



Hartford Steam Boiler



Risk Solutions

PLC Technical Bulletin Flood Pre-Plan Key Points

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You have just learned that your property is in a 100-year flood zone. Perhaps your insurance company loss prevention engineer pointed that out and submitted a recommendation to develop a flood plan. Or maybe you saw a news story about flooding in another part of your city and you took it upon yourself to check with the local Planning and Zoning department and learned the bad news. You're not alone.

The Federal Emergency Management Agency (FEMA) notes that floods are the most common natural disaster in the United States. Fortunately, damage to property can be reduced and the likelihood of business continuity can be improved with proper planning and preparation. The following information will assist your efforts in the planning and preparation for potential flooding and can be used to aid in the develop an effective Flood Emergency Plan.

Chances are the insurance company recommendation quantifies the flood exposure in terms of potential depth of flood water that could enter your buildings. This was determined with information from construction drawings for the building or from an Elevation Certificate. The floor elevation was compared to the Base Flood Elevation (BFE) identified on the FEMA Flood Insurance Rate Map (FIRM). If the BFE is not identified in the insurance recommendation, it can generally be obtained from the FEMA Flood Map Service Center. <https://msc.fema.gov/portal>.

The FEMA web-site will prompt the user to enter a street address and then will pinpoint the location on the most current flood map. The map will also indicate the exposing flood zone. For example, the Washington Monument is in Zone X (outside a designated flood zone) but adjacent areas are 100-year and 500-year flood zones (see Figure 1). The nearest 100-year flood elevation is to the West and marked as having a BFE of 12.43-ft above sea level. Even if a building is not in a flood zone, if it is within 1,000-ft of a 100-year zone a flood plan should be developed. Flood boundaries are approximate and historically 25% of flood loss claims are from sites outside a designated flood zone.



Review Building Exterior

Having determined that there is a flood exposure and the extent of that exposure in terms of anticipated depth of water, it is time to start developing a plan. A review of the building exterior should be performed to identify potential points of water entry. Doors are the most apparent point of entry, but depending on the potential flood depth, windows could also be a point of entry. Any other openings in the building perimeter, such as utility entry points and below grade ventilation systems should be identified.

Basements

Buildings with basements may have additional openings such as cellar hatches and low-level windows. The review should identify materials or equipment located outdoors. This may include raw materials or other items needed for production activities, finished products, or motorized equipment at the facility. Mechanical equipment such as air conditioning condensing units, or electrical transformers mounted on a pad at grade level should be identified. Generally, transformers provided by the local utility will be above flood level; however, depending on when the transformer was installed, local area conditions may have changed and the location may have become part of a flood zone, which may be indicated on an updated flood map.

Figure 1

Protective Measures

Once the review has been completed, physical preventive measures should be identified. Protection for doors may consist of sandbags, for example; or flood gates may be provided for openings, but these should be professionally designed and fabricated. Low level utility openings in the exterior walls should be sealed. Any measures that can be implemented during or soon after plan development, such as sealing utility openings, should be performed to minimize actions needed at the time of an impending flood. Other activities will require planning, purchasing, and storage; such as determining how many sand bags are needed, obtaining them, and storing them. Holding areas such as catch basins, drains, and drainage ditches should be identified and continuously maintained. Before an impending flood event all holding areas should be evaluated.

Outdoor Equipment

Outdoor equipment should be secured or relocated to a dry location if portable or mobile. Tanks should be completely filled with product or water or preferably permanently secured to a concrete foundation as they could float away, potentially damaging anything in their path. If possible, outdoor equipment such as HVAC condensing units should be protected. This can be done by the construction of a water-tight enclosure around them. If that is not possible, flood recovery planning may need to account for unit replacement after flood waters recede.

Utility Services

Flood planning will also need to address interruption to utility services such as gas, electricity, communications, and data. Loss of electricity may occur as a result of power loss at the utility level or could be localized to the on-site transformer that becomes submerged in water. Prior to evacuating a building ahead of an imminent flood incident and if time permits, all equipment should be shut down and circuit breakers opened. Natural gas line valves should be closed. The impact of the loss of electricity or gas on maintaining building heat should be considered in cold climates or conditions. Equipment in the building that can be relocated, such as computers, should be moved above expected flood levels or taken off-site, if appropriate. This should apply to hard-copy documents also. If computer operations are essential to business operations, an IT Emergency Plan should be developed. Fire protection equipment should be maintained in an operational condition.

Operational Planning

Operational planning should be undertaken to reduce business disruption. Identify operations, processes, or equipment inside the building that will be most important to business recovery after the event. Identify key employees who are necessary for operational activities to determine their availability and a means to return them to the facility after the event. This may be affected by the impact of the event on employee families. Consider assisting employees with family emergency planning. Establish a means of communicating with employees during and after the event. Ensure that arrangements are in place, preferably through emergency contracts, with key vendors and contractors. This may include raw material suppliers, equipment maintenance vendors, and building contractors. If the facility has an emergency generator that will be utilized to maintain emergency power for essential equipment, ensure a fuel supply contractor will be available. Ensure that an electrician will be available to perform emergency repairs and restore electrical systems, as well as an HVAC contractor for air conditioning equipment. Many businesses will establish contracts with a flood recovery and clean-up vendor. It may be necessary to develop a separate Business Continuity Plan.

Emergency Supplies

Planning activities should address emergency supplies that may be needed after the event such as emergency lighting, portable generators, water pumps or vacuums, tarps, squeegees and mops, fans and dehumidifiers, shovels, and hand tools.

In the days leading up to a flood, all emergency supplies and equipment should be checked for completeness and operability. At the time of an impending flood, it will be necessary to monitor weather conditions and decide when to implement physical actions such as placing sandbags, whether it is possible and appropriate to leave critical equipment operational, and when to evacuate the building. If critical or emergency team employees are to remain on-site during the flood, emergency supplies such as food, water, flashlights, rain gear, and blankets, should be available for them. (Maybe even life jackets!)

Recovery Operations

When it is safe to return, the site should be secured and a Command Center established to direct recovery operations. The building(s) should be surveyed to assess damage and look for unsafe conditions such as downed electrical wires or leaking gas lines. The appropriate utilities should be promptly notified. The building enclosure should be secured as needed. Based on conditions found, contractors should be called in for necessary repairs. Key employees should be recalled for restoration of equipment and operations as appropriate. The restart of electrical and gas systems and equipment should be closely coordinated with utility service personnel and equipment vendors or contractors. Restarting equipment without proper preparation, such as drying out electrical cabinets and motors, could result in significant damage or personnel injury.

Salvage Operations

Salvage operations should begin as soon as possible and should include relocation of contents and equipment to higher elevations to prevent further damage, covering building contents with tarps when exposed to rain and weather, and separating damaged goods from undamaged goods. Remove standing water, then clean and dry the equipment. Dehumidification operations may be needed, as mold can already be forming. Check and clean roof drains, storm drains, and retention ponds. Ensure all fire protection systems are operational.

After normal operations have been resumed, the plan should be critiqued and updated to implement lessons learned from the event.

References

See Every Business Should Have a Plan. <https://www.ready.gov/business/implementation/emergency>

Department of Homeland Security (DHS) – Ready.gov Free Publications. <https://www.ready.gov/publications>

The National Flood Insurance Program. Federal Emergency Management Administration. <https://www.fema.gov/national-flood-insurance-program>