

Hurricane emergency action plans

Hurricane season

Hurricane season runs from June 1 through November 30 in the northern hemisphere and from December 1 through April 30 in the southern hemisphere. Studies of recent hurricanes show that direct and indirect damage may be significantly reduced by implementing a comprehensive hurricane emergency action plan. An effective plan includes action steps addressing conditions before, during and after a storm. This guide outlines key elements to consider when reviewing an existing emergency action plan. Zurich Services Corporation risk engineers are available to assist in the development of a new plan. An electronic copy of this guide and other hurricane-related information can be obtained from Zurich's Hurricane Information Center at www.zurichna.com – Tools.

Pre-hurricane planning

A hurricane emergency action plan should be developed to include an emergency response team (ERT), storm tracking procedures, specific procedures for proper facility preparedness and shutdown, as well as coordination with local authorities such as police and fire departments, civil defense, the Federal Emergency Management Agency (FEMA) and others.

Have a predefined means for communicating with employees in the days and weeks following the storm. It is very important to provide contact information to employees well in advance of the storm. Some employers provide pre-printed laminated wallet cards with information. Information may include the use of a remote (hosted) company Web site or a toll-free telephone number hosted by a phone company located away from the storm zone. This will allow employees to get information and updates about the business, payroll and benefits information, and estimated dates for returning to work.

Many companies with locations in storm-prone areas ask employees to provide alternative contact information such as the phone number of an out-of-state relative or a personal e-mail address. This can help the employer verify the safety of employees following a storm and contact persons who can assist in the business recovery process.

Elements of a typical emergency action plan include:

- The ERT should consist of volunteer members willing to remain on-site during the hurricane (if allowed by local authorities).
- The members should be trained in all aspects of the emergency action plan and include representatives with decision-making authority as well as knowledge of facility operations. Security personnel may also be required.
- Carefully determine whether the location, design and building construction make it a safe place for ERT members to remain during the storm.
- Prepare an ERT supply kit that includes items necessary during and immediately after the storm.

This includes two-way radios, portable AM/FM radios, flashlights, lanterns, plenty of batteries, rubber boots, gloves, blankets or sleeping bags, first-aid kit, spare clothing and an adequate supply of shelf-stable food and water to last at least 72 hours.

- Anticipate loss of electrical power and municipal drinking water for several days following the storm.
- Conduct drills to test all aspects of the action plan on an annual basis. Ensure that the plan reflects current conditions at the location. Request feedback from ERT members to assess the effectiveness of the plan and to identify areas for improvement.
- Preplanning with local authorities should be done so resources and emergency action plan steps are coordinated.
- Storm-tracking procedures should be developed and include personnel capable of monitoring conditions using various media and equipment (e.g., radio, television, internet and portable phone).
- If the facility is in a known flood-prone area, specific flood response procedures should be developed as part of the emergency action plan.

Facility shut-down procedures

Procedures for proper facility preparedness and shut-down should be developed and tested on a regular basis. Such procedures typically include:

- Creating a backup of computer system data
- Removing any loose yard and roof debris
- Obtaining materials such as tarps, cables, straps, lumber and steel to anchor and/or brace yard storage, cranes and roof-mounted equipment
- Verifying emergency supplies for ERT members (e.g., non-perishable food, flashlights and communication devices)
- Obtaining an emergency generator (owned or rented) capable of providing power for life safety systems and critical equipment (e.g., coolers, freezers and communication equipment)
- Establishing methods of safely shutting down operations and protecting key equipment and materials. All hazardous and/or reactive materials should be identified, with provisions to safely store, neutralize or relocate the materials to a safe location.
- Protecting building openings with storm shutters, pre-fitted plywood or other coverings to minimize damage from flying or floating debris
- Covering key stock and equipment with waterproof sheets. Also, consider raising or relocating extremely sensitive items.
- Developing pre-arranged plans with contractors and vendors for equipment and supplies that may need to be obtained outside the affected area. In some cases, vendors and equipment may be kept available with a "retainer" fee.

Impending hurricane procedures

Typically, the National Weather Service provides 24- to 48-hour warnings before a hurricane is likely to approach landfall. Two terms are used with the National Weather Service notices:

Hurricane watch: Notice whenever there is a threat of hurricane conditions within 24-36 hours

Hurricane warning: Notice when hurricane conditions are expected within 24 hours or less

Once the warning has been issued, the following should be implemented:

- The hurricane action plan should be deployed, with the hurricane front being tracked and the ERT notified and on standby. Implement procedures to properly shut down operations.
- Examine the roofs and repair any damaged covering, flashing, gutters or drains.
- Remove any loose yard and roof debris and moveable equipment. In addition, provide proper anchoring of yard and roof-mounted equipment. Anything not secured may become a damaging projectile.
- For ERT members staying on-site, ensure all emergency supplies and equipment are on-site and in proper operation. Cash should be on hand for post-hurricane needs such as food, emergency supplies, employees and contractors.
- Inspect and verify that the fire protection systems such as fire pumps and sprinkler systems are in working order.
- If possible, all natural gas lines and main electrical feeds should be shut down to prevent any potential fires or equipment damage.

During the hurricane

The ERT and/or site security should only stay at the facility if deemed safe to do so. The following actions should be considered:

- Any critical equipment such as boilers or reactors remaining online should be continuously monitored.
- All electrical switchgear should be deactivated during a power failure to prevent reactivation of equipment before the electrical system is properly inspected for damage.
- The facility should be toured to look for damaged windows, doors, piping and roof coverings. Be alert for damaged equipment or wiring that may lead to fires.

After the hurricane

When allowed by local authorities, secure the site and begin the damage assessment to buildings and equipment. Separate damaged from undamaged materials. Damaged items should be documented, and repairs should be prioritized; and proceed immediately.

- All electrical systems, natural gas lines, fluid transfer operations, production and maintenance equipment and building structures should be examined by qualified individuals before returning to service.
- Damaged fire protection systems should be quickly repaired and put back into service as soon as possible. The Zurich Fire System Work Permit should be used whenever any fire protection system is impaired.
- Before conducting any repairs to the facility, make sure the facility safety programs are fully implemented. Contractors, like employees, should follow proper safety procedures at all times. All potential ignition sources such as smoking and hot work should be controlled by limiting smoking to designated areas and utilizing the Zurich Hot Work Permit System.
- Contact the local Zurich Services Corporation risk engineering office for any assistance.

Hurricane categories defined

The National Oceanic and Atmospheric Administration uses a disaster potential scale that assigns storms to five categories. This is the Saffir-Simpson hurricane scale, which estimates the potential damage as follows:

Category 1

Winds of 74 to 95 mph (120 to 153 km/hr). Possible storm surges four to five feet (1.2 to 1.5 m) above normal. Damage primarily to shrubbery, tree foliage and unanchored mobile homes. No real damage to other structures. Some damage to poorly constructed signs. Low-lying coastal roads inundated, minor pier damage, some small craft in exposed anchorage torn from moorings.

Category 2

Winds of 96 to 110 mph (154 to 177 km/hr). Storm surges of six to eight feet (1.8 to 2.4 m) above normal. Considerable damage to shrubbery and tree foliage. Some trees blown down. Major damage to exposed mobile homes. Extensive damage to poorly constructed signs. Some damage to roofing materials of building. Coastal roads and low-lying escape routes inland cut by rising water two to four hours before arrival of hurricane center. Considerable damage to piers. Marinas flooded. Small craft in unprotected anchorages torn from moorings. Evacuation of some shoreline residences and low-lying islands required.

Category 3

Winds of 111 to 130 mph (179 to 209 km/hr). Possible storm surges nine to 12 feet (2.7 to 3.6 m) above normal. Limbs torn from trees and large trees blown down. Practically all poorly constructed signs blown down. Damage to roofing materials of buildings, some window and door damage. Mobile homes destroyed. Serious flooding at coast and many smaller structures near coast destroyed. Larger structures near coast damaged by battering waves and floating debris. Low-lying escape routes inland cut by rising water three to five hours before hurricane center arrives. Flat terrain five feet (1.5 m) or less above sea level flooded inland eight miles (12 km) or more. Evacuation of low-lying residences within several blocks of shoreline possibly required.

Category 4

Winds of 131 to 155 mph (211 to 249 km/hr). Storm surges 13 to 18 feet (4 to 5.5 m) above normal. Flat terrain 10 feet (3 m) or less above sea level flooded inland as far as six miles (9.6 km). Shrubs and trees blown down, all signs down. Extensive damage to inadequately installed roofing materials, windows and doors. Complete failure of roofs on many small residences. Complete destruction of mobile homes. Major damage to lower floors of structures near shore due to flooding battering of waves and floating debris. Low-lying escape routes inland cut by rising water three to five hours before hurricane center arrives. Major corrosion of beaches. Massive evacuation of all residences within 500 yards of shore possibly required, and of single-story residences on low ground within two miles (3.2 km) of shore.

Category 5

Winds greater than 155 mph (249 km/hr). Storm surge greater than 18 feet (5.5 m) above normal. Shrubs and trees blown down, considerable damage to roofs of buildings; all signs down. Very severe and extensive damage to windows and doors. Complete failure of roofs of many residences and inadequately designed industrial buildings. Extensive shattering of glass in windows and doors. Some complete building failures. Small buildings overturned or blown away. Complete destruction of mobile homes. Major damage to lower floors of all structures less than 15 feet (4.6 m) above sea level within 500 yards of shore. Low-lying escape routes inland cut by rising water three to five hours before hurricane center arrives. Massive evacuation of residential areas on low ground within five to 10 miles (8 to 16 km) of shore possibly required.

References

Emergency Management Guide for Business and Industry

(Sponsored by a public-private partnership with Federal Emergency management Agency)

<http://www.fema.gov/pdf/library/bizindst.pdf>

State and Local Preparedness Guidance

(Federal Emergency Preparedness Agency)

http://www.fema.gov/preparedness/state_local_prepare_guide.shtm

Hurricane Background and Preparedness

(Federal Emergency Management Agency)

<http://www.fema.gov/hazards/index.shtm>

American Red Cross Hurricane Center
<http://www.redcross.org/news/ds/0305hurricane/>

EarthWatch Weather On Demand-StormWatch®
www.earthwatch.com/STORMWATCH/stormwatch.html

Hurricane Forecasts
<http://hurricane.atmos.colostate.edu/Forecasts/>

The Weather Channel Storm Encyclopedia
<http://www.weather.com/>

IBHS - Institute For Business & Home Safety
www.ibhs.org/

National Oceanic and Atmospheric Administration (NOAA)- National Hurricane Center (NHC) <http://www.nhc.noaa.gov/index.shtml>

National Weather Service
www.nws.noaa.gov/

NOAA Miami Regional Library
www.aoml.noaa.gov/general/lib/hurricbro.html

Sandbagging for Flood Protection
www.ext.nodak.edu/extpubs/ageng/safety/ae626w.htm

Zurich Services Corporation

1400 American Lane, Schaumburg, Illinois 60196-1056
800 982 5964 www.zurichservices.com

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