with these requirements puts the public at risk of exposure to anhydrous ammonia.

### **Compliance Help**

Go to <https://www.epa.gov/enforcement/compliance-assistance-tools-and-resources-ammonia-refrigeration-sector> for a list of compliance resources, including guidance documents and links to refrigeration-related trade associations.

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## How Can I Comply With The General Duty Clause (GDC)?

The goal of Section 112(r) of the Clean Air Act, 42 U.S.C. § 7412(r), is to reduce the risk of chemical accidents. Owners and operators of stationary sources producing, processing, handling, or storing extremely hazardous substances, including anhydrous ammonia, must:

1. identify hazards which may result from accidental releases using appropriate hazard assessment techniques;
2. design and maintain a safe facility taking steps to prevent releases; and
3. minimize the consequences of accidental releases that do occur.

For more information on the General Duty Clause: <https://www.epa.gov/sites/production/files/documents/gendutyclause-rpt.pdf>.

**This Initiative focuses on the first duty listed above.** Conduct a comprehensive hazard review of your refrigeration system to comply with the duty to identify hazards. Appropriate hazard identification techniques include standard industry checklists and What-if analyses. See above link for more information. Trade associations may be able to help you find experienced consultants and hazard identification materials.

## How will EPA's Initiative Work?

**Information Request:** EPA has begun preliminary investigations into compliance with the General Duty Clause by facilities that it believes has fewer than 10,000 pounds of ammonia. The primary focus of this Initiative is facilities with more than 1,000 pounds of ammonia. EPA will send brief, targeted Information Requests to selected facilities that it has reason to believe may be out of compliance. Facilities will be required to respond to EPA answering four questions about their ammonia refrigeration systems, including whether a process hazard review has been performed. If a facility has not performed the required hazard review, EPA will inform the facility that it has violated the first duty of the General Duty Clause.

**Settlement:** Unless a significant release has occurred at the facility, EPA will offer to resolve this violation for a discounted penalty, provided the company agrees to perform a hazard review of its system with the help of an expert. The company will also be required to meet with emergency responders and submit any missing Tier II forms.

**Follow-up:** EPA will inspect a small subset of facilities to determine if the Initiative has improved compliance with the General Duty Clause.

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## How Can I Comply With EPCRA?

Section 312 of EPCRA requires facilities to report the presence of certain chemicals, including anhydrous ammonia, to emergency planning and response agencies. The goal is to ensure that emergency responders and planners know what chemicals are on site should they need to respond to an incident and that people in the community can get information about chemicals in their neighborhood.

## What Can I Do Now To Avoid a Penalty?

If you haven't already, conduct a process hazard review. Companies that respond to the Information Request indicating that a hazard review has already been performed will not need to take further action under this Initiative. To avoid EPCRA penalties, see if you qualify for penalty relief under EPA's Audit Policy. Go to [https://www.epa.gov/compliance/epas-audit-policy#\\_bookmark3](https://www.epa.gov/compliance/epas-audit-policy#_bookmark3) for more information and to <https://www.epa.gov/compliance/epas-edisclosure> for EPA's web-based "e-Disclosure" portal.

**EPCRA Inventory Forms (Tier II forms) are due annually by March 1.**

For more information about EPCRA reporting, go to: <https://www.epa.gov/epcra>.