



Mitigation Steps for Existing Facilities

Mitigation steps can be taken to help reduce the severity and frequency of damage due to liquid losses. Shielding, leak detection and regularly scheduled preventive maintenance programs can help minimize this exposure.

High-Value Equipment

Definition: For the purposes of this section, high-value equipment can be defined as equipment with either high replacement value or high operational impact, if lost. This can vary greatly by scale, size and complexity of facility.

- Survey rooms and seal wall, roof and ceiling penetrations to reduce the potential for water intrusion.
- Where domestic and chilled water lines are present in ceilings above critical equipment, reroute or provide protection.
- Noncombustible pans can be used over high-value equipment. Pans should be provided with leak protection. Obstruction of ceiling sprinklers should be considered when installing pans.
- Where domestic and chilled water lines are directly above high-value equipment, lines should be provided with secondary containment, such as concentric piping. (Secondary containment should be drained to a safe location and provided with leak detection.)

Below-Grade Occupancies

Below-grade occupancies are susceptible to surface water runoff, flooding and sewer backup losses. To reduce the potential of loss, consider the following:

- Provision of sump pumps may be necessary in points of water ingress or collection (i.e., low points or around open floor drains near backflow prevention valves). These pumps should be a minimum of 50 gpm and should be connected to emergency power. Please ensure that the power supply is appropriately sized for the pump. Test the device on a quarterly basis and before major storm events.
- If external drainage systems are present, conduct monthly evaluations to ensure they remain free and clear.
- Review door thresholds and door/window seals to ensure they are water impervious.
- Provide leak detection, which alarms to a constantly attended location, for high-value equipment areas and critical occupancies in below-grade areas.
- Equip sewer lines with backflow prevention, e.g., backflow prevention valve, designed to prevent a backup of municipal services from entering the facility, such as in a flash flood.
- Review exterior grading to ensure there is adequate slope away from building and openings.
- Review downspouts and ensure they are extended away from building.

Domestic and Chilled Water Lines

- Ensure all shutoff valves are well-marked and accessible. Use PTFE-lined ¼-turn valves for floor shutoff.
- Post a diagram of the domestic and chilled water lines and shutoff valve locations for first responder use.
- Label supply lines for domestic and chilled water services indicating the direction of water flow.

Preventive Maintenance Programs

- Roofing systems: Quarterly inspect roofing systems. This inspection should include:
 1. Roof drains free and clear of debris
 2. Roof covering and seams in good condition
 3. Loose debris and materials that could cause roof damage (screws and nails) or that could obstruct roof drains removed
 4. Flashing properly attached
 5. Mechanical equipment securely fastened
- Sanitary sewer line: Quarterly clean main sewer lines using a pressurized water system.
- Winterization: ahead of freezing temperatures.
 1. Ensure space heaters and small room heaters are maintained and working.
 2. Confirm appropriate heat is provided for sprinkler, chilled and domestic water systems.
In particular, consider the following areas:
 - Top and bottom of stairwells where exterior doors are present
 - Diesel generator rooms
 - Fire pump and sprinkler riser rooms
 - Trailers and temporary housing/office structures
 - Penthouses
 3. Inspect and confirm good condition of non-freeze and dry pipe sprinkler systems.
 4. Drain all low points.
 5. Verify adequate air pressure is being maintained.
 6. Verify adequate antifreeze charge in non-freeze systems.
- Domestic and chilled water lines: Semi-annually inspect and exercise domestic and chilled water line control valves to ensure good working order of the valves.

Preparation and Emergency Response

Emergency Response

A written emergency response plan should be in place and training provided to the first responders.

- Include on the emergency response team at least the following personnel with alternates on all shifts:
 - Designated lead person
 - Someone designated to investigate leak and determine the source and severity
 - Someone authorized and trained to the shut valves to stop leaks
 - Someone designated to retrieve mitigation supplies
- Provide training on a semi-annual basis. Simulate emergency scenarios and evaluate action plans and response. First responders should be familiar with:
 - The location of floor and building shutoffs for sprinkler systems, domestic and chilled water systems
 - Electrical systems and how to de-energize critical pieces of electrical equipment
 - Mitigation efforts such as water cleanup, dehumidification and protecting equipment.
- Include liquid leak scenarios in the emergency response plan and training drills. Time is of the essence to limit damage.
 - Shut off the source, if possible.
 - De-energize electrical equipment, if necessary.
 - Begin cleanup of liquid.
 - Initiate repairs.
 - Investigate and evaluate any damage to drop ceilings, drywall, equipment and floor coverings.

- Check wall cavities for water. Do not try to dry insulation; it should be replaced. Loss experience shows this is a leading source of mold generation.
- Contact internal Risk Management to report the incident and potential loss.
- Contact HIROC Claims and fill out a claim form in the HIROC website as soon as possible for significant water escape/leak. This is to facilitate qualified experts in initiating assessment and accelerated drying as soon as possible.
 - HIROC Website, www.hiroc.com – log in to Subscriber Area, click “Report a Claim”
- For significantly large events, HIROC will contact the FM Global Claims Department.
- Consider providing supplies needed by first responders on a spill control cart. Cart supplies typically include the following:
 1. Wet vacuum
 2. Absorbent material
 3. Tarps
 4. 2-way radios – ensure units have fully charged batteries
 5. Flashlights
 6. Diagrams of roof drains and water supply lines
 7. Dehumidifiers
- Prequalify a restoration contractor. Consider the following items during the qualification process:
 - Response time
 - Geographical reach
 - Staffing
 - Capabilities such as:
 1. Water extraction and drying
 2. Dehumidification
 3. Mold and mildew treatment
 4. Electronics restoration and corrosion control
 5. Equipment availability
 6. References
 7. Liability insurance

Flood Prone Areas

Health care facilities located in a flood prone area should have a written Flood Emergency Response Plan (FERP). The FERP should consider mitigation as well as restoration activities prior to and after the flood.

References and Resources

FM Global publications and resources: fmglobalcatalog.com

FM Global Property Loss Prevention Data Sheets: fmglobaldatasheets.com

- Data Sheet 1-24, *Protection Against Liquid Damage*
- Data Sheet 1-28, *Wind Design*
- Data Sheet 1-29, *Roof Deck Securement and Above-Deck Roof Components*
- Data Sheet 1-52, *Field Verification of Roof Wind Uplift Resistance*
- Data Sheet 1-54, *Roof Loads for New Construction*
- Data Sheet 2-8, *Earthquake Protection for Water-Based Fire Protection Systems*
- Data Sheet 9-0, *Maintenance and Inspection*
- Data Sheet 9-7, *Property Conservation*
- Data Sheet 10-2, *Emergency Response*

Vendor List

Service Type	Contractor name	Contractor number
Plumbing		
Dehumidification		
Mold abatement		
Flood cleanup		
Roof repair		
Emergency power/Electrician		
Automatic sprinkler system		
Sewer		
General contractor		

Feel free to direct any questions to:

FM Global Account Engineering Department Representative for HIROC:

Ryan Doggart
Ryan.Doggart@fmglobal.com
(289) 221 5523

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