

Water and Sewage Losses

Water and sewage leakage in healthcare organizations can originate from many sources (e.g., domestic waterlines and systems; drains and drain lines, frozen pipes, sewage systems, leaky roofs and windows). During a water damage loss, organizations not only have to repair building damage, but they may also incur substantial losses associated with the replacement costs of damaged furniture, fixtures, medical equipment and valuable papers. Most importantly, a water damage loss can interrupt healthcare services and force organizations to displace patients.

Water and sewage damage exposure has been identified as the leading cause of property losses by frequency and costs in healthcare facilities according to HIROC's claims data.

COMMON CLAIM THEMES

- Failure of storm water sewer systems to accommodate the amount of rain water in a short period of time leading to water infiltrating the building.
- Failure to provide protection to domestic and chilled waterlines located over high-value equipment (e.g., MRI and CT scanners).
- Lack of awareness of staff, patients and visitors regarding proper disposal of items that clog drains (e.g., sanitary products and wet wipes).
- Failure to comply with National Fire Protection Association codes (e.g., inappropriately installed sprinkler heads).
- Improper maintenance of heat in buildings during extreme cold weather causing burst pipes and water damage to medical equipment and room contents.
- Inability to relocate high-value equipment from below grade (e.g. MRIs, CT scanners, computer server rooms, laboratory equipment).
- Inadequate training for staff regarding emergency response (e.g., inability to locate water shutoff valve, causing water to escape for over an hour and significant water damage).
- Inadequate and infrequent inspections and maintenance of pipes giving way to wear and tear.

CASE STUDY 1

A healthcare organization located in a remote area experienced a flood due to the Spring thaw. This resulted in the sewer system and ground water backing up into the buildings including the staff residences. Contents, including furniture and food, were affected and healthcare staff had to be relocated. Construction materials and supplies had to be transported from some distance and had to be coordinated with local government officials. Although local residents were employed by the contractor, out of area contractor staff were reimbursed for transportation and accommodation, adding to the cost of the claim. Repair and restoration work took almost eight months to complete.

CASE STUDY 2

A healthcare facility experienced a three-month long repair due to a pipe burst. The incident started with a 20-30 year-old copper pipe that burst and went unnoticed for approximately an hour. Upon investigation, it was determined that a brass connection had corroded and broke. The healthcare organization experienced a similar event several years prior in the same building. The original copper plumbing had been upgraded after the initial event; however, this section was missed. During the second event, asbestos within the building materials complicated the restoration and this added to the time and cost. Repairs were carried out over the winter holidays and over weekends to minimize disruption to the organization. Unavoidable delays were experienced that resulted in some mould development further increasing time and costs.

 *Canadian Case Examples*

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COMMON CLAIM THEMES cont'd

- Failure to provide appropriate heating for chilled and domestic water systems, particularly in penthouses and diesel generator rooms, and/or failure to close doors and louvers.
- Insufficient number and malfunctioning sump pumps contributing to significant damage to underground occupancies such as parking garages, elevators and main electrical rooms.
- Failure to prevent corrosion between dissimilar metal materials in domestic water piping.
- Failure to properly close doors to rooms that contain high-value equipment (e.g., polarizers), especially in winter.
- Significant restoration costs for property losses in remote locations due to increased expenses for things such as transportation of supplies, and skilled labour and expertise.
- Lack of backflow prevention valves to prevent sewer backups into the facility when municipal sewer lines and storm water systems become overwhelmed by heavy rains and widespread spring flooding.

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MITIGATION STRATEGIES

Critical Rooms

- Implement formal strategies to reduce water, sewage and liquid damage in critical rooms that include (but are not limited to):
 - Periodic checks of the room's envelope for potential leak sources and entry points;
 - Providing catch pans for supply and drain pipes located overhead;
 - Ensuring below grade areas have sump pumps in good working condition, are connected to emergency power, and are equipped with monitored high-liquid-level alarms;
 - Equipping below grade drains and sewer lines with check valves;
 - Providing drainage or leak detection in rooms with liquid sources.
- Consider rerouting:
 - Steam lines;
 - Liquid lines directly above high-value equipment (MRIs, CT scanners, etc.).

Domestic and Chilled Water Lines

- Implement formal strategies to increase the awareness and visibility of shutoff valves as well as domestic and chilled water lines for first responders (well-marked and visible shutoff valves, maintaining an up-to-date diagram or map of all water lines and shutoff valves including the direction of the water flow).

Below Grade Occupancies

- Implement formal strategies to reduce potential water runoff, flooding and sewer backup losses in below grade occupancies, including (but not limited to):
 - Installing sump pumps at points of water ingress or collection (i.e., low points or

around open floor drains near backflow prevention valve). These sump pumps should be a minimum of 50 gpm and should be connected to emergency power. Ensure that the power supply is appropriately sized for the pump. Test the device on a quarterly basis and before major storm events;

- Ensuring door thresholds and door and window seals are water impervious;
- Installing leak detection, which alarms to a constantly attended location, for high-value equipment areas and critical occupancies in basement or below-grade areas;
- Reviewing exterior grading to ensure there is an adequate slope away from buildings and openings;
- Reviewing downspouts to ensure they are extended away from buildings;
- Storing materials (e.g., paper records, documents and files) on shelves, racks, cabinets or skidded off the floor.

Sewer and Drainage Systems

- Implement formal strategies to ensure the optimal functioning of your site or facility's drainage system(s), including (but not limited to):
 - Becoming familiar with your facility's drainage system. Map the entire system to identify connections, water flows, system capacities and asset condition to quickly identify the source of drainage problems (e.g., blockages, seepage or ground contamination);
 - Equipping sewer lines and drain systems with backflow preventions (e.g., backflow

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prevention valve, designed to prevent a backup of municipal sewer lines from entering the facility, such as flash flood);

- o Ensuring all shutoff valves are well-marked and accessible;
- o Conducting scheduled preventive inspections of all basement floor drains and external drainage systems (e.g., ensure they are free from obstructions).

Preventive Maintenance Programs

- Adopt a standardized water and sewage preventative maintenance program that includes (but is not limited to):
 - o Exercising domestic water control valves annually;
 - o Checking and clearing HVAC condensate drains monthly;
 - o Checking and clearing roof drains quarterly;
 - o Testing sump pumps quarterly;
 - o Regularly checking connections of dissimilar metals for corrosion;
 - o Checking water pumps for excessive vibration;
 - o Checking water heaters for signs of corrosion.
- Implement a standardized winterization program that includes (but is not limited to) ensuring:
 - o Space heaters as well as any heat-tracing systems are maintained and working;
 - o Adequate heat is provided for sprinkler, chilled and domestic water systems, in particular for stairwells where exterior doors are present, diesel generator rooms, fire pump and sprinkler riser rooms, trailers and temporary housing and office structures and penthouses.

Emergency Response

- Implement a formal water, sewage and liquid leakage emergency response plan that includes (but is not limited to):
 - o Identifying the location of the main and critical valves;
 - o Labelling supply lines to indicate the direction of liquid flow;
 - o Identifying the location of mobile spill control cart supplies for first responders;
 - o Maintaining an up-to-date contractor list.
- Implement formal, multifaceted and targeted strategies to promote awareness of and support the timely and consistent compliance with the organization's water, sewage and liquid leakage emergency response plan by first responders (e.g., workshops, in-situ simulations and scheduled emergency skill drills; sharing of learnings and trends from industry, analysis of reported incidents and events), including (but not limited to):
 - o Identifying the location of sump pumps and backflow valves (if any);
 - o Identifying floor and building shutoffs for sprinkler systems;
 - o Locating domestic and chilled water systems;
 - o Utilizing a communication cascade to ensure management and remediation contractors are notified to assist with cleanup efforts.
- Implement strategies to ensure timely access to trained first responders for all shifts; ensure such staff have the training and authorization to:
 - o Investigate sewer backups and determine the source and severity;
 - o Shut manual backflow valves (if available) to stop backflow.

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