A technical reference bulletin by the Risk Control Services Department of the Glatfelter Insurance Group

GLATFELTER PUBLIC PRACTICE SM
A Division of Glatfelter Insurance Group

RISK COMMUNIQUÉ

Hurricane Preparedness and Response for Water and Wastewater Facilities

Hurricanes have the potential to cause significant disruption in the operations of water and wastewater facilities. In order to minimize the potential for a public impact and to provide continuity of operations the following actions should be considered before and after a hurricane impacts your facilities. Each facility should have a site specific Emergency Response Plan.

General

1. Identify and schedule emergency operations and cleanup crews. This could consist of heavy equipment and extra personnel to assist in cleanups after the storm.
2. Adjust work schedules so that key staff members are onsite or can be reached to keep all services operational if the facility remains online, or to shutdown and startup facilities, if and when necessary.
3. Notify State and Federal Agencies (FEMA and others) of location and telephone numbers of the emergency personnel owner/operator for the water system operations. For public water systems, be sure to line up contacts to request emergency water supply, if necessary.
4. Review your emergency response plan and make sure it and contacts are current.
5. Notify ahead of time, and set up clear lines of communication with local police and fire departments in case of an injury or other emergencies. Request that local law enforcement check on any water staff that remains onsite at the water system. If communication channels are down with these sites, this check needs to continue on a routine basis until communication channels are reestablished.
6. Establish contacts to request emergency water supply, if necessary. This may include a delivery of purchased water from another potable water supply.
7. Make arrangements with the local power utility to be prepared to restore power to the water system as a priority customer.
8. Pre-arrange to purchase materials and supplies and to borrow or lease heavy equipment needed to make repairs to the water system. This could include piping, valves, chemical feed-line tubing, and hydrants.
9. Make arrangements to have materials and chemicals delivered to your location as soon as it is safe and you are ready for operation.
10. Establish which media you will use for customers to access information and press advisories. Be sure to prepare customers for possible boil water advisory status:
    a) Have a “Boil Water Notice” prepared, including multilingual.
    b) Have emergency disinfection of drinking water procedures prepared for customers.
    c) Have “Shelter-in-Place” guidelines ready in case of release of hazardous materials. This is information to be provided to the public that may need to remain indoors.
11. Stock up on first-aid supplies, batteries, flashlights, and cellular phones or other wireless communication devices. Check all normal and emergency communication equipment and charge or replace batteries.

This is a sample guideline furnished to you by Glatfelter Public Practice. Your organization should review it and make the necessary modifications to meet the needs of your organization. The intent of this guideline is to assist you in reducing risk exposure to personnel. For additional information on this topic, you may contact your GPP Risk Control Representative.

12. Stock an adequate supply (one week) of non-perishable food and water for any essential persons that remain onsite or are considered first responders to the water system.
13. Establish alternative transportation strategies for rotating core employees to the facility if high water prevents travel. Personnel should bring a jump bag with them, which contains change of clothes, sleeping bag, flashlights, extra batteries, medications, and other essentials.
14. Make sure all essential personnel are trained to shut down and start up system in case of emergency.
15. Notify the Emergency Management Agency (EMA) and the Water/Wastewater primacy agency for your State if a plant is taken off-line or you are unable to operate the water system. Be sure to obtain the EMA and primacy locations before any potentially known disasters occur such as a hurricane.
16. Review distribution maps to ensure they are up-to-date with isolation valves properly identified. Extra copies may be necessary for staff working in the field.

Grounds and Common Areas

1. Inspect water system source and treatment facility for security concerns. Test backup lights and generators.
2. For all water systems, check backup pumps and controls.
3. In addition to regular preventive maintenance, all systems (surface, ground, and purchased) should check backup chemical feeders, all pumps, and motors. Verify that spare pumps, motors, and other necessary spare parts are available.
4. Check manual controls and oil levels.
5. Fuel and service vehicles. Stock service vehicles with equipment and supplies, and move service vehicles to high ground or temporarily locate them out of the threat of damage.
6. Have sufficient supplies of sand bags available and sandbag the entrances, the area around critical equipment, and other critical areas.
7. Ensure that emergency electrical generators are not located in flood-prone areas of the facility. Obtain extra fuel for generators. Ensure adequate number of generators for water systems that require generators for wastewater and water pumping operations.
8. Board up all windows and doors to prevent wind damage.
9. Shut down exposed pipes at waterway crossings to prevent loss or contamination of potable water if the pipes break. Isolate/valve-off portions of the water system that appear to be more prone to damage. This should be performed as a last measure since service may still be needed immediately prior to the storm event.

Administration, Lab Buildings, and Relocation of Movable Assets

1. Secure important records in a well-protected location, including plant operations manual and water system mapping.
2. Remove all sensitive laboratory equipment from the flood zone, where possible. Remove portable electrical equipment and small motors from the flood zone.
3. Protect computers from potential damage.
4. Check bacteriological sampling materials. Be prepared for increased or special monitoring after the storm.
5. Remove or store furnishings in a safe place, when practical.

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6. Disconnect electrical power to the water system building, workshops, or offices if possible.

Treatment Plant and Pumping Stations

1. Run diagnostic tests on Supervisory Control and Data Acquisition (SCADA) and control systems.
2. All pump stations should be in a well-drained area and be designed to remain in operation during flood events. If not, the pumps should be shut down and protected from electrical damage if they should become submerged. After any major storm event, check raw water intakes to minimize any debris or other materials which could enter. Ensure operators and staff are familiar with manual operations within the system should SCADA become inoperable.
3. Any wells that become submerged must be disinfected prior to returning to service. Check with your State Primacy Agency for additional requirements prior to lifting any boil water notices.
4. Check that all chemical bulk storage tanks are properly labeled to include chlorine cylinders and chemical mix tanks. This will help in identification should these items be washed or wind-blown away.
5. Be sure all dry chemicals are stored off the floor in a dry room that is protected against flooding and water from floors, walls, and ceilings.
6. Check chemical inventory. A storm event could cause a greater demand for disinfectant to address broken waterlines and increases in turbidity, so more disinfectant and coagulant chemicals may be required. Verify that the current supply of calcium hypochlorite (if used) is adequate for this potential increased use.
7. Fill all storage tanks with water to prevent floating or falling from wind forces. This will also help in maintaining pressure throughout your distribution system.
8. Remove or move chemicals to a safe area. If chemicals are removed from an underground or above ground tank, fill the tank with water, if possible, to prevent floating.
9. Remove fuel from underground storage tanks to prevent contamination and loss of the fuel. If possible, move above ground fuel storage tanks to a safe, high area. Fuel will be needed for emergency and plant vehicles until new supplies arrive. Prepare for a one week supply, if possible.
10. Remove electrical motors, where possible. If not, wrap the motors in plastic and seal as tight as possible in order to protect the motor from silt, mud, and dirt. Any electrical motors that are submerged should be cleaned and dried prior to start up to prevent damage.
11. Remove shop tools and electrical hand tools from water system facilities.
12. Monitor tank levels. Fill elevated and ground storage tanks to full capacity. Storage tanks should be valved off from the distribution system immediately prior to the storm event to prevent loss of water during the storm.

Post Hurricane Activities forWater and Wastewater Facilities

EPA's Water Security Division has developed a checklist and guidelines to assist drinking water and wastewater facilities recover from hurricanes. Recognizing that water utilities will want to restore operations (e.g., regaining adequate pressure and disinfection) as quickly as possible, water facilities should consider the following steps in recovering from severe weather conditions.

General

1. Line up and schedule emergency operations and cleanup crews.
2. Maintain contact with State and Federal Agencies (FEMA and others) of location and telephone numbers of the emergency operating center or command post for the utility.
3. For public water systems, be sure to line up contacts to request emergency water supply, if necessary.
4. Consult public health officials and your primacy agency for public notifications (i.e., boil water, do not drink).
5. Notify customers and media where to access information and press advisories.
6. Arrange for food and water for the crews.
7. Maintain clear lines of communication with local authorities, such as police and fire, in case of an injury or other emergency.
8. Make arrangements with the local power utility to restore power as a primary customer.
9. Make arrangements with local companies to purchase materials and supplies and to borrow/lease heavy equipment needed to make repairs to the plant.
10. Confirm with local companies that materials and chemicals can be delivered to the plant as soon as it is safe and units are repaired and ready for operation.
11. Plan for appropriate disposition of personal protection equipment (PPE) and other equipment.

Grounds and Common Areas

1. If possible, resupply inventory of emergency repair equipment and supplies (i.e., sand and sandbags, hand shovels, power equipment, fuel, batteries, flashlights, portable radio, first- aid kits, etc.).
2. Keep service vehicles stocked with equipment and supplies.
3. Keep all vehicles and emergency generators fueled.
4. Keep service vehicles on high ground (above expected flood crest).
5. Maintain communications equipment and charge or replace batteries (i.e., two-way radios, cell phones, walkie-talkies, pagers, etc.).
6. Sandbag critical areas.
7. Coordinate debris removal.
8. Shut down exposed pipes at river crossings to prevent discharge of raw sewage or to prevent loss or contamination of potable water if the pipes break.

Administration and Laboratory Buildings

1. Keep portable electrical equipment and small motors from the flood zone.
2. Keep all sensitive laboratory equipment from the flood zone, where possible.
3. Keep or store computers in a safe area.
4. Keep or store all important records in a safe area.
5. Keep vital records such as built drawings, wiring diagrams, etc. to the emergency operations center or command post until normal operations resume.

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6. If electrical power has been disconnected, make arrangements with the local power company to restore as a primary customer.

Treatment Plant and Pumping Stations

1. Once flood waters recede, work with the power company to restore power.
2. Keep chemicals in a safe area.
3. Sample appropriate system elements (storage tanks, filters, sediment basins, solids handling) to determine if residual contamination exists.
4. Inspect electrical motors for damage caused by silt, mud, and dirt getting into the windings. Replace electrical motors if damaged in the storm.
5. Submerged motors should be washed with clean water and dried, and in most cases restored to service.
6. Inventory all shop tools and electrical hand tools in the emergency operations center or command post.
7. For drinking water systems if possible, continue to maintain elevated storage at full capacity as appropriate.
8. Monitor chlorine residuals and system pressure as soon as you can safely gain access to the system and its control facilities.

The above information is provided courtesy of the US EPA. Other emergency operation guidance documents are available on the US EPA website.

