

2015 Hurricane & Tropical Storm Catastrophe Action Plan & Checklist



& ASSOCIATES, LLC

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STEP 1: Be Informed

The key to minimizing hurricane & tropical storm-related damage is having an organized Catastrophe Action Plan.

The hurricane and tropical storm season in the United States and surrounding seas, begins June 1ST and runs through November 30TH, with the most destructive storms occurring in August and September. During this season, there is potential for significant wind, water and flood damage. The key to minimizing hurricane and tropical storm-related damage is having an organized Catastrophe Action Plan. This plan should incorporate catastrophe action planning, pre-hurricane preparations, monitoring storm conditions and damage and post-hurricane actions.

This guide will help minimize damage and provide suggestions to assist you in developing a plan if you don't already have one. If you already have a plan, this guide will suggest additional items that may not be included. The key is to develop and maintain an action plan for conditions and/or procedures specific to your facilities. It is important to remain informed and understand the terminology. By international agreement, all cyclone circulation originating over tropical waters are referred to as "tropical cyclones" and classified by form and intensity as follows:

Terms to Know

Tropical Disturbance :: A moving area of thunderstorms in the tropics that maintains its identity for 24 hours or more.

Tropical Depression :: Rotary circulation at surface, highest constant wind speed 38 miles per hour (33 knots).

Tropical Storm :: Distinct rotary circulation, constant wind speed ranges from 39 – 73 miles per hour (34 – 63 knots).

Hurricane :: A tropical cyclone with winds of 74 miles per hour or greater that is usually accompanied by heavy rain, thunder, lighting, coastal tidal surges and possible tornadoes. These storms are also known as typhoons in the Western Pacific and cyclones in the Indian Ocean and South Pacific Ocean around Australia.

Hurricane Watch :: Issued for a coastal area where there is a threat of hurricane conditions within 24 – 36 hours.

Hurricane Warning :: Issued when hurricane conditions are expected in a specified coastal area in 24 hours or less. Actions for protection of life and property should begin immediately.

Flash Flood Watch :: A flash flood is possible in the area; stay alert.

Flash Flood Warning :: A flash flood is imminent; take immediate action.

Hurricane Categories

The Saffir-Simpson Hurricane Scale is a measurement scale ranging from 1 to 5 of hurricane wind and ocean surge intensity. Category 1 is a weak hurricane where as Category 5 is the most intense.

What to Expect

Category 1 Hurricane

Light damage primarily to tree foliage and shrubbery. Moderate damage to unanchored mobile structures and poorly constructed signs. Minimal damage to other structures. Low-lying coastal roads flooded.

Category 2 Hurricane

Considerable damage to shrubbery and tree foliage. Extensive damage to exposed mobile structures and poorly constructed signs. Some damage to roofing materials of buildings. Coastal and low-lying inland roads flooded two to four hours prior to arrival of storm center. Evacuation of shoreline residences and coastal islands.

Category 3 Hurricane

Significant damage to shrubbery and trees, many large trees blown down. Many downed trees result in impaired overhead electrical and telephone lines. Mobile and smaller structures and poorly constructed signs near coast will be destroyed. Other buildings may sustain some roof, window and door damage. Larger structures near coast will be damaged by flooding, waves and floating debris. Substantial flooding in coastal areas and low-lying inland roads will flood three to five hours before storm center arrives. Flat terrain 5 ft. (1.5 m) or less above sea level will be flooded inland 8 miles (13 km) or more. Evacuate low-lying residences within several blocks of shoreline.

Category 4 Hurricane

Shrubs, trees and most signs blown down with accompanying power and telephone impairments. Mobile and small structures will be destroyed. Roof failure on many smaller residences. Extensive damage to substandard roofs, windows, and doors. Flooding of flat terrain 10 ft. (3 m) or less above sea level as far inland as 6 miles (9.6 km). Considerable damage to lower floors of structures near shore due to flooding, waves and floating debris. Low-lying inland roads flooded three to five hours before storm center arrives. Significant erosion of beaches. Evacuation of all residences within 500 yards of shoreline and of single-story residences on low ground within 2 miles (3.2 km) of shore.

Category 5 Hurricane

Shrubs, trees and most signs blown down. Mobile and smaller structures destroyed. Roof failure on many residences and poorly designed industrial buildings. Extensive damage to roofs, windows, and doors, as well as electrical distribution and transmission towers and overhead telephone lines. Flooding of flat terrain 10 ft. (3 m) or less above sea level as far inland as 6 miles (9.6 km). Considerable damage to lower floors of structures less than 15 ft. (4.6 m) above sea level and within several blocks of shore due to flooding, waves and floating debris. Low-lying inland roads flooded three to five hours before storm center arrives. Significant erosion of beaches. Evacuation of residential areas located in low-lying terrain within 5 to 10 miles (8 to 16 km) of shore.



STEP 2: Be Prepared

Catastrophe Action Plan

Planning often prevents an emergency from becoming a catastrophe. The Catastrophe Action Plan should provide answers to basic questions of who, what, where and when. It should identify specific personnel, property and capital necessary to get back into operation. Planning will help you set priorities and allocate your resources. Include enough detailed information for the plan to be effectively executed.

- Develop a comprehensive emergency action plan and update regularly. The plan should be flexible to effectively adapt to changing conditions.
- Organize and train an emergency action team. The emergency action team leader must have the authority to implement the action plan. This would include shutting down operations and sending employees home. Notify local authorities when personnel are staying on site (team members should only remain on site when safe to do so).
- Staff and train the members of the action plan and provide regular drills. Employees trained in emergency measures are more likely to function effectively and without panic.
- Develop checklists for action items (activities) to be done at predetermined times. In this packet we've included:

A Pre-Hurricane Checklist :: A compilation of action items to be done in preparation for hurricane and tropical storm season. It also identifies persons assigned to specific responsibilities.

An Impending Hurricane Checklist :: A list of activities (action items) that should be done in preparation for an impending hurricane. It also identifies the person responsible for each activity, the time needed to complete that activity, who completed the activity and when.

During Hurricane Checklist :: This list provides an outline of actions to be taken during the storm, if safe to do so.

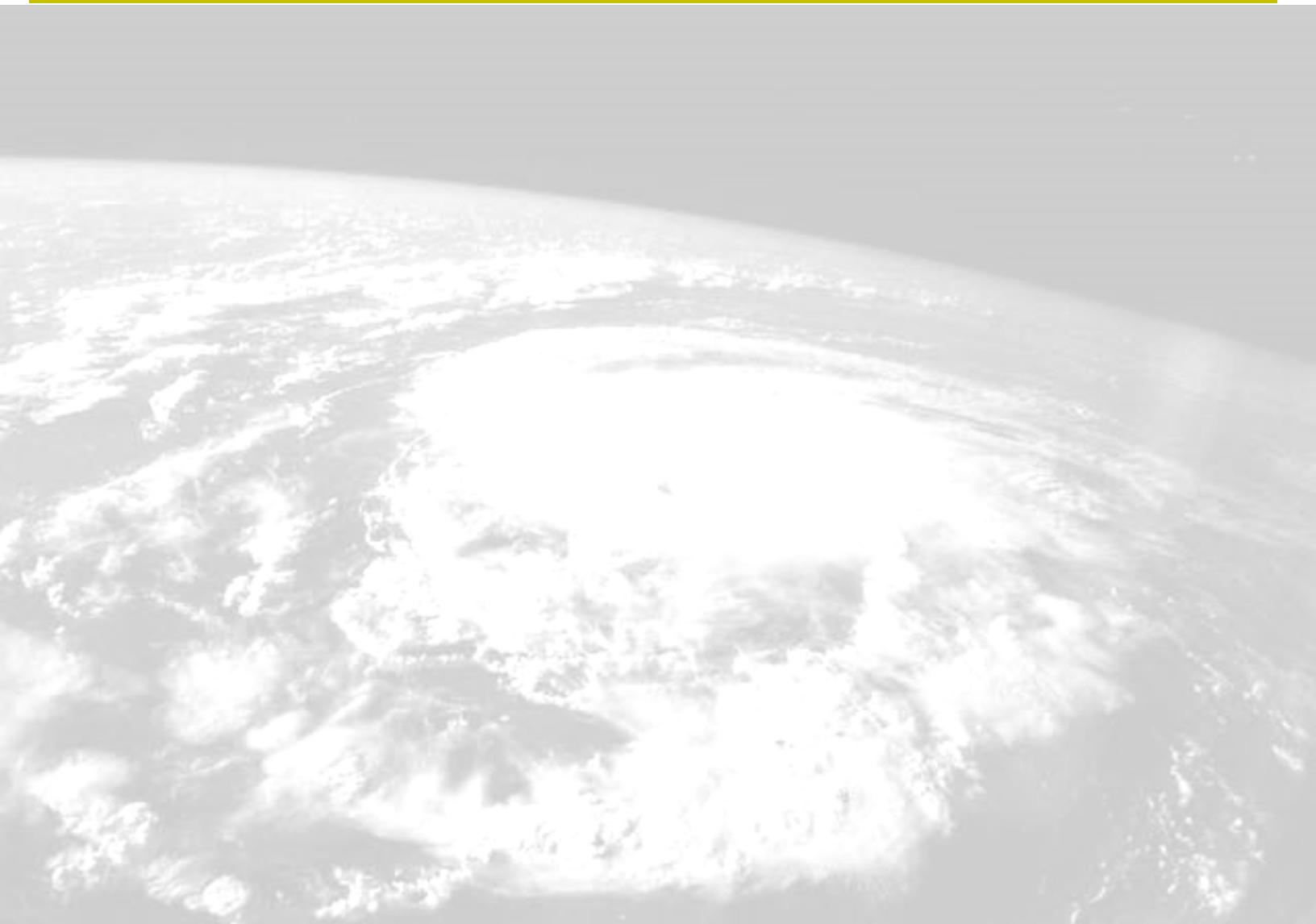
After Hurricane Checklist :: This list ways to asses damage done after a hurricane and identifies potential areas of concern that may require action by emergency response personnel to minimize the damage.

STEP 3: Follow Through

Once a hurricane or tropical storm threatens the area, immediately implement the Catastrophe Action Plan. Be willing to modify the plan to address the specific circumstances of the emergency as needed.

The Saffir-Simpson Classification System for Hurricanes

CATEGORY	WIND SPEED	PRESSURES	STORM SURGE	DAMAGE
Tropical Depression	0—38 mph (0—62 km/hr)	-	0 ft. (0 m)	Non to Minimal
Tropical Storm	39—73 mph (63—119 km/hr)	-	0—3 ft. (0—0.9 m)	Minimal
1	74—95 mph (120—153 km/hr)	> 28.93 in (> 980 mb)	4—5 ft. (1.0—1.5 m)	Light
2	96—110 mph (154—177 km/hr)	28.5—28.92 in (965—979 mb)	6—8 ft. (1.6—2.4 m)	Moderate
3	111—130 mph (179—209 km/hr)	27.91—28.49 in (945—964 mb)	9—12 ft. (2.5—3.6 m)	Extensive
4	131—155 mph (211—249 km/hr)	27.17—27.9 in (920—944 mb)	13—18 ft. (3.7—5.5 m)	Extreme
5	> 155 mph (> 249 km.hr)	< 27.17 in (< 920 mb)	> 18 ft. (> 5.5 m)	Catastrophic



Facility Name / Location

Date

Personnel Responsible	Action Item	Completed By / Date
	<ul style="list-style-type: none"> Maintain a current list of telephone numbers and contacts for emergency action team members, emergency management (civil defense), local police and fire departments, medical facilities, utilities, contractors, vendors. 	/
	<ul style="list-style-type: none"> Contact local authorities to plan and coordinate activities before the need for emergency action. That way both of you will be better prepared. 	/
	<ul style="list-style-type: none"> Designate a person to monitor weather conditions and keep the action plan leader up to date on weather conditions before, during and after a hurricane. 	/
	<ul style="list-style-type: none"> Arrange backup communications such as two war radios or cellular phones. 	/
	<ul style="list-style-type: none"> Arrange an off-site emergency communications control center such as a hotel meeting room just outside the hurricane area in case it becomes too dangerous to remain on site. 	/
	<ul style="list-style-type: none"> Provide diesel or gasoline-driven emergency generator on site with full tank and reserve fuel on hand (High demand may make it difficult to obtain a generator. Advance arrangements and/or retainers may assure availability. 	/
	<ul style="list-style-type: none"> Determine which company records are vital and make plans to protect/relocate them. 	/
	<ul style="list-style-type: none"> Identify vulnerable and/or critical equipment and processes. Provide instructions for safely shutting down processes, data processing equipment , etc. Consider disconnection and relocating critical equipment to higher elevations. 	/
	<ul style="list-style-type: none"> Identify key equipment and stock that will need to be protected with tarpaulins or waterproof cover. 	/
	<ul style="list-style-type: none"> Identify a hot site (an off-site data processing location for immediate business resumption) or a cold site (an off-site location ready for set-up of your own data processing equipment). Also, consider an off-site business recovery facility where you can resume general business operations. 	/
	<ul style="list-style-type: none"> Identify actions to take in the even of live electrical wires, leaking gas, flammable liquids, corrosive/toxic material and damage to foundations or under-ground piping. 	/
	<ul style="list-style-type: none"> Evaluate the interdependency of your facility and develop a contingency plan. 	/
	<ul style="list-style-type: none"> Maintain ongoing agreements with RAJ & Associates for supplies and local contractors for any repairs needed after a hurricane. When possible, use contractors who are outside potential hurricane areas. Local contractors may also have storm damage or local authorities' needs may be given higher priority. 	/
	<ul style="list-style-type: none"> Maintain emergency supplies throughout hurricane season. (Drinkable water, nonperishable food, medical supplies, flashlights, batteries, walkie-talkies, portable pumps, hose, emergency lighting, lumber, nails, hand & power tools, plastic covers and tarpaulins, etc.) 	

Facility Name / Location

Date

Personnel Responsible	Action Item	Completed By / Date
	<ul style="list-style-type: none"> Maintain straps or other means on hand to brace/anchor yard storage, signs, cranes and roof mounted equipment. 	/
	<ul style="list-style-type: none"> Inspect and repair roof flashing, coverings, drains, gutters and edge strips. Remove debris and unrestrained materials from roofs. 	/
	<ul style="list-style-type: none"> Inspect and maintain signs, stacks, and tower supports, guy wires and anchor points. 	/
	<ul style="list-style-type: none"> Repair or replace loose or worn door and window latches, hardware and seals. 	/
	<ul style="list-style-type: none"> Provide pre-fitted hurricane shutters and/or plywood for windows and doorways where practical. If possible, install them in advance and leave them in a place for the hurricane season. 	/
	<ul style="list-style-type: none"> Prepare for hurricane-related flooding with sandbags and an ample supply of rooms, mops, squeegees and absorbents to help remove water. 	/
	<ul style="list-style-type: none"> Trim or remove any large trees that could fall and damage building, impair fire protection or electrical power and communication lines, etc... 	/
	<ul style="list-style-type: none"> Arrange for site security after hurricane. 	/
	<ul style="list-style-type: none"> Prepare space for inside storage of dumpsters, yard equipment and yard stock. 	/
	<ul style="list-style-type: none"> Evaluate approaches to your facility for bridges or other low lying areas for emergency access and employee safe routes to return to work. 	/
	<ul style="list-style-type: none"> Advise employees how they will be notified when to return to work. (Local radio or TV station public service announcements, telephone call, etc... 	/
	<ul style="list-style-type: none"> Establish priority/back-up personnel or rotation personnel for critical operations and/or process. Employees may also have personal emergencies and may or may not be available to return to work promptly. 	/
		/
		/
		/

Impending Hurricane or Severe Windstorm

1. Map the windstorm front and stay up-to-date on the storm's progress.
2. Backup all data on servers and personal computers. If the backup site is within the area that may be affected by the storm, take backup tapes with you in the evacuation.
3. Shut down operations that depend on outside power sources in an orderly manner, following established procedures.
4. Turn off all non-critical devices such as server monitors and workstations and other non-essential electrical equipment.
5. Check the integrity of the Uninterruptible Power Supply (UPS). Move the UPS to the highest level possible above the floor.
6. Inspect and make emergency repairs to drains, gutters and flashing.
7. Strap or anchor to the roof deck support assembly (e.g., the joists) all roof-mounted equipment such as HVAC units and exhaust vents.
8. Check/maintain all necessary backup equipment, such as emergency generators and communication devices.
9. Protect/relocate vital records.
10. Install windstorm shutters/plywood over windows and doors.
11. Take the following steps so that items outdoors will not blow away or cause damage:
 - Remove all loose debris
 - Anchor or relocate all nonessential equipment to a safe indoor location.
 - Secure storage of flammable liquid drums, or move them to a sheltered area (but never into main facility areas)
 - Anchor all portable buildings e.g., trailers etc to the ground.
 - Secure large cranes and other heavy equipment.
 - Make sure outdoor signs are properly braced.
12. Inspect all fire protection equipment, such as sprinkler control valves and fire pumps.
13. Ensure that the employees who volunteered to stay on site have proper supplies and equipment (drinkable water, nonperishable food, medical, flashlights, walkie-talkies).
14. Have cash on hand for post-windstorm needs, such as buying food and supplies, or paying employees and contractors.
15. Repair and fill above-ground tanks with water.
16. Fill fuel tanks of generators, fire pumps, and all company-owned vehicles.
17. Clean out drains and catch basins.
18. Protect computers, machinery, and stock with tarpaulins and waterproof covers.
19. Remove as many goods as possible from the floor, or ship them out of the facility.
20. Isolate, neutralize, or remove from the site any chemicals that can react violently with each other.
21. Shut off gas to minimize fire loss.
22. Protect or shut off other possible flame sources.

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During the Storm

*** Emergency response personnel should stay at the facility *only* if safe to do so.**

1. Patrol the property continuously and watch for roof leaks, pipe breakage, fire or structural damage. During the height of a windstorm, personnel should remain in a place that has been identified as safe from wind and flood.
2. Constantly monitor any equipment that must remain on line.
3. During power failure, turn off electrical switches to prevent reactivation before necessary checks are completed.

After the Storm

1. Secure the site.
2. Survey for damage.
3. Survey for safety hazards such as live wires, leaking gas or flammable liquids, poisonous gases, and damage to foundations or underground piping.
4. Repair damage to the automatic sprinkler system and get it back in service as soon as possible.
5. Call in key personnel and notify contractors to start repairs. Make sure safety systems are fully implemented before work is allowed to begin. This means controlling smoking and other open flame sources. Require contractors to share responsibility for establishing fire-safe conditions before and during the job.
6. Begin salvage as soon as possible to prevent further damage:
cover broken windows and torn roof coverings immediately
separate damaged goods, but beware of accumulating too much combustible debris inside a building
7. Clean roof drains and remove debris from roof to prevent drainage problems.
8. Visually check any open bus bars, conductors and exposed insulators before restarting main electrical distribution systems.

** RAJ & Associates, LLC provides this information as advisory only. Please review all local regulations and requirements prior to following any information contained herein. RAJ & Associates, LLC has not tried to identify all hazards or possible scenarios. RAJ & Associates, LLC does not warrant that requirements of any federal, state or local law; regulations or ordinance have or have not been met.*

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