

A circular blue sign with a white hurricane icon at the top and the text 'HURRICANE EVACUATION ROUTE' in white capital letters.

HURRICANE
EVACUATION
ROUTE

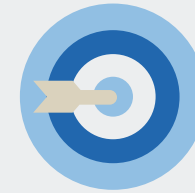
Windstorms Emergency Plan

Actionable advice

An Emergency Response Plan (ERP) is an important tool to help reduce the impact of damage of a natural hazard to your property, business and employees.

This Windstorm Emergency Response Plan details some actions to consider before, during, and after a windstorm event to help reduce damage, restore operations and protect lives.

It has been classified into five phases:



Strategy Phase



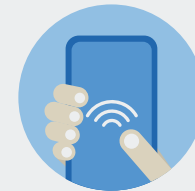
Preparation Phase #1

(48 hours before the windstorm)



Preparation Phase #2

(36 hours before the windstorm)



Response Phase

(12 hours before windstorm;
continuing during event)



Recovery Phase

(after the windstorm)



Your Windstorms Emergency Plan

must be reviewed at least annually and revised with increasing information, e.g. after recent events in the region or lessons learned at other locations.

The effectiveness and reliability of any protection measure, whether physical or organizational (including your Emergency Response Plan) is dependent on understanding the regional characteristics of the event, assessing the quality of the structures, building envelopes, and non-structural elements (anchorage of roof-mounted equipment, roofing system, roof drainage system components, etc.). Any deficiencies identified by the qualified service personnel performing the assessment are to be rectified as early as possible.





Strategy Phase

Careful planning and preparation are important factors in ensuring the effectiveness and reliability of a Windstorm Emergency Response Plan, which should be part of a comprehensive risk assessment analysis.

We recommend starting the following activities several months before a potential event.

Action	Detail
<p>Understand the regional hazard characteristics</p>	<ul style="list-style-type: none"> • Analyze historical events, local regulations and guidelines, structural design codes, local meteorological agencies, universities, research institutes, etc. • Analyze the characteristics of windstorms typical of your region needs, e.g. <ul style="list-style-type: none"> – Typical duration of windstorm event. – Rainfall intensities – duration and intensity/depth of rainfall. – Secondary events, e.g. landslides, flooding (surface runoff). – Performance of infrastructure (power, roads, public drainage systems). – Performance of public emergency response services.
<p>Verify structures conform to local codes, standards and best practice (as a minimum)</p>	<ul style="list-style-type: none"> • Local design codes define the minimum requirements for the force-resisting elements of the buildings (beams, columns, etc.) and non-structural elements (windows, façade and roof elements, etc.) to resist wind pressures prevalent in the region. • In many cases, non-structural elements, e.g. anchorage of roof-mounted equipment, glazing (windows and skylights), doors, roof drainage components, roofing systems, and so on, are often not designed for prevailing wind conditions. • Design, detailing, installation and maintenance of the components mentioned above must conform to the most recent version of the national structural design code and/or (where codes or standards are not available) international best practice validated by practical experience, and industry or academic institutions, with the guidance of a qualified structural engineer. • Contractors must provide written confirmation that the components have been detailed, designed and installed according to local wind conditions and national structural design/loading codes.
<p>Provide a wind safe room</p>	<p>The safe room should be:</p> <ul style="list-style-type: none"> • Large enough to accommodate at least two work shifts (assume worst-case scenario of event impacting at shift change). • Designed, detailed and constructed according to standards specific to safe rooms or international best practice. • Contain enough non-perishable provisions (water, canned goods, etc.) for the duration of the windstorm.

- If the site is within a storm surge or a flood zone.
- Safe evacuation routes for employees.
- Develop potential damage scenarios based on the above information and plan resources, communications, materials, etc. accordingly.

- For already-installed critical components (whose failure can result in extensive damage to the building) a dedicated assessment is to be performed by a qualified specialist.



Strategy Phase

Action

Detail

Determine the lead time available to implement various stages of the plan

- Identify and contact the local (meteorological) authority or agency responsible for monitoring meteorological conditions (forecasting, monitoring and warning service). These responsibilities may be divided between various agencies.
- Establish the conditions at which warnings are issued by the relevant authorities and the time until adverse conditions reach the site.
- Evaluate the available response times for each warning level, i.e. duration between the different warning levels issued by the responsible authority and arrival of the windstorm.
- Define actions for each warning level and the team members responsible for implementing these actions, as well as resources required.
- Select emergency response team, develop capabilities, establish network with local authorities (emergency response, monitoring and warning, etc.).
- Identify critical areas of the site, i.e. operations-critical equipment, stock and equipment with long lead time for replacement, underground fuel supply tanks and septic tanks (release can cause contamination), etc. Such areas are to be given priority and possibly special protection measures implemented.

Verify operational reliability of essential services

- All essential services must remain operational during and after the event, e.g. fire protection systems (water supplies, fire pumps, sprinklers, fire alarms and special extinguishing systems), fuel supply for emergency generators, food and potable water, sanitary facilities, temporary sleeping arrangements, and so on.
- Supplies should be adequate for a worst-case scenario of an event occurring at shift change, i.e. total number of employees to be accounted for/accommodated is two shifts.
- Identify vital business records (e.g. technical drawings, electronic files, paper files). Make plans to protect them or relocate them to a protected location.

Conduct regular training and review of the Emergency Response Plan

- Review the windstorm emergency action plan with all involved personnel. The Emergency Response Team 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.
- A roster of employees present at each shift should be available and accessible by the Emergency Response Team at all times.
- Designate a wind-safe room as a coordination room (Emergency Command Room) with capabilities such as power and communication.

Prepare emergency equipment

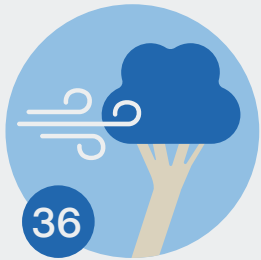
- Prepare an Emergency Response Team supply kit that includes items necessary during and immediately after the storm. Example contents include: satellite phones, two-way radios, portable AM/FM radios, flashlights, lanterns, batteries, rubber boots, gloves, blankets or sleeping bags, first-aid kit, spare clothing, alternative power sources (solar or hand-wind rechargers). Consider if communications can be maintained between the Emergency Response Team even when utilities and infrastructure (power, mobile services, etc.) are not available.
- Identify and, if possible, establish priority service contracts with critical contractors to avoid competition for resources and specialist resources during the recovery phase (after the event).



Preparation Phase #1

48 hours before the windstorm

Action	Detail		
Implement flood-relevant protection measures	<p>If your facility is in a flood or storm surge, develop specific response procedures as part of the emergency response plan. Considering the intense rainfall that is associated with windstorm events, implement measures to reduce the likelihood of water getting inside buildings, e.g.:</p> <ul style="list-style-type: none"> • Check building roofing systems, e.g. loose or improper overlaps. 	<ul style="list-style-type: none"> • Make repairs to coverings and flashing as time allows. • Verify roof drains are clear of leaves, debris and other obstructions. • Verify outside storm drains and catch basins are clear of debris. • Remove any accumulated rain water from storage tank spill containment areas. 	<ul style="list-style-type: none"> • Check serviceability of emergency equipment and supplies. • Confirm that yard equipment is not directly placed on the ground and adequate clearance, say 30 cm (1 ft), under the equipment is provided. • Inspect outside site boundaries, e.g. construction sites, loose debris, and so on, which could pose a threat to your site and buildings.
Check serviceability of emergency equipment and supplies	<ul style="list-style-type: none"> • Verify dewatering pumps are in service and working. • Fill fuel tanks for emergency generators, diesel fire pumps, water heaters and other vital services. 	<ul style="list-style-type: none"> • Confirm non-perishable food and potable water is in good condition. 	
Implement wind-relevant protection measures	<ul style="list-style-type: none"> • Remove loose items from the roof, secure equipment doors and covers, and remove debris from outdoor areas that may become 'missiles'. • Remove or secure loose outdoor equipment. 	<ul style="list-style-type: none"> • Inspect outside site boundaries, e.g. construction sites, loose debris, and so on, which could pose a threat to your site and buildings. 	<ul style="list-style-type: none"> • For new construction projects: <ul style="list-style-type: none"> – Remove loose equipment. – Secure and protect material storage. – Temporarily brace new construction. – Secure roofing and items on the roof.
Initiate safe shut-down procedures for important equipment	<ul style="list-style-type: none"> • Notify suppliers of impending shut-down, as well as alternative production facilities. • Inform your central organization (Group BCP unit and/or Group Risk Manager) of activation of BCP. 	<ul style="list-style-type: none"> • Maintain contact with suppliers of pipeline delivered materials. Those suppliers may also be making shutdown preparations. • Ship out as much stock as possible. Ensure remaining stock is elevated at least 30 cm (1 ft) above floor level or store it in a protected area. 	<ul style="list-style-type: none"> • Back up computer data to a location that will not be affected by the storm.



Preparation Phase #2

36 hours before the
windstorm

Action	Detail		
Infrastructure and building inspection	<ul style="list-style-type: none"> Raise critical equipment above the expected flood level, if known, or at least 30 cm (1 ft.) above floor level, and move critical equipment from basement and other below-ground areas to secure upper levels of the building. 	<ul style="list-style-type: none"> Install manual protection systems (e.g. shutters, plywood covers and flood gates). Set up flood barriers (if necessary) at all first (ground) floor doors and entrances, especially of 	<ul style="list-style-type: none"> operations-critical structures. Seal all openings in the building envelope at ground level. Seal buildings under construction to avoid entry of wind-driven rain.
Commence shut-down of operations	<ul style="list-style-type: none"> Stop incoming shipments of raw materials that will be exposed to damage. Initiate an safe shutdown of production equipment and systems that rely upon utility power. 	<ul style="list-style-type: none"> For manufacturing facilities, shut own processes that will be exposed to damage. Switch off non-essential electrical systems. 	<ul style="list-style-type: none"> Turn off fuel and gas services. Evacuate non-critical personnel after ensuring roads are safe for travel.
Secure potential wind-borne debris	<ul style="list-style-type: none"> Remove and secure small equipment, e.g. cable tray covers, roof-mounted ventilation hoods, etc. Remove or secure scaffolding. 	<ul style="list-style-type: none"> Secure outdoor storage or equipment that cannot be moved, anchor portable buildings or trailers to the ground and cover critical stock and equipment with well-secured waterproof tarpaulins. 	



Response Phase

12 hours before windstorm,
continuing during event

Action

Implement Emergency Response Team

Detail

- Emergency Response Team to evacuate to pre-defined secure areas of site (e.g. windstorm shelter or emergency command center) for the duration of the event.

- Continuously monitor new bulletins (radio, television, internet, etc.) and local warning service, e.g. meteorological agency.



Recovery Phase

After the windstorm

Action	Detail
Infrastructure and building inspection	<ul style="list-style-type: none"> • Anticipate loss of infrastructure (electrical power, drinking water, etc.) for several days following the storm. • If impacted by storm surge, paved or hardscape surfaces may be undermined by wave action and subject to collapse. Beware of sinkholes and damage to foundations. A detailed inspection by a qualified specialist is to be performed if any surface evidence of foundation damage is observed. • Do not switch on electrical power until all areas of potential hazardous leakage have been investigated and corrective measures taken. All inspections and repairs are to be conducted by a qualified specialist. This includes photovoltaic or wind turbine power. • Verify the status of protection systems. Check water supplies, fire pumps, automatic sprinklers, fire alarms and security systems. • Have qualified personnel thoroughly check all utility systems including, but not limited to, photovoltaic systems, roof-mounted equipment, and hazardous processes before returning them to service.
Preparations for return of employees	<ul style="list-style-type: none"> • Survey the site for hazards: live electrical wires, broken glass and sharp metal, leaking fuel gases or flammable liquids, damaged building features or contents that could shift or collapse. • When returning to the site, bring identification, additional supplies and cameras to document conditions. • Contact local authorities to ensure roads are clear and there are no threats of landslides, local surface runoff etc.
Execute emergency repairs	<ul style="list-style-type: none"> • Survey the damage and initiate repairs immediately: Promptly notify contractors to avoid waiting in line for service. Establish repair priorities, including the building envelope, utilities and fire protection systems. • Determine what supplies are needed. • Reinforce appropriate management loss prevention programs including: Controlling the use of smoking materials, using hot work permits to manage all cutting or welding operations. • Manage impairment for protection systems: Expedite repairs, Post fire watch in area with impaired fire protection, Post security personnel in areas where building or site access is not suitably controlled. • Begin salvage as soon as possible to prevent further damage, protect the building and contents from further damage, separate damaged goods, save all damaged goods, avoid accumulations of combustible materials inside the building, avoid storage in areas with impaired fire protection or which have been contaminated (leaked sewage, fuel, etc.). • Determine whether adequate raw materials will be available when the plant is physically ready to begin operations. Remember that local suppliers and distributors may still be down or at reduced operations. • Clear roof drains, balcony drains and ground-level catch basins and drains in preparation for future rain events. Do not access the roof if damage has been identified or if roof has not been inspected for damage. • Initiate a detailed inspection of the building envelope by qualified personnel.
Administrative/claims reporting	<ul style="list-style-type: none"> • Maintain contact with corporate management and your insurance broker. • Contact your insurer to report claims and fire protection impairments.

This publication has been prepared by Zurich Insurance Group Ltd and the opinions expressed therein are those of Zurich Insurance Group Ltd as of the date of writing and are subject to change without notice. This publication has been produced solely for informational purposes. All information contained in this publication have been compiled and obtained from sources believed to be reliable and credible but no representation or warranty, express or implied, is made by Zurich Insurance Group Ltd or any of its subsidiaries (the 'Group') as to their accuracy or completeness.

This publication is not intended to be legal, underwriting, financial, investment or any other type of professional advice. The Group disclaims any and all liability whatsoever resulting from the use of or reliance upon this publication. Certain statements in this publication are forward-looking statements, including, but not limited to, statements that are predictions of or indicate future events, trends, plans, developments or objectives. Undue reliance should not be placed on such statements because, by their nature, they are subject to known and unknown risks and uncertainties and can be affected by numerous unforeseeable factors.

The subject matter of this publication is also not tied to any specific insurance product nor will it ensure coverage under any insurance policy. This publication may not be distributed or reproduced either in whole, or in part, without prior written permission of Zurich Insurance Group Ltd, Mythenquai 2, 8002 Zurich, Switzerland. Neither Zurich Insurance Group Ltd nor any of its subsidiaries accept liability for any loss arising from the use or distribution of this publication. This publication does not constitute an offer or an invitation

