Emergency Response Checklist

Flood

Overview
Flood events can emanate from a variety of sources including severe weather, tropical windstorm, and stalled or prolonged weather fronts. While locations exposed to these type events are more at risk, flooding can occur in many areas with minimal notice. The risk is exacerbated when facilities are located nearby and within low elevation of flooding sources such as rivers, creeks and basins, and may impact a wide area outside of your direct location including disruption to key infrastructure, creating business interruption potential.

The company should prepare a written Flood Emergency Response Plan (FERP) that states the type of preparation and response that is required by the Plant Emergency Organization (PEO) or external public and regulatory authorities. The plan should provide clear instructions, similar to those listed below, for employees to follow during an emergency event. The types of events which should be reported will be based on your specific operations, and may extend beyond life safety to include operational impacts and business continuity disruption events, along with crisis events that could generate significant property damage. These same scenarios may also be used to tailor recovery and business continuity plans as warranted.

Action to Take Prior to Flood Season

The following general checklist should be tailored to processes/operations, protection features and potential impact at your particular facility and can be used in developing your Flood Emergency Response Plan for use during an impending flood event:

Plant Management/Emergency Team

1. Develop a Flood Emergency Response Team as part of the Plant Emergency Organization.
2. Review the Flood portion of the Natural Hazard Property Loss Control Program and make any updates as required.
3. Prepare and maintain a scaled plan or diagram of the facility that clearly shows the location of all fire protection and other emergency equipment.
4. Obtain and review applicable flood maps for each location and evaluate flood susceptibility of each building.
5. Pre-qualify and pre-commit as many repair and service contractors as possible, including both local and national firms.
6. Obtain multiple suppliers for critical building components, equipment and stock necessary to resume operations/business.

7. Obtain the home telephone numbers of executives of all committed contracting firms, utilities and other services critical to resumption of operations.
8. Establish good credit with service providers, suppliers and contractors. Good credit and cash speak loudly in difficult times.
9. Establish and maintain good relationships with local police and fire departments.
10. Understand your energy needs and make arrangements for backup utilities and fuel sources where possible. Consider emergency generators and alternative fuel sources.
11. Identify alternative means of transportation and alternative routes for all critical personnel, services, suppliers, contractors, etc.; and establish relationships with lease and rental companies.
12. Develop a phone directory for critical suppliers, contractors, services, etc. Obtain phone books from surrounding major cities in the event you need to obtain services and supplies from surrounding areas.

Plan for Facility Security after a Storm

1. Buildings and Structures
   a. Review the structural integrity of each building and structure foundation including physical damage, etc.
   b. Check any flood doors, gates, shields or barriers for proper operation and water tightness including latches and hardware. Where possible, brick up lower building openings susceptible to flooding.
c. Evaluate the need for floodwalls, levees or dikes.

d. Inspect sign, conveyor and stack supports, guy wires, cables, and anchorages to ensure they can withstand possible erosion and heavy water flow conditions.

2. Emergency Equipment

a. Have plywood and sandbags available to barricade floodwaters.

b. Make arrangements for several forms of emergency communications, including cellular phones, two-way radios, ham radio operators, etc.

Action to Take Once a Flood Warning Has Been Issued

Plant Management/Emergency Team

1. Assemble the Plant Emergency Organization along with its supplies and equipment at a designated safe location onsite. Consider the following:
   a. Emergency lighting
   b. Emergency generators
   c. Portable pumps and hoses
   d. Lumber and nails
   e. Grease or other metal protection
   f. Tape for windows, doors and other openings
   g. Sandbags
   h. Squeegees and mops
   i. Fans and dehumidifiers
   j. Caulking compound
   k. Tarps
   l. Manual and power tools
   m. Shovels, axes, etc.
   n. Saws and chain saws
   o. Emergency telephone list(s)

2. Ensure that the Plant Emergency Organization has the following:
   a. Nonperishable food
   b. First aid equipment
   c. Lighting
   d. Two-way communication equipment
   e. Stored drinking water
   f. Blankets
   g. Appropriate clothing including rain gear and boots

3. Establish emergency communications methods.

4. A designated member of the Plant Emergency Organization should monitor weather and flood reports. The Army Corps of Engineers can provide predictions of river levels and status of dams and levees. The National Weather Service (NWS) is a good source of weather information.

5. Notify equipment repair and/or replacement suppliers.

6. If necessary, shut down operations and processes safely in accordance with OEM recommendations. Drain open tanks of combustible, flammable or hazardous liquids to approved, sealed containers.

7. Release non-essential staff, or direct to a designated safe location.

8. Shut off all flammable and combustible liquid piping and gas lines at the source or entry into the property to reduce the likelihood of release if pipes are broken. When equipment or processes must be kept in operation, service to all other areas of the plant should be secured using isolation valving. Pipes should be properly supported and protected from floating debris.

9. Turn off non-essential lighting, machinery and equipment. Anticipate power outages and surges; be prepared to shut down susceptible systems such as computers. De-energize equipment which may become submerged. Take care not to impair emergency equipment such as electric motor driven fire pumps or fire alarms.

10. Back up important computer data and records and store backups in a safe, elevated location not subject to flooding.

11. Protect important paper records from flooding, rain and debris, and relocate to an elevated location not subject to flooding.

12. When possible, move important equipment (including mobile equipment) and stock to higher elevations not subject to flooding. Use past flood history to select “safe” areas. If equipment and stock cannot be relocated or elevated, sandbags, tarps, or waterproof coatings, such as grease, may be applied to help protect exposed metal surfaces.

13. The Flood Emergency Team should remain onsite until the emergency has passed.

Buildings and Structures

1. Close and secure any flood doors, gates, shields or other flood barriers. Close any valves in building drains or plumbing to prevent back up into the buildings.

2. Place sandbags at lower building openings such as doors and other openings susceptible to flooding, and around important outdoor equipment, to divert floodwaters.
3. Fill aboveground and underground tanks with product or water to improve stability and minimize damage from flooding. Check tanks for proper anchorage and extend vent lines above level of expected flooding. Anchor and secure all portable containers of flammable or combustible liquids.

4. Anchor and tie down all small structures, equipment, storage, trailers, conveyors, lumber, process equipment, etc. to prevent movement by floodwaters. Move smaller objects inside if possible. Ensure all traveling cranes and bridges are secured in accordance with the manufacturer’s instructions, including setting all rail clamps and securing with wedges and cable anchors. Barricade important outdoor equipment with sandbags to prevent damage from floating debris. Move mobile equipment to higher elevations.

5. Brace unsupported structural members and foundations for structures/buildings under construction.

6. Secure electrical power to buildings in imminent danger of flooding.

**Emergency Equipment**

1. Ensure emergency generators, water and sump pumps, etc., are operational and fuel tanks are full.

2. Clean all catch basins, drains, and drainage ditches. Lower the levels of retention ponds. Ensure all sump pumps are operational and connected to emergency power.

**Fire Protection**

1. Inspect all fire protection equipment and leave in service. All fire protection equipment should be adequately anchored and protected from flooding and floating debris.

2. Ensure that electric driven fire pumps and fire alarms are not removed from service when any electricity is de-energized. When required, back-up diesel driven fire pumps should be considered for reliability.

3. Ensure all fire water tanks and reservoirs are full.

4. Verify all fuel tanks are full.

5. Recovery Action after a Flood

**Plant Management/Emergency Teac Recovery Operation**

1. The Plant Emergency Organization should be prepared and trained in recovery efforts specific for each location.

2. The site should be secured and a Command Center should be established to direct the recovery operation.

3. Damage should be surveyed and any fire protection impairments should be reported to the local fire department and/or police departments as soon as possible. Also, report any damages to your insurance company as soon as possible.

4. Survey for safety hazards such as downed electrical wires, leaking gas or flammable liquids, poisonous gasses, etc. Look for undermining and damage to foundations or underground piping, etc. Notify appropriate utility companies of damage as soon as possible. Use care around downed power lines and leaking fuel lines and consider providing barriers or watches.

5. Designated key personnel and emergency contractors should be called to coordinate and start repairs and salvage. Ensure that all contractors are familiar with the company’s policy program and share responsibility for fire safe conditions at all times.

6. Begin salvage as soon as possible to prevent further damage. Items to consider include:

   a. Relocating property to higher elevations to prevent further damage.
   b. Cover building contents with tarps when exposed to rain and weather.
   c. Separate damaged goods from undamaged goods.
   d. Make temporary repairs to prevent further damage.
   e. Fill eroded land areas, especially around building and structure foundations.
   f. Remove standing water in buildings, yard areas, etc.
   g. Clean and dry equipment with most critical objects receiving priority.
   h. Consider dehumidification of most areas, especially moisture sensitive equipment.
   i. Clean roof drains, storm drains, retention ponds, etc. and remove any debris.

7. Inspect all electrical equipment including exposed insulators, bus bars, conductors, and motors before reenergizing electrical distribution systems and equipment. Electrical equipment may absorb large amounts of water even if not submerged which may reduce its insulation resistance to dangerously low levels.

8. Inspect steam and process lines for wet insulation, which requires drying or replacement.

9. Contents of tanks, piping, reservoirs, boilers, process equipment, and cooling towers should be tested for contamination before use.

10. Mechanical equipment should be dried and cleaned and casings inspected. Shafts should be checked for alignment and lubricating systems should be flushed.

**Fire Protection**

1. Repair and return to service as soon as possible all fire protection including sprinklers, water supplies, fire pumps, special extinguishing systems, alarms and supervisory service, etc.
2. Ensure that all company policy programs, such as Hot Work (cutting & welding) and Smoking, etc., are properly supervised and enforced during salvage and repair operations. If automatic protection is impaired, arrangements for special fire watches should be made and notice should be provided to the fire department and the insurance company.

For further information, contact your local AIG Global Property Engineer.