



ONTARIO RECREATION
FACILITIES ASSOCIATION INC.

ICE WORKER HEAD PROTECTION

March 2008

The ORFA does not consider itself an authority on any health and safety matter. This information is offered as a general awareness to encourage internal discussions and action on subjects that are considered high risk for the recreation industry. The following is intended for information purposes only and should not be considered a sole source for policy and/or procedure development.

In Canada some sixty thousand workers get injured annually due to fall accidents. This number represents about fifteen percent of the "time-loss injuries" that were accepted by workers' compensation boards or commissions across Canada. Not mentioning a great economical loss, it amounts for a lot of pain and suffering and sometimes (much too often) even death." All these, in most of cases, do not have to happen. What is needed is:

- *understanding how fall accidents happen,*
- *identifying the trouble areas, and*
- *eliminating or minimizing hazards of falling. (Source: CCOHS)*

Recreation ice facilities are encouraged to review the **Personal Protective Equipment (PPE)** needs of workers who conduct any type of work on the ice surface.

History of Head Protection in Ice Arenas

Rarely has head protection been worn by ice facility workers over the years. Head protection today is still not considered to be fashionable or essential. However, times and the arena industry has changed.

Headgear in Hockey: Although unconfirmed, it may have been defenseman George Owen who wore a leather helmet in his first season with the Boston Bruins in 1928. Before that, some players wore headgear for looks -- and it wasn't always helmets that the players put on. Quebec's Herb Scott wore a pink handkerchief around his head in a game against Ottawa in 1892. Expecting rough play in a Stanley Cup game in 1905, referee Mike Grant wore a construction worker's hardhat. Defenseman Johnny Crawford hid a baldhead under a leather helmet in the 1940s. Going without a helmet was a dangerous thing to do. Countless injuries could have been avoided and more than a few hockey careers wouldn't have ended so early, if all players had worn helmets. It wasn't until the 1970s that the NHL created a rule that any players signing on for the NHL after June 1, 1979,

had to wear a helmet. Those already playing were allowed to make their own choice about whether or not to wear a helmet.

Mr. Craig MacTavish, of the St. Louis Blues, was the last bareheaded NHL player, skating his final season in the 1995-1996 season.

Source:

<http://www.collectionscanada.ca/hockey/kids/024003-2000-e.html>

What Does the OSHA Say?

The **Occupational Health and Safety Act (OHS)** does not speak directly for the need to wear head protection by workers in ice facilities. However, there is a noted increase in the use of head protection by arena staff in some ORFA member facilities. Some of these cases may be a direct result of incident/accident reports while others in the industry are merely gauging the trend toward safety prevention and have taken action.

Is it really necessary?

The **City of Mississauga** received "orders" from the **Ministry of Labour (MOL)** to have their skate patrol staff wear head protection. In response, effective March 2006, the City of Mississauga requires all skate patrollers to wear CSA approved helmets. The **City of Ottawa** requires that any worker that enters onto an ice surface must wear head protection. Other recent "orders" from the MOL include those to several **school boards** for the need to protect teachers who conduct supervisory duties on an ice sheet; and the need to wear head protection. *These examples indicate a higher expectation by the MOL toward worker protection in these environments.*

"The lessons learned here are simple and the injuries are preventable. Hazard identification and the implementation of safe work practices are essential to proactive safety management."
Source: MOL Orders to Ontario School Boards 2007

The action by Mississauga, Ottawa and the school boards clearly identifies an increased risk of injuries associated with falls on the ice surface.

If there is no specific legislative responsibility to wear head protection on an

ice surface then what should workplaces use as a guide?



OHSA Duties of Employers

(25) (2) Without limiting the strict duty imposed by subsection (1), an employer shall provide information, instruction and supervision to a worker to protect the health or safety of the worker;

(h) Take every precaution reasonable in the circumstances for the protection of a worker

It is the recommendation of the ORFA through the Ice Maintenance and Equipment Operations course and Safe Ice Resurfacer Operator course that CSA approved head protection is worn by all persons who work on any ice surface.



Slips and Falls

Slips are primarily caused by a slippery surface compounded by wearing inappropriate footwear. Two types of slips occur throughout normal walking activity. The first of these occurs as the heel of the forward foot contacts the walking

surface, as the front foot slips forward the person falls backward.

The second type of fall occurs when the rear foot slips backward. The force to move forward is on the sole of the rear foot, as the rear heel is lifted and the force moves forward to the front of the sole, the foot slips back and the person falls.

Understanding the Coefficient of Friction

The force that allows you to walk without slipping is commonly referred to as "traction." Experience shows that dry concrete sidewalks have good traction, while icy surfaces or freshly waxed floors can have low traction.

Technically, traction is measured as the "coefficient of friction" (COF). The coefficient of friction depends on two things: the quality and condition of the walking surface and the soles of your shoes. A higher coefficient of friction means more friction, and therefore more traction.

To prevent slips and falls, a high coefficient of friction (COF) between the shoe and walking surface is needed. On icy, wet or oily surfaces, the COF can be as low as 0.10 with shoes that are not slip resistant. A COF of 0.40 to 0.50 or more is needed for excellent traction. To put these figures in perspective, a brushed concrete surface and a rubber heel will often show a COF greater than 1.0. Leather soles on a wet smooth surface, such as ceramic tile or ice, may have a COF as low as 0.10.

Shoes with soft rubber soles and heels with rubber cleats provide a high coefficient of friction (COF).

Behaviours that Lead to Falls

In addition to wearing the wrong footwear, there are specific behaviours that can lead to slips, trips, and falls. Walking too fast or running can pose a significant risk for fall injuries. In normal walking, the most force is exerted when the heel strikes the ground, but in fast walking or running, more force is on the heel of the front foot which pushes harder off the sole of the rear foot; thus, *a greater COF is required to prevent slips and falls.* Rapid changes in walking direction create a similar risk.

Anyone can fall, but the risk of falling becomes greater with age. As a worker ages stability and balance is affected and more falls can occur without having prevention measures in place.



Other problems that can lead to slips, trips and falls are:

- distractions;
- not watching where one is going;
- carrying materials that obstruct view;
- wearing sunglasses in low-light areas;
- failure to use handrails or the pull handle on an ice resurfacer;
- improper mount/dismount procedure on the ice surface or in the storage area

These and other behaviours can lead to falls, injuries, or even death.

NOTE: When mounting or dismounting the ice resurfacer use the proper 3-point contact method. *The Three-Point System means that three of your four limbs are in contact with the ladder or vehicle at all times, either one hand and two feet, or two hands and one foot; only one limb is in motion at any one time; always step down backward, never "jump" or "fall" down forward.*

Learning How to Fall

Naturally, the goal is not to slip, trip or fall but the possibility of a fall still exists.

Staying safe on ice:

- Wear proper footwear
- Walk slowly
- Take small steps
- Be aware of footing

- Keep both hands free
- Use ice cleats
- Consider use of head protection

When falling, the objective is to have as many square inches of your body make contact with the surface as possible, thus, spreading out the impact of the fall.

- Tuck your chin in, turn your head, and throw an arm up. It is better to land on your arm than on your head.
- While falling, twist or roll your body to the side. It is better to land on your buttocks and side than on your back.
- Keep your wrists, elbows and knees bent.
- Do not try to break a fall with your hands or elbows.

Report, record and thoroughly investigate all slips, trips and falls, with or without injury; take corrective action immediately to prevent similar incidents from occurring.

Which workers might require head protection while on the ice?

Each workplace should assess the safety of workers performing work on or near the ice surface. This includes:

- Ice resurfacer drivers
- Ice technicians
- Assistants to facility staff
 - Ice scrapers
 - Net peggers
- Timekeeping staff walking across the ice surface to and from their work stations
- Skate patrol staff

Consideration should also be given to special event staff (volunteer or other) and government officials who may be conducting facility inspections on the ice surface as part of their job.

Is the ice surface your only concern?

Although the focus of this document is specific to the ice surface, other high-risk areas can often be found in a recreation environment. Pool decks, washroom areas and floor areas receiving general maintenance will contain

water; while mechanical rooms may have oil or refrigerants on the floor. Poorly designed ice rinks may have the refrigerant pipes extend past the dashboards creating a slippery area. Remove water or other liquids immediately and if the cause of the leakage is structural, arrange for repairs of the roof or leaking pipes.

Is Head Protection the only PPE to consider?

Other PPE such as ice cleats, gloves, eye protection, hearing protection and long pants and shirt sleeves may also be required when working on the ice. Consider these items when conducting a Job Hazard Analysis for arena attendants.

Installation of protective netting around the dashboard system in ice arenas is another practical measure to protect those who work and play in these environments.

CONTROLLING HAZARDS WITH PPE

Where a hazard is identified, try to control that hazard at the source or between the source and the worker. Before turning to PPE, consider the following:

- eliminate the hazard through engineering controls at the source, this could mean having to modify or replace equipment
- substitute hazardous materials or substances with less or non-hazardous alternatives
- redesign the work process (e.g. modify sequence of tasks to improve safety)
- isolate the hazardous agent (e.g. designated room or local ventilation)
- develop administrative controls (e.g. limit the time exposed to the hazard)



Selecting the right on-ice head protection

The ORFA is not an authority on head protection. Each workplace must assess their

workplace activities and decide upon the appropriate personal protective equipment for workers by way of a job hazard assessment. Include any known or potential hazards that a worker might encounter throughout their daily activities.

Managers, or the most qualified staff person, should first observe the workplace and the tasks being performed. Employees should be invited to participate in the review process. A review of incidents and accident reports is an important part of the policy and procedure development.

It is important to note that a hazard assessment is not a one time event and that ongoing review is an important part of the Internal Responsibility System.

For on-ice activities any form of head protection that is selected must be CSA approved and include a chinstrap assembly. Include the proper use and care of the selected head protection and the chin assembly attachment in any policy that is created.

- Train workers to properly inspect the headwear prior to using it.
- Heat, solvents, paint, stickers, sunlight or impact can all weaken the shell of the headgear.
- Replace headgear immediately after impact occurs even if there is no visible sign of failure.
- Regularly clean headgear as dirt and stains may hide in small cracks.
- Do not alter headgear in anyway from its original design.
- Store headgear properly when not in use.
- Headgear may pose a health and safety risk for (head-related) communicable disease. Consider a system of disinfection for the equipment; or limit use to one worker only.

Recommendations

Establish and implement policies and practices for all recreation facility staff. The following recommendations are provided for your consideration:

- Provide safety training for all new employees.



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- Retrain all employees on a regular basis.
- Require that all on-ice workers wear proper footwear for their job duties and work environment. Working with an edger may require wearing ice cleats.
- Report and thoroughly investigate any slips, trips and falls, with or without injury. Take corrective action and provide additional training to prevent a similar incident.

Any piece of PPE will only work if it is worn consistently and correctly. Protective headgear must fit snugly and be properly adjusted for the person wearing it. All straps should be firmly in place at all times. The head piece should be thoroughly inspected prior to each use and stored properly when not in use.

“The use of head protection by all workers in ice facilities should now be considered standard in the ice industry” - ORFA February 2008.

CITY OF OTTAWA HEAD PROTECTION POLICY

As a result of a critical injury that a City of Ottawa employee experienced, we have decided, in consultation with the Ministry of Labour and the City's Corporate Health and Safety group, to initiate the following work practice. Effective June 1, 2004, it is mandatory for all RPAM employees and contractors to wear head protection, as provided by the City, while performing duties on ice surfaces within all City Arenas. There shall be no exceptions.

Your immediate Supervisor will be issuing the approved head protection gear to you and providing instructions and training on the proper use of the head gear in accordance with the manufacturer's instructions and known hazards.

All workers will be expected to use the equipment provided by the employer in accordance to the instructions and training received. There will be two additional head protection units maintained on site by each Facilities Supervisor to issue to contractors who must go onto the ice surface.

Please ensure that your head protection unit is secured, as each employee will be responsible for the replacement if lost.

Please understand that this is intended as a safety measure, so as to protect you from possible head injuries while performing ice maintenance and it is hoped that you view this as a positive step in ensuring Workplace Health and Safety.

If you have any questions or comments in this regard, please discuss them with your Supervisor. (Source: City of Ottawa)

MOL ORDERS ISSUED FOR TEACHER-SUPERVISED SKATING ACTIVITIES

Spring of 2007

Head protection is a common topic of discussion in many working sectors. While we may think that risks associated with head injuries only occur in high risk sectors, such as construction, or in an industrial setting, we can't ignore this hazard in the education sector. The activities that are planned at our schools change with the seasons.

Winter fun often suggests skating activities and the hazard posed for potential head injuries is very real, with numerous incidents occurring each year, often resulting in some degree of head trauma. This past winter, the MOL investigated several cases of critical injuries involving teachers who had fallen on the ice while supervising skating at a local arena or outdoor rink. As a result of the investigations, several orders were written against various school boards.

The orders were made under Section 25(2)(h), dealing with exposure to the hazard of falling, specifying that suitable head protection should be worn; Section 25(2)(a), dealing with providing instruction and training regarding the use and care of head protection; and Section 57(4), dealing with the submittal of a compliance plan. The lessons learned here are simple and the injuries are preventable. Hazard identification and the implementation of safe work practices are essential to proactive safety management.

In the case of skating activities, all it takes is the acknowledgement of a potential hazard for head



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injury and the preventive measure to wear a helmet. (Source: April 2007 Newsletter. ESAO)

NOTES:

CSA Z94.1-05 INDUSTRIAL PROTECTION HEADWEAR

Scope and Application:

This standard applies to protective headwear selection, care and use for industrial, construction, mining, utility and forestry sectors. It defines areas of the head to be protected, performance requirements for dielectric strength, impact attenuation, penetration resistance, stability, flammability and ignition. It does not apply to comfort, service life, appearance, bump caps, firefighter helmets, rescue helmets, crash helmets, sports helmets, recreation helmets or riot control helmets.

CHINSTRAP ASSEMBLIES

Definition: Chinstrap assembly - the assembly that maintains headwear in position on the head by means of

- (a) a strap or straps that pass under the wearer's chin; and
- (b) fasteners and associated attachments to the headwear that hold the assembly together.

5.7.7 Chinstrap assemblies

A chinstrap assembly should be used in conditions where the headwear can become dislodged from the user's head. Chinstrap assemblies should be installed so that they are snug yet secure and comfortable. The user should ensure that the chinstrap has been designed for the particular make and model of headwear. (CSA Z94.1-05)

Sources:

Canadian Centre for Occupational Health & Safety (CCOHS)
City of Ottawa Helmet Policy and file staff pictures
City of Mississauga Arena Committee
CSA Z94.1-05 Industrial Protection Headwear- Performance, selection, care and use
Education Safety Association of Ontario (ESAO)
ORFA Arena Advisory Committee
Preventing Injuries from Slips, Trips and Falls - University of Florida
Town of Halton Hills DRAFT Helmet report
Worker Safety Insurance Board (WSIB)

Photo Credits: City of Ottawa

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HEALTH & SAFETY

Background

In 2003 a member of the City of Ottawa staff slipped and fell while performing maintenance tasks associated with ice flooding. The employee received serious injuries. Upon notification, the Ontario Ministry of Labour investigated and served orders to the City of Ottawa requesting a report to identify how we intend to prevent a recurrence.

As a result of this accident and other similar occurrences, Real Property Asset Management (RPAM), Program Properties in consultation with their Joint Health and Safety Committee (JHSC) decided to issue protective headwear to all staff tasked with performing work duties on ice. This decision was made in order to reduce the potential for serious head injuries, should staff fall again.

Head Injuries

Head injuries can be generally described within two separate categories, namely external (usually scalp) injuries and internal head injuries, which may involve the skull, the blood vessels within the skull, or the brain. Internal injuries are generally more serious in nature as they may typically result in concussion or in more extreme cases coma or death.

Standard Precautions When Working on Ice

When working on an ice surface, it is important to always work in a manner that reduces the potential for a fall. This might include;

- Taking the necessary time to walk safely,
- Keeping hands free of tools or materials,
- Holding firm and stable surfaces (such as the boards)
- Wearing approved safety footwear, as required by the City, with footwear accessories such as pull over cleats and/or
- Wearing approved protective headwear.

Personal Protective Equipment including Protective Headwear

Wearing approved protective headwear while working on ice surfaces makes sense. Occupational Health and Safety Division recommend that City staff and/or contractors tasked with maintenance activities on an ice

surface should follow the standard precautions outlined in this Bulletin to minimize the potential for serious head injury, should a fall occur.

While RPAM management initially provided a limited number of staff with CSA approved hockey helmets, further consultation with the RPAM JHSC recommended approved protective headwear that meets ASTM 2040-02 Standard Specification for Helmets Used for Recreational Snow Sports. While the committee based their decision in part on compatibility of accessories such as eye and hearing protection, the ASTM 2040-02 provides other advantages. By design, these devices provide a high level of protection by combining force displacement and impact attenuation properties. A helmet that meets this specification will help reduce the risk of some types of head injuries.

Proven Effective

RPAM staff have recently observed the rewards of wearing such head protection. A recent fall on ice occurred and the worker experienced significant head impact on the ice surface. The protective headwear he was wearing was damaged significantly, yet the worker experienced no head injury.

Should A Fall Occur

Should a fall occur ensure your supervisor is notified.

Supervisors are required to report incidents and accidents in accordance with City of Ottawa Occupational Accident/Illness Reporting Procedures available on MOE at:

http://intraprod/resources/services/occ_health_safety/procedures_en.html

For Further Information

Always refer to manufacturers' instructions for fit, care, use and maintenance of these devices. Contact your supervisor, JHSC member or OHS Division should you have any further questions or concerns.

