

OPERATION OF AMMONIA REFRIGERATION PLANTS IN PUBLIC OCCUPANCIES

No: SO-BP 2017-02

Date of Issue: December 22, 2017

Part 1: Safety Order Scope**Scope**

The scope of this safety order is applicable to all refrigeration plants that are installed in a facility that is classified as a public assembly occupancy, which includes ice rinks and curling rinks.

In addition to the above scope, this safety order specifically applies to refrigeration plants that utilize ammonia as a refrigerant, that exceed 50 kW capacity, and that are subject to the provisions of section 45 of the Power Engineers, Boiler, Pressure Vessel and Refrigeration Safety Regulation as a Continuous Supervision Status Plant.

Part 2: Safety Order Requirement

Any owner of a refrigeration plant, within the scope of this safety order, shall comply with all of the conditions and timelines set out below:

- 1) The owner of a refrigeration plant within the scope of this safety order shall not authorize or allow the refrigeration plant to be in operation beyond the date of January 19, 2018, unless the plant is under constant supervision by an appropriately qualified person, that is in control of the plant and present on site within the immediate vicinity of the plant at all times when the plant is in operation.

- 2) The owner of a refrigeration plant within the scope of this safety order shall not authorize or allow the refrigeration plant to be in operation beyond the date of January 19, 2018 unless a Plant Supervision Program has been implemented on site.
The owner shall create, implement and maintain a documented Plant Supervision Program that meets all of the following requirements:
 - a. Plant information
 - i. Refrigeration plant(s) rated nameplate capacity of a prime mover in kilowatts (kW);
 - ii. Plant operating permit number(s);
 - iii. The date when the plant was first placed into operation;
 - iv. Type of refrigerant; and
 - v. Total refrigerant charge (kilograms or pounds of refrigerant contained within an individual refrigeration circuit(s);
 - b. Personnel Qualification Records
 - i. Names, Certificate of Qualification number(s) of the designated Chief Engineer of the plant (if applicable);

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- ii. Names and Certificates of Qualification numbers of the designated persons that will supervise operation of the plant (operators); and
 - iii. The owner shall post each Certificate of Qualification held by each person that is employed to operate the plant in a clean and safe place on the premises
 - c. Operating Schedules
 - i. Ice surface in / Ice surface out dates
 - ii. Plant operating schedule;
 - iii. Plant supervision shift schedule including the following for each shift:
 - 1. Date, start time and end times
 - 2. Names and qualifications of the operators
- 3) All documentation related to this safety order shall be made available to a Technical Safety BC Safety Officer upon request.

Definitions for the purpose of this Safety Order

- 1) **Appropriately qualified person** – for the purposes of this safety order, an appropriately qualified person means a person that holds at least one of the following Certificates of Qualification issued by a Provincial Safety Manager:
 - a. 4th Class Power Engineer (or higher);
 - b. Refrigeration operator; or
 - c. Ice facility operator; provided that all of the following conditions are complied with:
 - i. The refrigeration plant is an ice facility plant that is used to make and maintain an artificial ice surface that is used for recreational purposes;
 - ii. The plant does not exceed 1000 kW prime mover nameplate rating; and
 - iii. The owner has designated a person that holds a 4th class Power Engineer (or higher) or a person that holds a Refrigeration Operator Certificate of Qualification, as the Chief Engineer of the plant.
- 2) **Plant in operation** – for the purposes of this safety order, a plant is deemed to be in operation if any part of the refrigeration system contains ammonia at a pressure greater than 15 psig, unless the system ammonia charge is pumped down and contained in a liquid receiver, or parts of a system designed for that purpose, and isolated to prevent the circulation of ammonia.

Liquid receivers or parts of a system that will be utilized to store the refrigerant charge, shall be capable of containing the refrigerant charge without the liquid ammonia occupying more than 90% of the volume when the temperature of the refrigerant is at 32 degrees Celsius (90 degrees Fahrenheit).

The liquid receiver shall be provided with pressure relief devices(s) and any part of a system that contains liquid refrigerant (where the pressure can rise from hydrostatic expansion due to temperature rise and isolation valves being closed) shall be provided with overpressure protection in accordance with CSA B52 Mechanical Refrigeration Code.

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Part 3: Reason for Safety Order:

This safety order is being issued to prevent, avoid or reduce the risk of personal injury or damage to property as a result of the operation of an ammonia refrigeration system in a public assembly facility. Accidental ammonia leaks, from any pressurized system, have the potential to cause injuries, up to and including death, to any person within the immediate vicinity and surrounding areas.

Technical Safety BC has determined that a number of ammonia refrigeration plants, within the scope of this safety order, are currently being operated by person(s) that are not appropriately qualified in accordance with the Power Engineers, Boiler, Pressure Vessel and Refrigeration Safety Regulation. Owners of refrigeration plants are hereby notified that the operation of an ammonia refrigeration plant by any person that is not appropriately qualified is a prohibited activity under the Safety Standards Act.

Despite the timelines provided for in this safety order, Technical Safety BC has the authority to administer enforcement action(s) at any time, to any person, that is operating a plant in a manner that is prohibited by the Safety Standards Act.

Part 5: Provincial Safety Manager Order

This safety order is issued by a Provincial Safety Manager in accordance with sections 15 (d) and 31 of the Safety Standards Act.



Tony Scholl
Provincial Safety Manager, Boilers and Pressure Vessels

Failure to comply with this safety order is considered as an offence under section 72 of the *Safety Standards Act* and may result in further enforcement actions including Compliance Order, Monetary Penalty or Discipline Order.

A person affected by this safety order may appeal this order in writing to the Safety Standards Appeal Board within 30 days. The appeal process is set out on the Safety Standards Appeal Board's website at www.gov.bc.ca/safetystandardsappealboard

For more information about Technical Safety BC, please visit our website at: www.technicalafetybc.ca

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