



MIIA Risk Management

Water Loss by Mechanical Failure Prevention Program

This program is designed to help prevent property water loss due to mechanical failures of water pipes, supplies, and appliances by conducting biannual inspections of your facilities as well as performing preventative maintenance. MIIA receives hundreds of thousands of dollars in claims each year due to mechanical failure. These claims can very quickly reach into the tens or hundreds of thousands if not detected right away.

Know Your Buildings

- Verify ages of plumbing fixtures and appliances: toilets, sinks, washers, refrigerators with water lines, water heaters, etc.
- Establish life expectancy and preventative maintenance standards; use manufacturers' manuals as guides where appropriate.
- Keep records of preventative maintenance and other plumbing repairs.
- Develop schematics for all plumbing and other utility shutoffs to quickly shut off water at the source in the event of a loss.
- Consider installing water sensing or flow alarms in vulnerable or intermittently accessed areas.

Signs of Leaking Pipes

- Signs of underground plumbing leaks include areas of wet soil, areas where grass or other plants are growing faster than in the surrounding areas, and unstable, spongy floors;
- Signs of leaking pipes in the walls include bulging walls, crumbling plaster, blistering paint, water stains, cracked or loose tiles and gaps in grout.
- Other indications of hidden water leaks are musty smells, visible mold patches, and unexplainable rises in water bills.

Heating Deficiencies

- Are there any areas of the building with main or secondary water supply lines with limited or no heat?

Program Instructions

- Conduct biannual inspections of each of your main buildings (town hall, library, offices, schools, etc.).
- Use the Water Loss by Mechanical Failures Prevention Corrective Action form to track the issues identified during the inspection.
- Verify ages of plumbing fixtures and appliances: toilets, sinks, washers, refrigerators with water lines, water heaters, etc.
- Use the manufacturers' preventative maintenance schedules to replace fittings, couplings, sealers, valves, or other parts before the end of their expected lifetimes.
- All items should be done every six months unless stated otherwise.
- Use time stamped photographic evidence of acceptable conditions and corrective action areas.

Perform Biannual Inspections

Plumbing Supply

- Visually inspect plumbing pipes; look for condensation around the pipes or an obvious leak and corrosion.
- Check all shutoff valves and levers to make sure they are in good working order.

Sinks/Toilets

- Inspect plumbing beneath sinks; ensure connections are secure and there is no evidence of corrosion on the pipes.
- Look for kinks in copper or plastic pipes. These could lead to pinhole leaks over time.
- Locate the water shut-off valve; inspect to make sure the water supply will shut off. Replace the valve if needed.
- Check drains and water pressure; periodically turn on water faucets to view the water pressure and ensure the drain beneath the faucet is working correctly.
- Inspect the flushing mechanism inside the toilet; the fill valve should shut off when the float reaches the proper water level. Replace the flapper or fill valve assembly if you notice intermittent or constant tank refilling when the toilet is not in use.
- Inspect the supply line; ensure the connection to the valve is secure. Operate the valve to make sure the water supply will shut off. Replace if needed.

Water Heaters - Factoid: 3/4 of all water heaters fail before they are 12 years old.

- Have a professional plumbing inspection of the anode rod at least every 2 years and annually once the warranty has expired. The rod will eventually corrode and leave the tank vulnerable to damage.
- Remove sediment by flushing the tank; sediment will build up faster in areas with hard water.

Refrigerator Water Ice Lines

- Proper installation of the icemaker supply line hose can prevent water damage. Tightly connect the hose to the valve. Avoid over-tightening.
- Ensure the valve connection is secure and check for kinks.
- Inspect the hose every 6 months; if kinks are present, replace the hose.
- Leave a 3 to 4-inch space between the back of the refrigerator and the wall to prevent the hose from crimping.
- When pulling the refrigerator out for cleaning or service, avoid getting the hose caught beneath the wheel.
- Locate the water shut-off valve; inspect to make sure the water supply will shut off. Replace the valve if needed.

Washing Machines

- Consider installing a lever-type valve to shut off the water supply between uses.
- Leave a 3 to 4-inch gap between the back of the washing machine and the wall to avoid kinking the hose near the valve connection.

- Inspect the water supply line hoses; check for cracks, kinks, or blisters which are typically found near the hose connection.
- Ensure that the connection to the valve is secure, but avoid over-tightening. Hand tighten first. Then tighten an additional 2/3 of a turn using pliers.
- Washing machine manufacturers recommend replacing washing machine hoses every 5 years.
- Consider reinforced braided stainless-steel hoses.

Drinking Water Fountains

Refrigerated drinking fountains have a typical useful life of 15 years.

In addition to disinfecting at least once daily, and weekly de-scaling, the following should be included in biannual inspections:

- Check supply and pump valves to ensure they properly open and close.
- Check water pressure – low pressure could mean a leak within the unit or in the supply. High pressure or spray could indicate debris blocking the screen.
- Clean debris from screens.
- Check to ensure the water is draining properly.

Troubleshooting tips:

- If water dribbles out the spout after you stop pushing the button or bar there is a problem with your valve. Other common leak areas include the drain gasket, cooling tank and quick connect push fittings.
- If your water fountain feels warm to the touch and/ or the fan is running constantly, the fan may be covered in dust or debris, the refrigerant may need to be charged, the relay could be defective or the relay connection could be loose.

Water Filtration Systems

Quarterly inspections should include:

- Check all mechanical components; valves, joints, and couplings on pipes both to and from filter system and gaskets and housings on unit/ system itself.
- Check for small leaks or moisture on or around system.
- Be sure when changing filters that you do not overtighten units. Use tools provided/ designed for your unit.

Check manufacturer's manual for life span and preventive maintenance recommendations for your system. The average life span for systems can range from three to ten years depending on type.

Sump Pumps

- Follow the manufacturer's recommendations for sump pump maintenance. These vary from running the sump pump every 2 to 3 months to a yearly cleaning before the rainy season.
- To inspect the sump pump:
 - Open the lid and remove debris that may be blocking the water inlet screen.
 - Pour approximately 5 gallons of water into the pump and watch the float valve rise.
 - As the float valve rises, the pump should turn on and the water should discharge through the outlet pipe.
 - Go outside and inspect the outlet pipe; water should be flowing from the pipe and away from the building.
- Install a battery backup system. Choose a system with a battery replacement warning. Replace batteries every 2 to 3 years.
- Most manufacturers recommend replacing sump-pumps every 7 to 10 years.

Drains

- All the drains in your building should be tested for flow rate. Slow drains or clogged drains should be power-rodded or hydro-jetted in order to restore proper function.
- You may want to consider a camera inspection of your drain lines to ensure they are in good working order and do not contain any root infiltrations and/or bellying in the lines.

Technology – Water Sensors

Advances in technology have created highly sensitive water detection sensors which can be installed around infrastructure and equipment where there is a risk of a high-volume water discharge in the event of a mechanical failure. There are currently sensors that can be wired into your existing alarm systems so that warnings can be sent to key staff at the earliest sign of water intrusion. As well, there are sensor programs that integrate with cellular technology to collect relevant data used to build predictive analytic models. There are also relatively simple sensor technologies designed to protect a single area of piece of equipment.

When considering water sensors, we recommend an initial assessment of a building's high-risk areas (ex: boiler rooms, in and around water heaters, pipes around external walls, labs, plumbing fixtures on upper floors, etc.). After high risk areas are identified, likely water migration low spots can be identified for strategic placement of the actual sensors.

MIIA has added water sensor technology to its annual Grant Program.