TECHNICAL INFORMATION PAPER SERIES: FLOOD INSURANCE

PREPARING FOR HURRICANES: SAFETY TIPS FOR BUSINESS OWNERS

WHAT IS A HURRICANE?

A **hurricane** is a **tropical storm** that has rotating winds of at least 73 mph, but rarely exceeding 150 mph. Hurricanes are usually accompanied by rain, thunder and lightning. These severe storms, which are spawned by low-pressure depressions moving over warm, tropical waters, originate in the Atlantic Ocean from June to October. In an average year, approximately six Atlantic tropical storms mature into hurricanes. (Hurricanes that originate in the Pacific Ocean are referred to as **typhoons**.)

As the warming air rises and gains moisture, it begins to spin and gain speed near the calm center, known as the eye of the hurricane. Surrounding the eye is a towering wall of moisture laden clouds whirled by strong winds.

At the center of the hurricane, the low pressure allows the surface of the ocean to be drawn up into the eye, forming a mound of water one to three feet higher than the surrounding surface. Driven by winds, this mound of water becomes the **storm surge**; as the storm makes landfall, the **storm surge** can tower up to twenty feet higher than the normal high tide.

WHAT HAPPENS WHEN A HURRICANE MAKES LANDFALL?

Once a hurricane hits land, it loses contact with its primary source of energy, the warm ocean waters, and begins to slow down. As the hurricane passes over land, increased friction contributes to the break-up of the storm.

The greatest threat posed from a hurricane is from the heavy rainfall and from flooding caused by the storm surge. However, hurricane-force winds and flying debris can cause extensive damage until they dissipate. Hurricanes can also spawn **tornadoes** that are extremely dangerous and that contribute to the overall damage.

Hurricanes can cause catastrophic damage and potentially large losses of life. In recent years, the death toll from hurricanes has been greatly diminished by timely warnings of approaching storms and by improved programs of public awareness. At the same time, losses from hurricane-related property damage in the United States continue to climb; this is primarily due to an increase in population and construction.

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HURRICANE FORECASTING

The National Oceanic and Atmospheric Administration's (NOAA) National Hurricane Center in Miami, Florida uses satellite imagery, radar and weather balloons to spot conditions that could trigger a hurricane.

As the storm nears land, NOAA and the Air Force use special aircraft to fly through the hurricane, measuring wind speed and barometric pressure and gathering other data. The information gathered is analyzed by computer models that estimate the storm's strength, rate of development, path, and estimated storm surge. Based on this information, NOAA issues a tropical storm warning, a hurricane watch, or a hurricane warning.

A **tropical storm warning** may be issued if winds of 39 to 73 mph are expected in an area. Such a warning will not be issued first if a hurricane is expected to strike.

A **hurricane watch** is issued for coastal areas when a tropical storm or hurricane conditions threaten within 24 to 36 hours.

A **hurricane warning** is issued for specific coastal areas when hurricane-force winds are expected to strike within 24 hours or less.

Usually, warnings allow sufficient time to prepare against hurricane damage and to make decisions for evacuation of personnel, if proper preparation had been taken at the beginning of the hurricane season. Use the checklists on the following pages to review essential steps in hurricane preparedness, response, and recovery.

BUSINESS CONTINUITY MANAGEMENT: BEFORE THE HURRICANE

At the beginning of the hurricane season:

- Establish a Business Continuity Management (BCM) Plan that takes prevention, emergency response and disaster recovery into consideration. If a BCM is already in place, review and update it as needed for hurricane readiness.
- Designate a BCM coordinator and a BCM team. As- sign responsibility to specific employees for advance arrangements to initiate the plan.
- Brace outside storage tanks and outer structures.
- Inspect all battery powered equipment and backup power.
- Inspect sewers and drains.
- Check all drainage pumps.
- Inspect the roof and flashing for serviceability.
- Check the landscaping; prune dead branches.
- Have a supply of plastic or tarpaulins on hand to cover water-sensitive equipment.

At the approach of the hurricane:

- Inspect roof drains and piping; are they clear of debris and fully functional?
- Check floor drains and sumps; are they clear of debris and fully functional?
- Check all storm water catch basins and grates to be sure they are clear of debris.
- Be sure that roof flashing is secure.
- Make sure that doors and windows will remain latched.
- Protect windows from flying debris.
- Walk the grounds; move objects inside that could become missiles in high winds.
- Anchor any equipment stored outside that could be moved by high winds.
- Move supplies stored outside to inside storage.
- Assemble supplies for the emergency crews and for emergency repairs.
- Protect vital records against flooding and wind.
- Secure backup records.
- Inspect fire protection equipment.
- Top off fuel in the emergency generators; test run.
- Evacuate non-essential personnel.
- Have remaining personnel take shelter.
- Check the supply and serviceability of sandbags.

BUSINESS CONTINUITY MANAGEMENT: DURING THE HURRICANE

- Patrol the facility continuously, as long as it is safe to do so.
- Check for any damage to the structure.
- Check for leaks and fire systems impairment.
- Complete any emergency repairs that are possible and safe to perform.
- Shut off any valves where pipes have been broken.
- Watch for flooding. Use sandbags when necessary.
- Watch for reverse winds after the eye of the storm has passed. They will affect different areas and perhaps break trees that had been blown in the other direction.

BUSINESS CONTINUITY MANAGEMENT: AFTER THE HURRICANE

- Conduct a roll call of all personnel on the premises.
- Assess the damage.
- Check for safety hazards (downed trees, branches, downed power wires, leaking gas, blocked roof drains, displaced reptiles).
- Make temporary repairs to protect the structure and supplies.
- Photograph and document any damage.
- Begin salvage operations.

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