

Working Safely in Mechanical Rooms: Recreation Facilities

The Ontario Recreation Facilities Association Inc. (ORFA) regularly researches and writes about issues that could affect our clients. These documents provide an opinion on key risk management issues but are not meant to provide any form of legal opinion or official interpretation. No one should act on such information without appropriate professional advice after a thorough examination of the particular situation. All rights reserved. ©2014 Ontario Recreation Facilities Association Inc.

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Note: This document replaces the ORFA Suggested Guidelines for Entry Into Mechanical Rooms: Recreation Facilities (2002)

Introduction

An increase of inspection and enforcement of compliance by governing authorities has resulted in a heightened awareness to health and safety matters by all workplace parties. Recreation facilities are buildings that contain a variety of mechanical and electrical components. These constructions can hold any combination of liquids, vapours, mechanical and electrical variations that can place a worker at risk. Understanding the complexities of these types of buildings and what limits frontline staff have in maintaining or repairing these elements is an important part of any workplace specific training program. It is important that all workers understand their boundaries and not conduct any unqualified work in these areas.

In addition, being adequately prepared to take control of an emergency situation will help ensure worker and the general public's safety. This information is designed to bring forward specific legislation to assist recreation practitioners in understanding their current level of competency. This base assessment will help set the foundation of worker capability thus allowing them to perform some work, or by setting limitations to what work may be performed.

Competent Person

According to the Ontario Ministry of Labour a "competent person" means a person who,

- Is qualified because of knowledge, training and experience to organize the work and its performance;
- Is familiar with the Act and the regulations that apply to the work, and
- Has knowledge of any potential or actual danger to health and safety in the workplace.



Mechanical Room Legislation

There are several pieces of legislation that may impact how a refrigeration room is to be safely operated. The ORFA is unable to provide interpretation or specific direction to any owner as the obligation for compliance is left solely to those who are deemed to be in the care and control of these areas. It is strongly recommended that all persons responsible for the safe operation of any mechanical room review the applicable legislation to ensure compliance. Key documents include, but are not limited to:

- Occupational Health and Safety Act – both Industrial and Construction Regulations can apply
- Operating Engineer Regulation
- B-52 Mechanical Refrigeration Code
- ANSI/ASHRAE Standard 15-2007 – Safety Standard for Refrigeration Systems
- Building Code
- Electrical Code
- Fire Code
- Plumbing Code
- Asbestos Regulations

Controlling Mechanical Room Entry

All mechanical rooms should be kept secured to ensure entry is only by approved personnel. Pending

the design of the room and the elements found inside there may be a further obligation to post the entry area with applicable signage. This may include, but not limited to:

- ✓ Authorized Persons Only
- ✓ Hearing/Eye Protection
- ✓ Ammonia
- ✓ High Voltage



Recreation Mechanical Room Design

A recreation facility can have a variety of mechanical rooms spread throughout the building. These rooms may control electrical and water supply, or house HVAC-R equipment.

Simple worker safety rules in these areas include:

- ❖ If you have not been trained to work on the equipment – don't touch it!
- ❖ If it is electrical in nature and if you are not a licensed electrician and if you do not have an electrical permit or if you are not considered qualified to make an ESA log book repair entry – don't touch it!
- ❖ If you have not been trained to handle, transport, store and dispose of any noxious gases found in the facility – don't touch it!
- ❖ If you have not been given workplace specific training on the associated risks and dangers found in the room – you should not be in it!
- ❖ If you have not reviewed the applicable MSDS for the chemicals inside the room – you should not be in it!

Mechanical Room Dangers

As indicated, mechanical rooms will have dangers that can injure or kill an unprepared worker. Equipment that may start at any time, electrical

components that are considered high voltage, fluids that may be present in a vapour or liquid form as well as being under extreme pressure and equipment parts that may be both extremely hot or cold. Where possible such dangers should be identified with appropriate signage. Additionally, workers should be advised such dangers through the original internal workplace orientation program and reconfirmed a minimum of annually or after an incident or accident.



WHMIS

The Workplace Hazardous Materials Information System (WHMIS) is considered a cornerstone to all workers safety. This training program provides all employees with a clear understanding of their rights, short and long term health effects to chemical exposures, personal protective equipment and First Aid. Having up to date Material Safety Data Sheets available is a legal obligation of all employers while regular review and compliance to the information is a set employee obligation.

Employers are reminded that WHMIS is a two-step training program.

Step one: is core WHMIS training which provides an extensive overview of how WHMIS is designed and the roles and responsibilities of all workplace parties.

Step two: is a workplace specific training session on how the WHMIS system is to be implemented in the facility.

Duties of Employers

25. (1) An employer shall: (d) acquaint a worker or a person in authority over a worker with any hazard in the work and in the handling, storage, use, disposal

and transport of any article, device, equipment or a biological, chemical or physical agent;

Are Mechanical Rooms Considered a Confined Space?

The quick answer is no, not normally! Confined Spaces are governed under Ontario Regulation 632/05. The Regulation helps to determine if an area is considered a Confined Space based on the intended use of the space when originally constructed; and by what standards it was designed and constructed to allow people to occupy it. The definition of 'confined space' is consistent across all regulations. "Confined Space" means a fully or partially enclosed space, (a) that is not both designed and constructed for continuous human occupancy, and (b) in which atmospheric hazards may occur because of its construction, location or contents or because of work that is done in it." If you have a space that is fully or partially enclosed, the two conditions - (a) and (b) above - must both apply before the space can be considered a "confined space".

Clarification – the mechanical room is not a confined space if designed to allow for a person to walk in and walk out of with no restrictions. It has points of egress, available fire suppression, ventilation and proper lighting levels. However, if within the room there is an area that has a trap door, lid or other such protective device that secures entry into a crawl space or tunnel to piping, pumps or electrical allowing worker access for inspection or repair work - then this area may be considered or become a confined space. It is crucial to conduct a risk assessment to determine if any space is a confined space according to the definition outlined above. All elements of the definition have to apply for a space to be defined as a confined space.

Can a Mechanical Room Become a Confined Space?

No. A fire which could result in, lack of oxygen, or significant toxic gas leak may result in emergency conditions, but it does not make the area a Confined Space under the Regulation. The conditions inside the room have changed, but the construction conditions in the room have not. The area is still constructed for continuous human occupancy so the room still does not meet the definition.

Confined Space Training

Confusion occurs as employers try and determine staff training requirements. There are two levels of training to be considered. **Level I:** Confined Space Awareness training. This training should be provided to all persons who are granted access to high risk confined space areas. The intent of this training is to ensure that workers understand the concept of Confined Spaces and are able to take them self and others out of harm's way. **Level II:** is for persons expected to enter Confined Space conditions. This level of training must be performed only by highly skilled professionals qualified in such matters. Ontario Regulation 632/05 Confined Spaces <http://www.e-laws.gov.on.ca>

Mechanical Room Structural Failure

Buildings that are poorly designed or are failing may slowly increase worker risk. Situations such as ongoing water penetration that enter electrical systems or increased humidity levels that cause wood rot or metal fatigue are all recognizable risk factors that need attention. Every part of a facility has a maximum life expectancy. Only by having and monitoring a set life-cycle plan for the building can facility management be sure of the buildings structural integrity. Workers must continually monitor building conditions and consider how such situations may impact their health and safety. Joint Health and Safety Committees (JHSC) must also consider these types of situations when conducting inspections.

Emergency Showers and Eyewash Stations

Emergency shower and eyewash stations provide on-the-spot decontamination. They allow workers to flush away hazardous substances that can cause injury and effectively extinguish clothing fires. The need for emergency shower and eyewash stations is based on the properties of the chemicals that the worker may be using or exposed to. A job hazard analysis can help evaluate the potential risk of exposure in various work areas. Emergency showers also known as drench or deluge showers, are designed to flush the workers head and body. They should not be used to flush the workers eyes because the high rate or pressure of water flow could damage the eyes. Eyewash stations are designed to effectively and safely flush the eye and face area. For refrigeration mechanical rooms holding ammonia the B-52 Mechanical Refrigeration Code requires that shower and eyewash systems be installed near the room.

Factors that should be considered when selecting and installing shower/eyewash systems include, but are not limited to:

- Potentially hazardous substances in the immediate work area
- Number of workers in the area of the hazardous substance
- Isolated workers (an audible or visual alarm may need to be installed to advise when a shower/eyewash system has been activated)
- Comfort and warmth
- Quality of flushing fluid
- Neutralizing solutions

Hand Held Eyewash Bottles

Hand held eyewash bottles should not be confused with eyewash stations. They are designed to assist a worker in getting to an eyewash station. Flushing fluids are described as any potable water source, preserved water, preserved buffered saline solution or any other medically accepted solutions. Eyewash bottles require continual inspection to ensure they are filled. The primary purpose of the eyewash bottle is to provide immediate flushing capability to the worker, so that they may get to a shower or eyewash station. They cannot be installed in lieu of a permanent shower/eyewash system.

Alarms

Many variations of gas monitoring devices are made available for today's recreation practitioner. Hard-wired systems, to individual portable monitoring devices can be an enhancement to the safety of any operation. It is important to note that where the signal wire passes through a wall, the hole must be completely sealed with a suitable caulking and not placed in a conduit, as the conduit will allow for released gas to escape through the wall.

One purpose of this equipment is to warn of emergencies in machinery rooms. They may be audible, visual or both. They may be staged meaning that a different level and range of sounds may be transmitted based on the situation. All workers responsible to respond to or take control of emergencies situations must be trained to identify all alarms found within the building. Silencing any alarm should only be completed once the situation has been identified, corrective action taken and human safety is no longer an issue. No person should ever disconnect, alter or silence an alarm solely due to annoyance.

The Section 5.2 of the B-52 Mechanical Refrigeration Code requires that "All refrigeration rooms must have a refrigeration vapour detector that will sound an alarm and start the ventilation equipment at vapour concentration levels specified in the Code (**300ppm for Ammonia**) for the refrigerant being used".

Triggered alarms inside and outside the refrigeration machinery room; signage warns refrigeration technicians and bystanders not to enter when the alarm has activated. Confusion may occur if staff is not adequately trained to respond. It should not be assumed that as the alarm has been activated that the level of toxic gas in the room is at this specific set level. Alarms that are activated at 300ppm might have as much as 100x more vapour inside the room than what first triggered the alarm system.

NOTE: It is important that a maintenance and calibration program for all alarm systems be developed and implemented.

Aquatic Facilities

An extreme caution is given to employees in aquatic facilities. Untrained individuals who enter into areas housing lithium, calcium, stabilized powder, tablet or granular chlorine compounds, and who accidentally introduce common items such as coffee, soda, cleaning solutions, acid or oils to these stored sanitizing products, may result in an explosion and/or spontaneous combustion, releasing an undetermined amount of chlorine gas.

In aquatic facility operations, a sensor must be located in the room where the gas(es) is located. However, the alarm/signal/monitor panel should be located in a safe remote area.

Asphyxiation

Many of the gases in a recreation facility will not kill a human, however, the displacement of air will. When a gas reduces oxygen content in any area, breathing support is required. Workers are reminded that tested areas may quickly increase in concentration of gases causing an area with a small leak that seemed safe to quickly become unsafe for human occupancy.

PPE

The MSDS is the primary source to required PPE. Appropriate respirators, Self-Contained Breathing Apparatus (SCBA) and full body protection may all be required based on the noxious gas amounts on site.

As with any PPE training is paramount to a workers safety. Swimming pools that use Chlorine gas must have SCBA (and trained staff) on site while there is legislative obligation for refrigerants.

Mechanical Room Emergencies

Explosion, fire or elevated levels of noxious gases are all factors that may place humans at risk. Recreation facilities will have both workers and members of the general public present at any given time. All levels of facility staff will have several legislative obligations to consider during emergency situations.

The OHSA requires that owners keep the facility safe and in proper working order.

Duties of Employers

OHSA [25. \(1\)](#) An employer shall ensure that,

- (a) the equipment, materials and protective devices as prescribed are provided;
- (b) the equipment, materials and protective devices provided by the employer are maintained in good condition;

Aged buildings may have alarms that are triggered due to corrosion or defect. Often staff is lulled into a state of unpreparedness based on ongoing false alarms. Such situations should be considered to be an unsafe work environment. The OHSA Internal Responsibility System makes the worker a partner in safety. Refusing unsafe work would be deemed an appropriate response to employers who fail to make the necessary corrections to an alarm system.

Additionally, aged plant rooms that have a constant release of noxious gases will have workers build a tolerance level to elevated levels. A reminder to the short and long term health effects of the WHMIS training program is extended. Workers are again reminded in their role to ensure a safe workplace exists.

The Fire Code requires persons to take care and control for the evacuation of any building that places human safety at risk. The Fire Code however does not place full responsibility on the building staff. There is an applied obligation that persons in charge of events being held within a facility during an emergency will take responsibility for those persons during an evacuation.

It is important to be reminded that all Fire Alarms MUST be treated as real and evacuation is to take place. The only person allowable to call an "ALL CLEAR" is the Fire Chief or their designate.

Operation Engineer Regulation: Procedure Manual

46. Every owner of a plant shall keep on the premises of the plant an up-to-date, detailed operating procedures manual designed by or acceptable to the chief operating engineer or chief operator of the plant that sets out the procedures relating to training and the operation of all equipment and systems of the plant and all emergency procedures. [O. Reg. 219/01, s. 46.](#)

Fire Department Tour/Evaluation

Facility management should take a lead role in introducing their local fire departments to the potential hazards related to their operations. A tour of the facility with key individuals of the fire department outlining emergency equipment, devices and plans, which are currently on site, as well as, the noxious gas inventory of the facility, is essential to community safety. The fire department may be better served in preparing for an emergency situation by having the recommended body suits in their inventory of response equipment.

Noxious Gas Inventory

Most recreation facilities have no exact record of type of toxins on site and what maximum amounts are being stored on site. Beyond the canisters used for replenishing purposes, facility managers must be able to accurately relay to EMS professionals estimated amounts and locations of all noxious gases that might be on location during an emergency. Further, it is important to understand the immediate impact zone should a significant leak or event occur. Schools, home for the aged, children play areas, sports fields or residential homes can all be impacted. Do you have an adequate notification plan in place?

"Recreation facility staff must be trained to take each facility alarm situation seriously and to evacuate under clear guidelines brought forth by management".

Example Emergency Procedures From Section 14 - ANSI/ASHRAE Standard 15-2007

As an example (and there are many other possibilities), consider a facility that wishes to use its own technicians to handle minor problems in the refrigerating machinery room. The facility takes the following steps:

1. Provides the refrigerant alarm required by Section 8.11.2.1, along with signage warning “Authorized Personnel Only. Stay Out When Refrigerant Alarm Sounds; Call Facilities Management Immediately.
2. Provides a digital readout of the current refrigerant detector reading outside the refrigeration machinery room.
3. Provides refrigeration technicians with appropriate respiratory protection suitable for use in an atmosphere containing refrigerant in concentrations below the IDLH, in accordance with all applicable national and local regulations.
4. Defines as “incidental” any refrigerant release that is not producing levels above the IDLH in the machinery room.
(The ventilating system will render many potential releases incidental.)
5. Trains the technicians to leave the refrigerating machinery room when the refrigerant alarm sounds. After donning appropriate respiratory protection (if necessary), they may re-enter the machinery room to close valves, fix leaks, shut off alarms, etc., *if and only if* the current refrigerant level is below the IDLH. That is, technicians may re-enter the room if the refrigerant release is incidental. If the level exceeds the IDLH or the problem seems uncontrolled in the sense that it may unpredictably worsen or require a team of technicians to fix, they are to leave and call for emergency responders.
6. Coordinates emergency procedures with the local emergency response agencies in advance.

None of these steps contradicts the requirements of the standard, but the additional procedures significantly aid the facility’s efforts to handle minor maintenance problems safely.

Additionally, having an emergency plan as part of the relationship with the buildings mechanical contractor(s) should be considered a standard appendix addition to all contracts for service.

Other Recommended ORFA Guidelines

Working Safely in Recreation Mechanical Rooms:

http://www.member.orfa.com/Resources/Documents/librarydocs/guides_bp/Working%20Safely%20in%20Recreation%20Mechanical%20Rooms%20Dec2013.pdf

Confined Space FAQ:

http://www.member.orfa.com/Resources/Documents/librarydocs/guides_bp/Confined%20Space%20FAQ%20Registered%20Refrigeration%20Plant%20Rooms.pdf

Refrigeration Room Safety Identification of Risks and Hazards:

http://www.member.orfa.com/Resources/Documents/librarydocs/guides_bp/Refrigeration%20Room%20Safety%20Identification%20of%20Risks%20and%20Hazards.pdf

Refrigeration Plant Rooms: Responsible Person:

http://www.member.orfa.com/Resources/Documents/librarydocs/guides_bp/ORFA%20Responsible%20Person%20Jan2014.pdf

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