

# FACILITY ALERT

## Ice Resurfacer Awareness

December 2007

Please be aware that there have been two different incidents during the last four months that have resulted in the ice resurfacer erupting into flames on the ice surface. Both incidents took place without injury or loss of life, however, it does draw attention to the need for regular, comprehensive, inspection of all equipment in the workplace by all workers.

The most recent incident took place December 1, 2007 in Aston, PA and little detail is available as the incident is under investigation by authorities. <http://abclocal.go.com/wpvi/story?section=news/local&id=5806347>

On August 8, 2007, an ice resurfacing machine was clearing the ice at the Novi Ice Arena (MI) when a hydraulic leak ignited. Players on break and the machine driver witnessed the fire and the arena was smoothly evacuated. A crowd of approximately 150 people, including players, coaches, parents and staff, were in the ice arena at the time of the incident. No injuries were reported. Insurance adjustors assess damage to the ice resurfacing machine a total loss, estimating it at \$50,000 to \$60,000. Assessed damages to the ice arena are more than \$200,000.

- The ice resurfacer involved in this incident was a 2004 Zamboni 540;
- The ice resurfacing machine was purchased in August 2004. It was most recently inspected and serviced in late July 2007;
- Fire officials have yet to confirm what caused the fire;
- The arena was evacuated and, while Novi firefighters were on the scene, the machines two propane tanks ignited;
- No one was hurt in the fire;
- The driver may have been saved by his action of immediately leaving the machine once the fire had been detected. It is unclear if the unit was shut off when the operator left the machine.\*

**\*Note:** Leaving an ice resurfacer in operation, even at idle, during such an occurrence will result in oil continually pumping through the hose failure; thus feeding fuel to the fire source.

Should an operator suspect that a fuel leak has occurred causing a fire while operating the ice resurfacer, it is **strongly recommended** that every effort be made to reduce the amount of hydraulic fluid that travels to the fire source. Attempt to shut off the equipment and the fuel tanks. These actions will ensure that burning fuel hoses will not release another fuel source to the fire before evacuating the area. **However, protecting operator and public safety and preventing loss of life must always take precedence in these situations.**

### Note:

Hydraulic fluid that leaks onto an ice surface can cause ongoing poor ice conditions and should be hand scraped and disposed of in a proper manner.

It should be noted that the focus of this alert should not be placed on the make and model of ice resurfacing equipment. Ice resurfacer manufacturers use extreme measures to ensure that their equipment is properly constructed using the best available materials and methods. However, much like the fire involving an Olympia which occurred in Sudbury, Ontario in 2002 (see O.R.F.A. Facility Alert 2002-01 <http://orfa.com/facilityalert/IRU.pdf>) it is a fact that equipment failure will at times occur without warning. These 2 alerts are reminders of: the ongoing need for facility management to ensure that a process for **regular and comprehensive inspection of all equipment used in the workplace be developed and implemented**; and **the need for ongoing training on how to respond to emergency situations be a part of every facilities operation manual.**

### Note:

Ice resurfacing equipment is created with a series of high pressure hydraulic hoses used to power various pieces of the equipment. These hoses are under constant pressure, even at idle and with full operating speed generating as much as 1500-1800 p.s.i. of pressure

Human skin that is exposed to hydraulic oil is considered a high risk for long term health affects. Oil that is under pressure will easily cut human skin, fingers or limbs. Remember to regularly review MSDS to understand what immediate First Aid action is required when exposed to hydraulic fluid. Seek immediate medical attention as required

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It is important to note that although the cockpits of newly manufactured ice resurfacers are designed to protect the driver from oil hose failure. **Unauthorized riders will not be afforded the same protection.** These risks should be communicated to operators.

### RECOMMENDATIONS

#### CORRECTIVE MEASURES

- Response by staff should include immediate shutdown of the engine by turning off the ignition thus reducing the supply of fuel to the fire.
- Initiate emergency procedures for your facility.
- If a fire is of a serious nature, activate the fire alarm to begin the evacuation process from the facility as soon as possible.
- Wait until the "Fire Chief" provides the "All Clear" prior to allowing anyone back into the facility.
- If the incident occurs on the ice, ice depth readings should be conducted in the area of the fire and recorded in the ice log as safe prior to being used by any skating patron; it is further suggested that consideration for floor piping inspection be given when extreme heat much like occurred in this recent event be given
- Ice resurfacers should have a comprehensive inspection by a recognized professional prior to being placed back into service. Contact manufacturer.

#### PREVENTIVE ACTIONS

Hydraulic hose assemblies are not designed to leak. However, even new hoses have been known to fail due to faulty materials or construction methods. Operators should show as much diligence when inspecting new equipment as with older equipment.

- Inspect hydraulic fluid levels and condition as part of a "daily detailed circle check".
  - Oil should be a bright red in colour and levels maintained as recommended by the manufacturer,

- Pinkish coloured oil suggests water may have entered the system,
- Black coloured oil suggests that the oil has been raised to a high level of heat causing it to burn,

- Hydraulic hoses showing any sign of moisture warrants the lock out of equipment until further inspection by a qualified technician.
- Fire suppression should be reviewed with all employees so that they are prepared to handle these situations should they occur.
- 5-lb ABC chemical fire extinguisher should be attached to every ice resurfacers as a first response to similar incidents.
- 20-lb ABC chemical fire extinguisher should be available in all ice resurfacers rooms
  - It is important to note, that although fire extinguishers suppress the fire, there is no cooling affect. To ensure a "bleve" (boiling liquid expanding vapour explosion) does not occur, a fine mist of cold water may need to be applied in order to cool the fuel tanks. In the most recent fire the empty propane tank did explode while the full tank remained in tact.

#### CHANGING HYDRAULIC OIL

- Recommendations for changing of hydraulic oils will vary between manufacturers based on make and model. please refer to your owners manual and manufacturer representative for specific direction for your unit
- Change all oils on equipment after the first operating season or 12-months, whichever comes first. Followed this by an oil change every 2-seasons or 24-months thereafter.
- Other manufacturer recommendations may suggest only changing oils when failure or oil condition has been detected.
- Any oil that is added to an ice resurfacers first requires filtering to

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remove contamination. *Note: this includes oils that arrive in capped secured condition; filtering is still required.*

- Schedule hydraulic hose replacement for any equipment that is older than 10 years. Hydraulic hoses should be fitted with “hose wrap” where necessary and secured to avoid damage by rubbing or pinching.
- Inspection by a “competent person” of all existing ice resurfacers hydraulic hoses for wear, replacing any suspect equipment should be an ongoing operational activity. Workers unfamiliar with such inspections should seek out expert advice to assist with this activity.
- Replace damaged or worn equipment. **Note: NEVER inspect hoses while the unit is running; hose failure while under pressure significantly increases the level of risk to personal health and safety risk.**

### MEMBER RESOURCES

The O.R.F.A. continues to develop and update training materials. O.R.F.A.’s series of maintenance logbooks will assist facility operators reduce the risk of equipment failure resulting from aging equipment or poor operational practices. Consider the current level of training available to your staff in these matters and be aware that the following is available to assist you with your facility operations.

- **Ice Resurfacers Log Book** – a book that guides the regular inspection of ice resurfacing equipment resulting in a tool that is filed to help prove operational diligence to Fire Officials, Insurance Claim Experts and internal upper management when such incident occurs
- **Safe Ice Resurfacers Operations (SIRO) course** – a 1-day introduction to ice resurfacers operations that results in a certificate of training that indicates exposure to industry best practices for ice resurfacers operations
- **Ice Maintenance and Equipment Operations (IMEO) course** – a 4-day comprehensive training course that investigates in detail ice resurfacers

operations as well as proven operational activities, This course further contains some hands-on training activities with on site equipment

- **Suggested Guidelines for Emergency Planning and Evacuation Procedures** The purpose of this document is to provide guidance to recreation facility operators in designing a plan of action to deal with emergency situations that may occur in the facilities under their jurisdiction (available at [www.orfa.com](http://www.orfa.com) )

NOTE: Contact your ice resurfacers manufacturer for resource and maintenance support information. Be sure to follow all recommended maintenance practices and safety measures as recommended by the manufacturer of your ice resurfacers.

### Member Support:

Are your employees adequately prepared for the day to day operational activities at your facility? Visit the O.R.F.A. website at [www.orfa.com](http://www.orfa.com) for more information on training opportunities available to you and your staff, or contact O.R.F.A.’s Technical Director at [tpiche@orfa.com](mailto:tpiche@orfa.com) to discuss the various training opportunities available to you.

O.R.F.A. main office 1-800-661-ORFA (6732) or 416-426-7062 for local calls.

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