NORTH GRENVILLE CURLING CLUB

AMMONIA LEAK RESPONSE PLAN – MEMBER AWARENESS & PROCEDURES

Updated: Nov. 2023

I. PURPOSE

NGCC utilizes an ammonia cooling system as part of its ice plant. The purpose of this document is to inform all members of the hazards associated with operating an ice plant as well as the hazards of ammonia. This document will help all members familiarize themselves with the location and type of alarm system and outline the steps members should take in the event of an alarm, and how to respond in a safe and timey manner.

The primary goal is to ensure all members are educated and aware of ammonia storage and the safety features that are in place. If there are any questions regarding this document, please contact the Club's current Health & Safety Director or Club President at ngcurlingclub@gmail.com.

II. INTRODUCTION/BACKGROUND

We want to draw attention to some of the background mechanics that are required to allow NGCC to provide the high quality "arena ice" that the club is so well known for. We utilize an ammonia cooling system as part of the ice plant. There are hazards which all members should be informed of. Members should also be aware of what to do in the event of an ammonia leak alarm at the club.

Ammonia is stored at NGCC within tanks (main chiller) that are under pressure. (Fig. 1) This is located at the ice-plant/compressor room. The location of this room is at the back end of the playing surface located behind sheet #2.

Fig. 1 – NGCC Chiller in the ice plant / compressor room

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Ammonia is the most used refrigerant in rinks throughout North America. It has been used as a refrigerant for over 100 years and should be respected, not feared. There are tolerable exposure limits, but there is also significant risk of harm or death to an individual if they are exposed to high levels of ammonia for a short period of time, or low levels of ammonia for a long period of time.

III. HAZARDS

When released into the atmosphere, it will evaporate quickly, usually forming into a vapour. It is a clear, colourless gas with a pungent odour. Ammonia is an irritant and corrosive to the skin, eyes, respiratory tract, and mucous membranes. Ammonia is lighter than air and will generally rise in dry air, but it is attracted to water so can behave different depending on the humidity in the air. In this case, it would remain close to the ground. The unpredictability of ammonia can create different types of emergency response approaches by first responders.

IV. PREVENTATIVE MEASURES

Regulatory Awareness & Compliance

NGCC has regular communication with qualified service providers as well as the third-party inspection firms which follow up on all current regulatory requirements. These professionals guide the club on the requirements to ensure we are complying with all regulatory requirements.

Routine Inspections and Maintenance

Throughout the course of the operating season, routine inspections and service is completed by our trained ice screw and Ice Plant Service Provider. Additional, annual inspections and calibration of the ammonia sensors and control systems are completed. After this inspection, a certificate is issued by Technical Standards and Safety Authority (TSSA).

V. ALARM SYSTEMS (Overview)

The compressor room is equipped with two localized systems.

Alarm System #1 (Red light): This system continuously monitors the compressor room with sensors connected to an audile and visual alarm. The purpose of this system is to monitor the airborne concentration of ammonia in the ice plant / compressor room.

Alarm System #2 (Amber light): This system is tied to the mechanical Equipment in the room and is NOT related to an ammonia leak. This system is in place to let the ice crew know a piece of equipment has either failed to start or has stopped working as intended.

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Members are asked to treat each alarm as a reason to evacuate the ice surface.

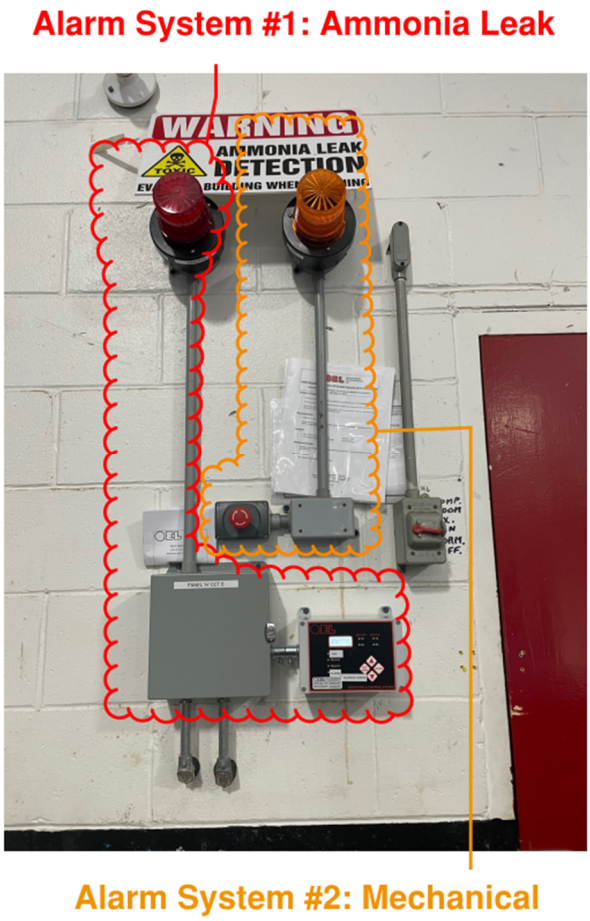

Fig. 2 – Alarm Systems (visual and audible alert for members)

The Ammonia system is calibrated yearly to activate and audible and visual alarm once a level of ammonia is detected at or above 35PPM. It is important to note that this level of exposure is tolerable up to one hour. Some facilities will not evacuate unless readings hit 250PPM, but NGCC members should evacuate the ice surface at the sound of ANY alarm.

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VI. ALARM & SAFETY FEATURES

The alarm system has **three stages of alarm**:

- **STAGE #1**: Exhaust Fan in the space with engage once the system reads 25PPM within the room. The room is now being ventilated to the exterior of the building.

- **STAGE #2:** The audible and visual indicator will activate once the room reaches 35PPM. This is the point when members are to follow the **Alarm Procedures** outlined in the next section.

- **STAGE #3:** Once the system records a reading of 50PPM for over two minutes, it will automatically send a signal to first responders that an ammonia alarm has been activated. This takes place through the integration of the ammonia alarm system with the NGCC main building fire/security monitoring system.

Additional safety features include:

- Plant emergency shutdown switch located outside the plant room. The switch should only be operated by a trained ice crew staff, refrigeration service company, or Fire Services.

- The controller located outside the plant room door has a visual display of the PPM concentration within the ice plant. This provides an indicator to any staff or first responders entering the room.

- The door from the ice surface into the plant room is equipped with door seals to assist with keeping the ammonia from entering the ice surface area.

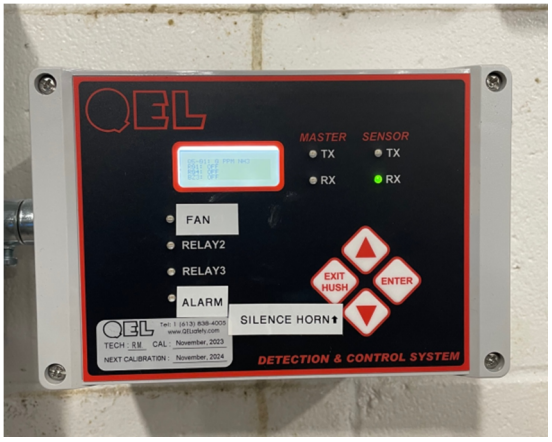

Fig. 3 – New ammonia detection controller with visual display

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VII. ALARM PROCEDURES

If the alarm is activated on the ammonia monitoring system, (Red light): follow the procedure below:

- **All players and visitors:**
  - Begin evacuation of the building. Leave the ice surface via the front of the house.
  - Enter Lower lounge and proceed outside via the appropriate exit.
  - CURLING IS CANCELLED until further notice. The current draw or league will not resume. All players and visitors are asked to leave the club and can head home. An email will circulate once the facility is ready to commence curling again.

- **League Convenor or appointed personal to lead the Emergency Response:**
  - Once outside
    - Call 911 and report the alarm.
    - Call Ice Crew member (if not on site already)
      - Steve Vokey @ 613 798 3987
      - Jeremy MacDonlad @ 613 762 4817
    - Call Club President
      - 2023-24: Shawn Berube @ 613 913 6339

Only re-enter the building when deemed safe by the Fire Department or by the Ice Crew Staff.

If the alarm is activated on the mechanical system, (Amber light): follow the procedure below:

- **All players and visitors:**
  - Please leave ice surface and proceed to lower lounge.
  - Curling is temporarily postponed until a review of the alarm takes place by the ice crew.
    - Curling may resume depending on the Ice crew availability to resolve

- **League Convenor or appointed personal:**
  - Once in the lounge:
    - Call Ice Crew member (if not on site already)
      - Steve Vokey @ 613 798 3987
      - Jeremy MacDonlad @ 613 762 4817
    - Call Club President
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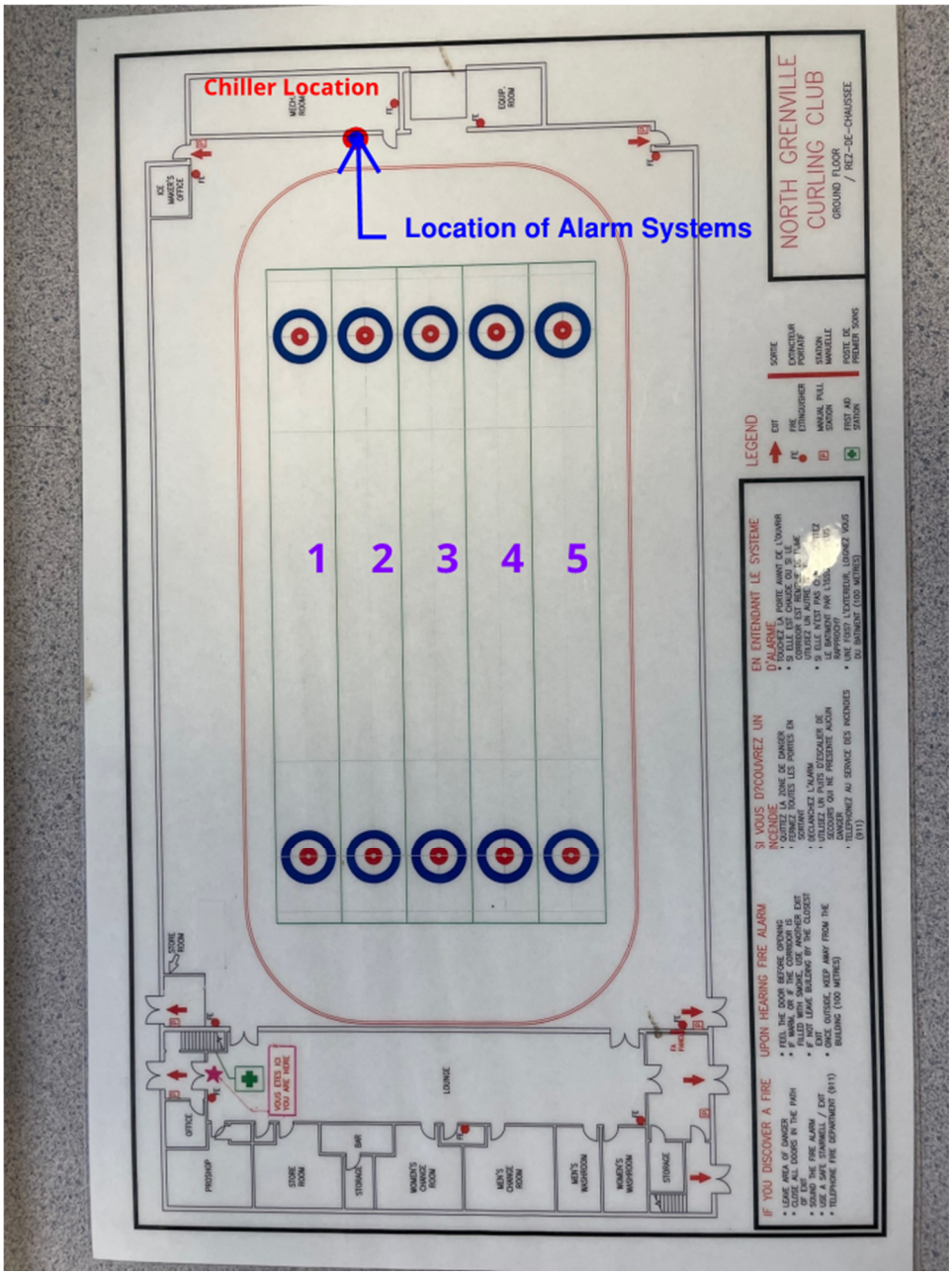

Fig. 4 – Curling club floor plan with ammonia hazard and alarm location