Ontario Recreation Facilities Association

Building Community Since 1947

Arena Artificial Ice Out Guideline

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Ontario Recreation Facilities Association

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Introduction

The industry has embraced the benefit of creating and maintaining Standard Operating Practices (SOP) for ice in activities through detailed data collection and checklists. Ice out activities have not always been given the same focus. Moving forward, the same attention to detail for ice out activities must be applied. This guideline provides an overview of required equipment, preparation activities and best practices for rinks with a concrete pad. Each step should be considered and adjusted to be workplace specific.

Note: All ORFA documents (links) referenced in this resource are identified at the end of the guideline.

Step One – Ice Out Planning Starts at Ice-In

A Certified Ice Technician (CIT) would have learned in the Ice Making and Painting Technologies (IMPT) course that creating an ice sheet requires planning and recording of details. The question of how much paint to apply to ensure user satisfaction and best results needs to be carefully considered. The next decision is how many staff will be available for ice out and what equipment or method will be used to remove the sheet. Regardless, building ¼ to 3/8 of an inch of ice before painting it will allow for an adequate buffer for the ice resurfacer when pulling ice. Reviewing the ice in log to reconfirm installation depths is the first planning waypoint for those tasked with removing the sheet.

Step Two - Define the Ice Out Date

Anticipation in a seasonal rink to the ice coming out is always high. Both management and frontline staff see the change as a time to decompress, recharge and prepare for the next season. Once the ice out date has been confirmed facility operations need to begin planning with a minimum 30-day preparation schedule. It is strongly recommended to plan an operational season post-mortem staff meeting. This should be an opportunity for all staff to identify issues, challenges or how the facility might operate more efficiently in the future. Consider what maintenance needs to be accomplished or what capital projects are scheduled to be completed. Doing this while the seasonal experiences are fresh will lend to a successful team meeting.

Step Three – Staff Schedule and Risks

It is important to appreciate that staff are coming off a long winter season. In addition, ice out will involve extended periods of ice scraping with the resurfacer which can raise the risk of operator safety due to complacency. Additionally, hearing protection requirements should be reviewed as these extended operational periods in an empty facility may raise the risk of operator long-term hearing damage. Facilities that use fossil fuelled ice maintenance equipment need to consider the importance of ventilation to reduce the risk to toxic air exposure. It is recommended that several staff be scheduled to scrape ice to speed the process. Creating an ice out schedule in partnership with facility staff will assist in completing the task as efficiently as possible. PPE is a must! Head, feet, hand, hearing and ice cleats should all be worn as required.

Step Four - Staff Workplace Specific Training Opportunity

Once the ice out date has been set consider this period to schedule time to train new or refresh senior staff on a variety of operational tasks. As shared in the ORFA Ice Making and Painting Technologies (IMPT) course, ice out is the perfect time to allow facility ice painters to hone their ability on setting out the surface while practicing brush or paint stick control. This practice allows an ice painter to gain confidence by being able to apply paint with no concern of making a mistake or worry of spilling ice paint. As there will be a need to change several ice resurfacer blades it is a perfect time to train new staff or assess senior staff on how the work should be performed safely. This time is also an opportunity to train new ice resurfacer drivers. New operators can gain equipment confidence and control in an unpressurized environment. Under the guidance of a

competent trainer focus can be placed on equipment control, blade setting and flooding.

Step Five – Order Ice Out Supplies

Ice out will quickly dull blades. There are several reasons for this but the biggest contributor will be dirt that will be tracked in from outside during the dumping process. A minimum of four (4) sharp blades should be on hand. Begin with measuring al the blades on site. Focus on using only blades that are near the end of their life-cycle. If blades are damaged during the ice out process, there will be less of a financial impact to the operations. Ice out is the most high- risk time for ice resurfacer conditioner wear and damage. Tire cleaning is essential after each exit to the outside. The ice resurfacer room floor must also be kept clean. Specifically, to Olympia's, it is common for operators to take off the existing runners and put on an old set so that damage/wear does not become an issue. Additional care must be given to Zamboni's as replacement of runners is a little more labour intensive and expensive. Remember driving around with a dull blade is a waste of operator time, fuel and places unnecessary wear on the ice resurfacer. Once the equipment starts to cut paint it will further impact blade sharpness. An 85 x 185ft ice sheet that is 1.5-inches will require 35-40 full ice resurfacer loads (125 cubic feet) to get the job done so having a good supply of sharp blades is essential. Ensuring that an extra set of edger blades are on hand is also recommended. Additionally, concrete pads will need to be cleaned with a citrus based cleaner so be sure to have an adequate supply on hand. If using an automatic floor scrubber be sure that scrub pads are fresh and in good condition. Plan to have an adequate supply of fuel on site.

Step Six – Comprehensive Pre-Ice Out Ice Resurfacer and Edger Inspection

Ice out will require extended use of the ice resurfacer and edger after a long season of operation. This stress requires that a competent equipment operator conducted a detailed circle check of both the ice resurfacer and edger. Any required repairs or maintenance should be completed well in advance of the set ice out dates in Step One. Consider spraying the equipment with a vegetable oil or other substance that will not damage the equipment's paint. This will greatly assist with clean-up at the end of the

Step Seven – Prepare a Collection and Accidental Escape of Ice Paint Residue Plan

Planning to dispose of ice paint is an important part of pre-planning activities. Ensure that the ice paint SDS information is on hand, up to date and reviewed by all operators involved in the ice out process. It is recommended that all facilities that use ice paints review the ORFA Recreation Facilities Environmental Waste Guidelines doc. beginning on page 3, to clearly understand the obligation to collect and dispose of used ice paint. The ORFA resource provides examples on how paint can be safely collected and disposed of as well as the potential for legal accountability for ice paint residue that escapes.

Step Eight – Reduce Ice Depth

Some operations will have reduced use schedules that will allow for some ice to be removed in advance of the actual ice out. High spots should be addressed and edges cut. While keeping away from known low areas as they will present a high risk for ice resurfacer wear and or damage. The ORFA ice build-up trouble area map above should be reviewed as a resource to create a facility specific awareness map. Be sure not to go below the facilities set ice thickness policy until all rentals are complete.

Step Nine – Warm the Sheet

Refrigeration plant operators should be prepared to "warm-up" the secondary refrigerant temperature to soften the sheet. Driving floor temperatures up to 30-31F will significantly soften the ice making it much easier to be cut.

Step Ten – Consider Pre-Drilling the Ice

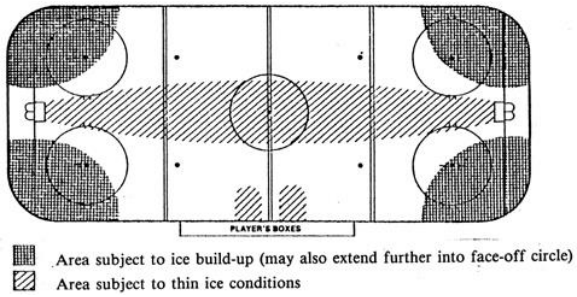
Using the same methodology as ice maintenance day some operations use a large wood bit and drilling into the ice ¾ of an inch at various locations (not near textile logos) will give an operator a visual depth marker as they drive around the ice surface. Some facilities fill the holes with red ice paint and allow it to freeze as an additional visual operator aid.

Step Eleven – Pulling Ice Textile Logos

Buildings that are planning to remove logos for reuse must develop a plan on when and how these materials will be removed and properly stored. Care must be given to not cut the material with the ice resurfacer. The edger should only be used to remove a logo if it is not to be used again. Review the ORFA Ice Logo Installation, Removal and Storage Guideline as it provides additional information on how best to complete the removal of logos.

Step Twelve – Pulling the Ice

Pulling the ice partially with the ice resurfacer and then using bucket equipped removal apparatus is the most common method used in the industry. Bucket equipment should only be used by highly skilled operators as dasherboard damage or surface scars from poor operation will not be easily repaired. Equipment borrowed from other departments or rented are often poorly tuned resulting in toxic indoor air quality. Be sure to test and monitor. The best approach to ice removal includes getting off the regular flooding pattern.



Equipment speed is not an issue when pulling ice but controlling speed is essential to operator safety. Lifting the conditioner in low areas and putting it back down while in full operation is considered acceptable. Olympia operators will often keep a used set of conditioner runners for ice out. Further, this is the time to measure all old blades and use only those that are near the end of their life-cycle. If dumping outside, if possible, be sure to barrier off the exit point from other vehicle traffic as operators will often exit without care as the task progresses. Another option that is gaining in popularity is to allow the ice to melt after the ice resurfacer has completed its work and then remove it with water suction equipment. Regardless of ice out method, remember that outside temperatures will impact the task. Unlike ice in, pulling ice when it is warm outside will help speed the process. It is also considered acceptable to open rink exit doors to help warm the building and reduce the risk of toxic air if fossil fuelled equipment is used.

Step Thirteen – Conduct a Dasherboard and Shielding Inspection

Once the ice equipment is no longer required a detailed inspection of the complete dasherboard system. Rinks with ice dams will need to be reviewed. Remember that replacing any caulking along the system should be planned for when the building has dried. This is also the time to ensure that all board ads are clean and in a good state of repair. Confirming if contracts will be applicable for the upcoming season will allow for removal and replacement of new advertisements. Record the inspection and any repairs. And, now is the time to plan to clean the boards, paint in the arena area and clean and repair seats!

Step Fourteen – Clean the Ice Maintenance Equipment

Clean the ice resurfacer and edger everyday. Ice paint will stain the equipment if left for extended periods. Facilities with hard water issues will see the ice resurfacer stained. This can be usually handled with a 50/50 mix of water and calcium/lime/rust remover solution. Spray the solution onto a small area and allow it to make contact for several minutes before wiping. Start at the bottom of the machine and work your way up. This process controls excess dripping of the solution which may permanently stain the machine. Use a clean cloth (micro-fibre) and lightly move it in a circular motion being cautious not to press to hard. Stubborn areas may need to have several applications applied. Once the stain has been removed rinse immediately with clean water to remove any chemical residue. A common mistake by operators is the use of dish soap to wash the unit. This should be avoided as the characteristics of this product is harsh and often removes wax and is known to damage paint. Always use a quality car wash soap followed by a quality wax. Consider the benefit of a quality marine boat wax. Prepare the equipment as per the manufacturers recommendations for long term storage. Remember to remove the ice resurfacer blade.

Step Fifteen – Dry the Building and Clean the Surface

It is important that the building be dried once ice out has been completed. Keeping the heat on, turn on ceiling fans, open the buildings doors or operating the dehumidification to help ensure that the building is properly dried will increase life-cycle while reducing the chances for mould to breed. Try and not letting the ice paint dry to surface. It should be removed using suction equipment in a wet state if possible. Trying to hand mop ice paint is difficult as it leaves a residue that will often streak. As it is recommended not to track any foreign matter onto the surface when ice is being it created it is as equally important to avoid walking through ice paint and tracking it off the surface into the facility. Power washing or high pressure spraying the floor is an option, but water control is essential as leeching under the dasherboards can promote mould and or rot. Again, the issue of paint residue being flushed into the sanitary sewer system or being uncontrolled outside the facility must be considered. Once the floor is clean and dry be sure to inspect the surface damage, cracks or heaving. Early detection will allow for adequate time to make professional, permanent repairs.

Step Sixteen – Monitor the Surface for Sweating

If there is frost build up under the floor the surface may sweat as it thaws. This condition creates an unsafe environment for dry floor events. Consider turning on the ventilation system and/or ceiling fans, continue to circulate the secondary refrigerant and/or turn on the dehumidification or building heat to help it dry. Note: A "sweating" surface could be an indicator that frost build-up below the concrete is occurring. As the perma-frost melts it leeches upwards contributing to the slippery surface.

Step Seventeen – Continue to Conduct Refrigeration Plant Checks

The plant may have been turned off, but it still needs to be monitored for pressure build up, leaks or other issues. See the ORFA Ice Arena Registered Refrigeration Plant Inspection – Off Season doc.

Step Eighteen – Schedule Equipment Maintenance

The season is over, but it is time to schedule all necessary repairs or maintenance of key components of the ice equipment. The refrigeration plant, ice resurfacer, edger, clocks, nets, spectator protective netting, sound and lighting systems, fire suppression, air or toxic monitors and all other arena bowl support equipment need to be inspected and ready for next season. The manufacturers owner's manual or applicable regulatory obligations will help guide the requirements or set obligations. See the ORFA The Importance and Benefits of Planned Facility Sensing Equipment Maintenance and Calibration of Sensing Equipment doc.

Step Nineteen – Order Next Seasons Ice-In Supplies

Now is the time to order up ice paint, logos and other ice painting equipment/supplies. Placing an order and stating a specific delivery date will help ensure you are ready for ice in.

Step Twenty – Record the Process

The last step in any task is recording in detail how well the process went, what could be done better

and any other important notes that will improve the activity next time.

Year-Round Rinks

Facilities that keep ice in year-round must plan for a "sheet brightening". Time should be scheduled to pull ½ - ¾ of old ice, brighten lines and logos and put in a fresh sheet. This process will significantly increase ice durability for months to come. Some buildings choose to cut down to the existing paint and then conduct a complete repainting

Sand Based Floors

Sand floor based rinks require additional planning to ensure no damage to secondary refrigerant piping occurs either by the ice resurfacer digging into the base or because of the weight of the equipment. Some ice can be removed using as ice resurfacer. However, most ice and paint will leech into the sand base. This will need to be addressed before the next ice in. Raking the ice paint and blending it into the existing sand and then leveling the sand over the piped will need to occur. Overtime, some contaminated sand will need to be removed and replaced.

Ice Out Worker and Equipment Risks

The guideline has identified several operator risks during the ice out process. The following highlights these and other potential risks to be considered when creating an SOP:

- Improper or non-use of PPE
- Increase chance of slips and falls on the ice or getting on/off the equipment
- Increase chance for entanglements as augers are prone to clogging during these extended driving periods – regularly washout all auger systems – never operate an ice resurfacer with auger safety guards not in place
- Increase chance for hydraulic system failure
- Fatigue and/or lack of concentration by the operator leading to dasherboard collision
- Increase chance for conditioner damage at ice resurfacer exit point

Conclusion

We hope we have identified Ice out planning is as important as ice in planning. Create checklists and standard operating practice documents to assist staff with this task. Now is the time to start considering what staff training and professional development to improve operations. See http://www.orfa.com/events

Resources

The following ORFA documents are referenced in this guideline:

- ORFA Facility Noise and the Potential for Long-Term Hearing Loss
- http://www.orfa.com/resources/Documents/librarydocs/guides_bp/FacilityNoise.pdf
- ORFA Guidelines for Indoor Air Quality
- http://www.orfa.com/resources/Documents/librarydocs/Guidelines%20For%20IAQ%20In%20Arenas%20Jul2015.pdf
- ORFA Recreation Facilities Environmental Waste Guidelines
- http://www.orfa.com/resources/Documents/librarydocs/guides_bp/Recreation%20Facilities%20Environmental%20Compliance%20Guidelines%20FINAL%20June2014.pdf
- ORFA Ice Logo Installation, Removal and Storage Guideline
- http://www.orfa.com/resources/Documents/librarydocs/guides_bp/Ice%20Logo%20Installation%20Removal%20%20Storage%20Oct2015.pdf
- ORFA Ice Arena Registered Refrigeration Plant Inspection – Off Season
- http://www.orfa.com/page-1862327
- ORFA The Importance and Benefits of Planned Facility Sensing Equipment Maintenance and Calibration of Sensing Equipment
- http://www.orfa.com/resources/Documents/librarydocs/guides_bp/Sensing%20Equipment%20Maintenance%20and%20Calibration.pdf