RISK MICHIGAN MUNICIPAL RISK MANAGEMENT AUTHORITY

THE RISK JOURNAL

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PROPERTY RISK MANAGEMENT, PART 6

Preventive Maintenance, Management Help Mitigate Losses

by Terry Van Doren, Senior Risk Control Consultant, and Cindy C. King, Director of Membership Services and Human Resources

Engineering studies have found that 62% of equipment breakdown losses were caused by lack of proper maintenance.

PERHAPS READERS HAVE heard the adage, "If you think maintenance is expensive, try neglect." When it comes to property risk management, it's difficult to overstate the value of preventive maintenance in avoiding or mitigating exposures and losses.

Repairs and construction are expensive enough; unforeseen or unplanned downtime can also cause significant disruption in the delivery of public entity services and lead to additional costs. Preventive maintenance of public property and facilities is essential to avoid incurring damage or even catastrophic loss.

An unexpected catastrophe

Sadly, in Michigan, we need to look no further back than the 2020 collapse of Edenville Dam to understand the importance—indeed, the necessity—of proper facility maintenance. A report by the Michigan Department of Environment, Great Lakes and Energy (EGLE)[1] noted that the May 19, 2020 catastrophic failure of the dam was "in many ways the consequences of inadequately investing in infrastructure."

Fires, equipment failures, and structural problems cause billions of dollars in property damage in the U.S. each year.

According to *GeoQuest*,[2] "The incident serves as a stark reminder of the potential consequences of neglecting infrastructure maintenance and the importance of adhering to safety standards."

While the collapse of this dam was extraordinary, failure to properly maintain a building, structure, or facility can lead to serious damage and loss.

Care and upkeep of facilities

A corollary to preventive maintenance is developing plans for proper care of members' facilities and buildings before the need arises.

Capital improvement plans are a useful financial planning tool, generally forecasting needs out over a 3- to 5-year horizon. Like capital improvement plans, asset management plans identify the life expectancy and maintenance needs for each facility, enabling the entity to properly budget for maintenance, repairs, and/or replacement.

Across the United States, fires, equipment failures, and structural problems cause billions of dollars in property damage every year. Many losses could have been prevented with consistent facility maintenance and routine safety measures. Although national databases do not track catastrophic property losses caused by poor mainte-

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1 https://www.michigan.gov/egle/-/media/Project/Websites/egle/Documents/Multi-Division/Edenville-Dam/Report-Preliminary.pdf?rev=1da6d729c0ab45c59e25ed070ac38a87

2 https://www.mygeoquest.com/edenville-dam-failure-causes-and-consequences/

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nance as a single, countable category, maintenance failures are a major driver of serious property damage events.

Fire and other incidents

According to the National Fire Protection Association (NFPA), in 2024, fire departments in the United States responded to 1.38 million fires, causing $19 billion in direct property damage. Structure fires alone caused $15.3 billion in losses.[3]

These totals do not specify whether maintenance failures were the cause—but they show the enormous scale of fire risks.

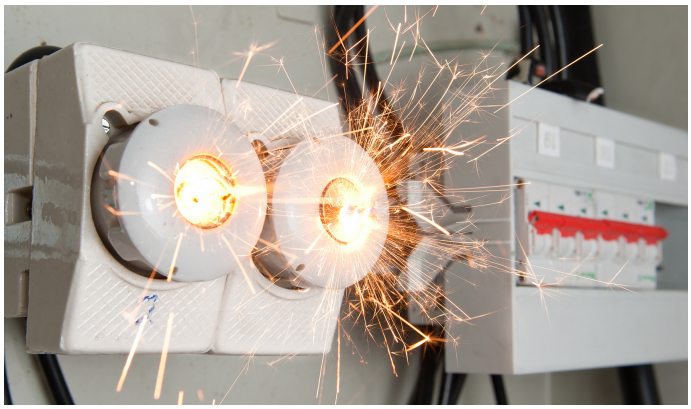
Property insurance carrier FM Global[4] reports that engineering studies found:

> 62% of equipment breakdown losses are caused by lack of maintenance, and

> These events account for about three-quarters of all equipment breakdown claims.

Such failures include boilers, HVAC systems, pumps, electrical distribution systems, and other critical building systems. When they fail, they commonly lead to fires, explosions, flooding, or long-term facility downtime.

Swiss Re's long-term review of "large-loss fires" (property damage exceeding $10 million)[5] found that:



Electrical faults are the leading cause of "large loss" fires with more than $10 million in damages.

> Electrical faults are the leading cause of these high-cost fires, responsible for approximately 25 percent.

> Electrical faults often stem from the deterioration of wiring, panels, and equipment that should be regularly inspected and maintained.

Protocols that avoid, mitigate risk

FM Global recommends strengthening infrastructure. "Communities need to prioritize schools, hospitals, roads, bridges, dams, water supply, sewer, sanitation, power, cellular, internet service, etc. Identify who is responsible for maintaining these services and talk to them about key vulnerabilities."

Proper preventive maintenance can also reduce the impacts of inclement weather, including heavy snowfall, strong winds, or significant rainfall. The Federal Emergency Management Agency (FEMA) notes that the "roof is your first line of defense in a high wind event" and provides guidance on how to protect property from severe winds.[6]

Michigan typically experiences a few heavy snowfalls each season. MMRMA's *Winter Weather Checklist* and FEMA's *Snow Load Safety Guide* provide more detailed information. FEMA recommends monitoring snow accumulation on roofs and removing snow when loads exceed 20-25 pounds per square foot. FEMA also recommends inspecting roof drains and downspouts before snow falls; the goal is to avoid ice dam formation.

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3 https://www.nfpa.org/education-and-research/research/nfpa-research/fire-statistical-reports/fire-loss-in-the-united-states

4 https://www.fm.com/insights/what-recent-catastrophes-can-teach-us-about-community-resilience

5 https://corporatesolutions.swissre.com/insights/knowledge/large-fire-losses-the-sources-of-ignition.html

6 https://www.fema.gov/sites/default/files/2020-11/fema_protect-your-property_severe-wind.pdf

GENERAL MAINTENANCE CHECKLIST

Structural & Envelope

- **Inspect roofs for ponding, membrane damage, and drainage issues.**
- **Inspect masonry/exterior walls for cracking, spalling, or loose materials.**
- **Verify public doors/windows meet egress, security, and operability needs.**

Safety & Code Compliance

- **Do monthly fire-extinguisher checks; document per NFPA 10.**
- **Inspect emergency lighting and exit paths, especially high-occupancy areas.**
- **Verify ADA compliance (ramps, hardware, restrooms).**
- **Inspect walks/entries for trip hazards; repair promptly.**

Interior & Vertical Transport

- **Inspect public meeting/court areas for flooring, seating, lighting, and damage.**
- **Verify security of evidence rooms, IT secure rooms, and armories.**
- **Test and maintain elevators/lifts per ASME A17.1.**

Grounds, Parks & Public Areas

- **Inspect parking lots for potholes/striping; prioritize critical facilities.**
- **Inspect playgrounds to CPSI/NPSI guidance; repair surfacing/equipment.**
- **Inspect trails, boardwalks, bridges, and lighting for safe condition.**

Environmental & Hazardous Materials

- **Verify SDS/HazCom compliance for stored and used chemicals.**
- **Inspect fuel storage for EGLE/DEQ compliance.**
- **Confirm asbestos management plans are current if applicable.**

Standards/Refs: International Property Maintenance Code; NFPA 10 & 101; ADA Standards; MIOSHA General Industry; CPSI Standards; EGLE Storage Tank Rules; ASME A17.1.

Be Prepared for the Many Risks of Sled Runs and Ice Rinks

by Terry Van Doren, Senior Risk Control Consultant

Injury-prevention research strongly supports the use of helmets and other protective gear, along with appropriate age restrictions, for winter activities.

WINTER IS HERE, AND SLED hills and outdoor ice rinks are popular destinations for residents across Michigan. We encourage members to ensure such attractions are properly constructed and maintained to protect against injuries.

Sledding

Primary sled hill risks are high-speed collisions, falls, and obstacles; children experience the highest injury rates. Safe, fun sled hill activity requires proper design, adequate run-out areas, and ongoing oversight.

Members should designate hills approved for public use and ensure appropriate slope and run-out characteristics without trees, benches, poles, or other fixed hazards. Design hills so they do not empty onto roadways, parking lots, or water bodies, and separate climbing routes from sledding paths to prevent collisions.

Regular inspection is essential. Before the season begins, check for debris, erosion, and surface hazards. In-season, conduct inspections daily when conditions change rapidly. Close hills when ice, low snow cover, or obstacles create unsafe conditions, and document all closures.

Ice skating

Injuries at outdoor ice rinks usually arise from falls, collisions, and surface defects. Inadequate surface maintenance, mixed-use conflicts (public skating versus hockey), and environmental hazards can contribute to this risk.

Children experience the highest injury rates for skating and other winter activities.

To help reduce risk:

> Erect rinks on flat, debris-free ground and remove rocks, stakes, and uneven patches before flooding. If hockey is allowed, firmly anchor boards and make sure there are no sharp edges.

> Perform flooding in thin layers after clearing snow and debris because heavy snowfall during flooding creates rough, unstable ice. Two inches of ice is generally considered adequate for safe recreation.

> Conduct daily inspections to check for cracks, ruts, frost boils, or exposed liners and repair these immediately or close until safe use is restored.

Supervision

Supervision is key, especially during high traffic, festivals, or other outdoor events near recreation facilities. Train staff to enforce rules, manage crowding, and spot obstacles and other hazards. Make sure participants have proper gear, including nonslip boots or ice claw boot attachments. For ice rinks erected on open waters, provide a lifesaving station with a throw rope or buoy. General public skating periods should not coincide with hockey playing.

Signage

Post sled hill rules such as: "Use hill at your own risk" and pertinent details such as "Steep hill," "Potential for collisions," etc.

For known sled hills not member-owned or operated, post signage such as: "Use at own risk, no supervision, no maintenance, steep slope falls may occur."

For skating, signs should list any rules such as skating in the same direction as posted, refraining from pushing or weaving through crowds, and avoiding food, drinks, or gum on the ice. Where relevant, other warnings could include "Slippery surface," "Thin ice may be present," or "Break-throughs may occur."

Consider other helpful signs to indicate age-supervision requirements, if helmets are required or encouraged, and any prohibitions on jumps, ramps, and inappropriate equipment.

Helmets and equipment

Helmet use during winter activities is strongly supported by injury-prevention research. Members may choose to require helmets for children under a threshold age or during hockey sessions, while strongly recommending them for all other skaters. Wrist guards, knee pads, and elbow pads provide added protection.

Refrigerated rinks using ammonia systems must comply with EPA reporting and emergency-planning requirements (EPA, "Ice Rink

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In addition to being a top producer of Christmas trees, Michigan has several notable entries on the National Register of Big Trees. Among them are a bur oak tree in Berrien County with a circumference of 325 inches. The current state champion is an eastern red cedar tree in Kalamazoo County, measuring 101' high with a crown spread up to 47 feet.

The *Risk Journal* is edited by Tamara Christie, Communications Manager, and published six times a year for members of Michigan Municipal Risk Management Authority. We welcome your feedback. To comment or suggest story ideas, please contact Tamara at 734 513-0300, 800 243-1324, or tchristie@mmrma.org.

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In "Insulation and Air Seating Guidelines," the US Department of Energy (DOE) suggests that to avoid ice dams, adequate attic insulation is a must, along with proper attic ventilation. Air leaks should be sealed. The DOE also recommends installing heat trace cables in high-risk areas, noting that certain architectural elements may create vulnerabilities.

Proper insulation and ventilation are a must to avoid ice dams that can severely damage roofs and underlying structures.

MMRMA is here to help

Members can log into our member portal and find Risk Control Bulletins for preventing pipes from freezing and bursting—a common source of water damage—and how to safely thaw pipes (if they do become frozen) while avoiding fire risk or other property damage.

Still other water safety prevention measures include installing leak detection equipment and using backflow preventers to prevent sewage backup during heavy rainfall events (ASTM E2128 "Standard Guide for Evaluating Water Leakage of Building Walls"). The June and August editions of the *Risk Journal* included articles on how members can prevent water intrusion.

Every facility is an investment in public service, and proper maintenance is a responsible, cost-conscious risk management tool to guard against property losses and protect member employees, residents, and financial resources.

Contact Membership Services for further guidance, including additional maintenance checklists for electrical, mechanical, and plumbing systems.

Risks of Sled Runs and Ice Rinks, continued from page 3

Ammonia" fact sheet). Fuel-powered resurfacing equipment introduces carbon monoxide risks if used in enclosed or semi-enclosed structures; proper ventilation, equipment maintenance, and operator training are essential.

Other considerations

> Plan for weather risks by monitoring windchill advisories, ensure adequate lighting for evening use, and regularly clear and treat walkways and approaches.

> Provide consistent, transparent communication, including clear "Open/Closed" indicators, reminders that conditions may change quickly, and instructions to report hazards or injuries.

> Share real-time updates on conditions and safety expectations on municipal websites and social channels.

> Establish written policies for design criteria, inspection schedules, maintenance responsibilities, user rules, closure authority, incident-reporting requirements, and annual review processes.

> Plan for emergencies, including first aid access, EMS coordination, and incident reporting for rapid response.

> Contracts with third-party groups, such as hockey clubs or event coordinators, should outline their responsibilities, require adherence to municipal rules, and include appropriate insurance provisions.

By establishing a written policy, maintaining logs of inspections and incidents, and annual performance reviews, members can manage winter recreation risks proactively and effectively for their community's benefit.