AXA

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Natural disaster emergency planning and preparedness

An Environmental Risk Toolkit

Be prepared.

Disasters can happen at any time. Imagine that your business or facility is hit by a natural disaster, such as a hurricane, tornado, flood, earthquake or large wildfire. How will you ensure that your business quickly returns to normal operations and profitability? How will you protect your employees?

One way to help do this is to create a Natural Disaster Preparedness and Response Plan. Both the final plan and the planning process are useful tools to respond to emergencies and to minimize costs and business interruptions. It can also be a strategic tool in business planning to ensure operational continuity. Being prepared and having a written plan should also help companies more effectively respond to any third party liabilities and claims that may arise from the surrounding community in the aftermath of a disaster.

Why Plan for Natural Disasters?

But why should we plan since natural disasters are rare? One of the primary reasons is potential cost savings to the affected business. Preparedness saves time and money by allowing a faster and more efficient resumption of routine business activities. Preparedness and periodic planning help businesses return to normal operation after a man-made or natural disaster.

A disaster plan may also help enable a firm to stay in business and survive catastrophic events. According to the U.S. Federal Emergency Management Agency (FEMA), small businesses that don't have a plan in place generally don't survive after a disaster. It is estimated that depending on the disaster, roughly 40-60% never reopen and 90% fail within one year if they cannot resume operations within 5 days.

NATURAL DISASTER IMPACT

IMMEDIATE	ONE YEAR LATER	THREE YEARS LATER
40%	**25%**	**75%**
OF SMALL BUSINESSES WON'T REOPEN	MORE SMALL BUSINESSES WILL CLOSE	OF BUSINESSES WITHOUT A CONTINUITY PLAN WILL FAIL

Source: 2014 data from the Federal Emergency Management Agency (FEMA) and U.S. Dept of Labor

In addition to cost savings, there are other reasons to perform Emergency Planning:

- Regulatory requirements - U.S. Environmental Protection Agency (USEPA), Occupational Safety and Health Administration (OSHA), etc.
- Ability to recover and resume business – a strategic advantage
- Potential reduction in exposure to civil or criminal liability
- Improved public relations that enhance a company's image
- Moral responsibility to ensure a more positive outcome

Emergency Planning Process

Emergency or disaster preparedness is the process of ensuring that an organization has taken appropriate preventive measures and is in a state of readiness to minimize loss of life, injury, property damage and other effects of potential disastrous events. This includes preventing environmental impacts and minimizing pollution liability from hazardous materials and wastes at your site.

This process includes the creation of an emergency action plan. Emergency management and the emergency planning process incorporate a number of important steps to collectively address critical stages of disasters. A brief description of the planning continuum includes:

Emergency Preparedness - includes the controls and steps implemented before a disaster strikes, including the emergency planning process.

Emergency Response - includes those procedures and steps done immediately after an event and an interruption to business. This includes actions ranging from a simple fire evacuation plan to a detailed emergency plan. More detailed plans typically identify specific responsibilities, action items, and off-site resources and response contractors.

Disaster Recovery - includes the actions taken to restore critical functions so that some level of operations or services can be offered. It is not intended to get a firm completely running, but to re-start (or continue) business-critical activities. Disaster recovery planning may also be viewed as a subset of a larger process known as business continuity planning.

Business Continuity - includes the planning activities, managerial decisions, restoration activities and other actions necessary to get an organization back to where it was before a natural disaster/interruption.

The balance of this article concentrates on the Emergency Preparedness portion of the emergency and disaster planning process. Although it is recommended that one natural disaster plan be developed for all hazards, this risk bulletin concludes with a special focus on hurricane and wildfire risks and planning. Some scientists think exposures from these natural disasters may be increasing due to climate change.

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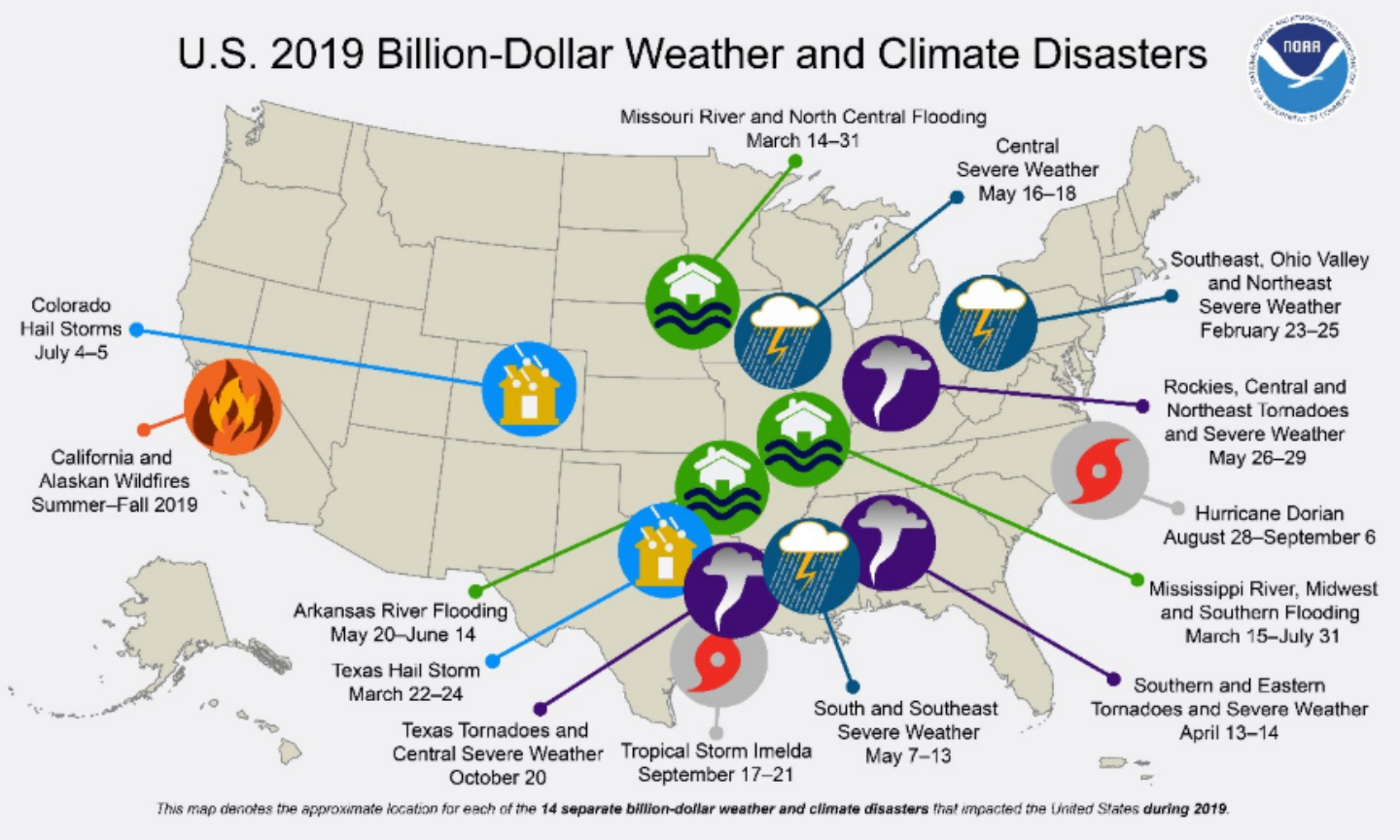


Image Source: https://coast.noaa.gov/data/nationalfacts/img/fast-fact-weather-climate-disasters.jpg

Disasters

In the United States alone, 2018 and 2019 each saw individual disaster events exceeding $14 billion. Total natural disaster losses were estimated at $91 billion in 2018 and $45 billion in 2019. In 2018, Hurricanes Michael and Florence, and the western U.S. wildfires, accounted for about $73 billion of the $91 billion total damages for the year. In 2019, historic flooding in the Midwest caused $10.8 billion of damages throughout millions of acres of land. This was one of the costliest inland U.S. flooding events on record.

Natural disaster property and environmental damages as well as the potential for loss of life are clearly good reasons for preparing a response plan. However, companies must also consider other risks such as supply chain disruption and business interruption that may result from a variety of natural disasters. If you fail to prepare, you have prepared to fail.

As part of the planning process, a firm needs to know what natural disasters and other emergencies may affect their business. The following is a list of natural events that should be considered in the emergency planning process:

- Fire (man and natural)
- Flood
- Hurricane/Tropical Storm
- Tornado/Wind Storm
- Winter Storm (ice, wind and blizzard)
- Earthquake/Tsunami
- Infectious Disease Pandemic

There may also be man-made events that occur during natural disasters that exacerbate emergency situations. These events should also be considered in the planning process and may include:

- Hazardous Materials Incident (on-site and off-site)
- Explosion or Severe Process Disruption
- Communications Failure
- Radiological Incident
- Civil Disturbance
- Terrorist Incident
- Large Scale Power/Utility Service Loss
- Human Errors

When preparing an emergency response plan, it is important to consider not just events at your facility, but in the surrounding area, including potential impacts to transportation routes and utilities. These off-site impacts can affect supply chains, communication networks, employee availability and your firm's ability to resume operations.

Remember that the planning process is just as important as the final plan. It is in the planning process where decisions are made, resources allocated, personnel assigned, training needs identified, etc. The final plan only documents the decisions made. The action taken to prepare and respond to an emergency is what is most important, not just the physical planning document. To put this in perspective, the effectiveness of the Emergency Plan will ultimately be evaluated in dollars saved, time saved while reestablishing operations, and other results, not the appearance or organization of the plan.

It is important to create one Natural Disaster Plan that addresses all risks, not separate plans for separate risks.

A disaster plan should also tie into existing plans and procedures so that planning and training time is reduced, and response personnel have familiarity with response procedures (i.e. don't re-invent the wheel if you don't have to). One integrated contingency plan that addresses various scenarios and regulatory requirements may be the solution for your company.

However, it is important to remember that you can't plan for everything. The goal is to create one flexible plan for all natural disaster risks. Simple is better – in an emergency you don't want to be reading paragraphs, but performing actions! Regular and effective training also allows employees to be more effective and less dependent upon a written plan in an emergency.

Performing the Planning Process

According to FEMA, the planning process to create an Emergency Plan involves the following steps:

- Decide to Plan
- Establish a Planning Team (with upper management support)
- Analyze Capabilities, Hazards and Vulnerabilities (Vulnerability Analysis)
- Develop the Plan
- Implement and Test the Plan (assess)
- Update (repeat)

When deciding to plan, it is important that company management reinforce the importance of the planning process and allocate sufficient time, resources and budgets to support it. Completion of the plan should be a goal of management and assigned personnel. The person placed in charge of the planning process should also be empowered to make decisions and allocate resources.

The planning team should incorporate a wide range of people and disciplines across the facility. It is important to get the skills and knowledge from all the entities and organizations in the company; otherwise, something critical may be overlooked in the planning process. Using a wide range of people also helps get buy-in and support for the plan.

The management team should also decide to appoint someone as an Emergency Coordinator to handle the management of emergency response activities. The Emergency Coordinator should be very familiar with the organization, site layout, and structures. The Emergency Coordinator need not be part of senior management, but should be empowered to make decisions during an emergency. The Emergency Coordinator should also be someone who is regularly at the facility. For multi-shift facilities, separate Emergency Coordinators may be named for each shift.

Developing a natural disaster plan is a detail oriented and cross-organizational process. Depending on the size and nature of the company, this may be a long process. Therefore, the most critical needs should be prioritized and addressed first.

It is also important to create one plan that addresses all risks, not separate plans for separate risks. The plan must be flexible enough to account for unanticipated occurrences. The plan should account for, as much as practically possible, disruptions in transportation, utility and communication services.

The plan should also consider actions to be taken should the facility become uninhabitable or severely damaged, or if critical utilities and services are missing for hours or days. Decision criteria for when to evacuate the facility (and return) should be part of the plan. Conversely, the plan should identify criteria for when it is better to "shelter in place" than to leave the facility.

Part of the planning process should include analyzing what emergency response capabilities and plans are already in place. This includes existing equipment and planning for fires, chemical spills, employee accidents and security breaches. This activity is known as a Capability Assessment and should include an analysis of existing employee skills, existing equipment (not just emergency equipment), local response resources, capabilities and facilities.

The facility is not alone in performing emergency planning. There are various sources of assistance available. Under the U.S. Emergency Planning and Community Right-to-Know Act, Local Emergency Planning Committees (LEPCs) were formed. These LEPCs are a good source of contacts with state and local government entities and other private businesses. These contacts can help with the emergency planning process and identify natural and other hazards that may be unknown to an individual facility.

Vulnerability Assessment

The planning process should include a site vulnerability analysis. This involves looking at all the natural, physical and man-made hazards surrounding the facility and estimating the probability of impact and the predicted impact.

This is one area where the LEPC, government agencies, and insurance carriers can be helpful in obtaining information. Important areas to examine are: flood plains, use of hazardous materials in surrounding businesses; and proximity to railroads, roads and airports. This process can be helpful in identifying appropriate off-site emergency response actions and associated communication channels.

As part of the planning process, the facility needs to identify critical products, services and operations. Especially important areas include:

- **Company Products and Services –** To which customers are the company's products and services most critical? Are supplier agreements in force?

- **Vendors and Suppliers –** What products and services are provided by outside parties, especially sole source vendors? Which supplies and raw materials are most important to the function of the company? Are stockpiles or alternative sources available? How long can operations continue without re-supply?

- **Lifeline Services and Utilities –** What utilities are most important to the function of the company and habitability of the premises? What backup sources/alternate supplies are available? For how long can the facility operate/remain habitable if utility services are unavailable?

- **Critical Operations and Equipment –** What operations and equipment must be protected? What processes or on-site hazardous material storage areas have the potential to create additional hazards if impacted by a natural disaster? What equipment must be available for use shortly after a disaster? How is this equipment protected? What preventative actions can be taken if/when a severe weather event is forecast (process shutdowns, tank level adjustments, etc.)?

The planning process should also involve identifying, copying and securely storing critical procedures and documents such as engineering documents, component lists, as-built drawings, product descriptions and facility information. This information should be stored in several places, including an off-site location, so that it may be retrieved in the event of a natural disaster. An on-going review of the generation of critical company information should be included in the planning process.

A variety of information may be important in responding to natural disasters. The following items at each facility should be determined, mapped and incorporated into planning documents, if applicable: call lists, checklist utility shutoffs, water hydrants, water main valves, water lines, gas main valves, gas lines, electrical cutoffs, electrical substations, storm drains, sewer lines, floor plans, alarm and sounders, fire extinguishers, fire suppression systems, exits, stairways, designated escape routes, restricted areas, hazardous materials (cleaning supplies and chemicals) and other high-value items.

Other items to consider in the planning process include teamwork/control/decision-making protocols (fall backs for when designated people are not present) and short term decision making (evacuate versus shelter in place).

Emergency Plan Implementation

Effective implementation of a disaster plan initially includes training of employees on the intent and basics of the plan. For the plan and natural disaster response to be effective, employees must be trained in what to do in the event of a disaster. All employees and long-term contractors should be familiar with the plan and participate in emergency drills. Remember that training levels will vary with the required actions of different site groups during an emergency.

Emergency drills and exercises should be performed in order to get the most out of the emergency planning process. Depending on the size and complexity of the facility, the training, drills and testing of emergency equipment should be done in coordination with the surrounding community. The facility and its staff may need to inform, coordinate and train with police, fire departments, emergency response contractors, regulators and other local businesses.

An Emergency Plan should not sit on a bookshelf gathering dust until used. Emergency management is a dynamic and on-going process. Planning is not the only part of emergency management, but it is one of the most important and ultimately most useful parts. The Emergency Plan is a living document and has to be used, updated and corrected for a business to perfect the plan and increase its value.

After each drill or incident, the emergency plan must be evaluated and the following questions answered:

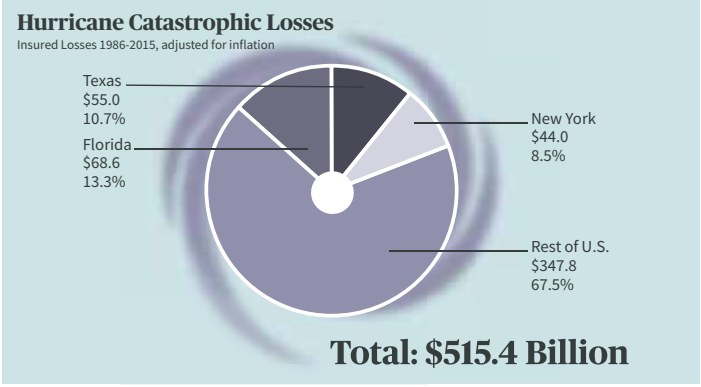
- What worked and what didn't work?
- What needs to be improved?
- Are responsibilities and necessary communications clear?
- What additional resources/tools are needed?
- Is there sufficient staff?
- Is training sufficient?
- What incidents and emergencies can be responded to

Any deficiencies noted should be corrected with changes made to the plan. These changes should be communicated to internal staff and outside resources as appropriate.

Updating the plan and training should be part of at least an annual process. It is also important not to forget the training of new employees as they are hired. On an on-going basis, it is important to update the plan, review training and equipment needs, and strive for continual improvement.

Hurricane Preparedness

Hurricanes are massive storm systems that form over ocean water and often move toward land. Hurricanes can generate multiple threats include high winds, heavy rainfall, storm surge, coastal and inland flooding, rip currents and tornadoes. The heavy winds of hurricanes can cause damage or destroy buildings and roads, as well as cause power, water and gas outages. These effects can cause injuries and fatalities and disrupt or block transportation. The impact from hurricanes can extend from the coast to several hundred miles inland causing billions in losses.



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The north Atlantic and Pacific hurricane and tropical storm season generally stretches from mid-May to the end of November. As per NOAA, hurricanes in the central and northern portions of these oceans have caused the most death and destruction. Each year, on average, 10 tropical storms (of which six become hurricanes) develop over the Atlantic Ocean, Caribbean Sea, or Gulf of Mexico. Many of these storms remain over the ocean. However, an average of five hurricanes strike the U.S. coastline every three years. Of these, two will be major hurricanes, which are storms of category 3 or higher on the Saffir-Simpson scale (i.e., winds ≥ 111 miles per hour).

Coastal and inland flooding risks are a primary consideration when evaluating hurricane risk factors. In order to find out more about your geographic location and its flood risk, visit FEMA's "Know Your Risk Map."

Having a robust preparedness plan for hurricanes and severe storm events involves several steps towards preparation and identification of foreseeable and unanticipated risks. A comprehensive plan includes the four phases of emergency planning: prevention, preparedness, response and recovery.

Preparing in-advance is essential in order to minimize the potential risk and to reap the maximum benefits from a well-structured and well thought out plan. Assessing capabilities and resources is also an important step.

Generally, a Hurricane Preparedness and Response Plan should address:
- Conditions that will activate the plan
- Chain of command
- Emergency functions, including site and equipment preparation, and who will perform them
- Specific evacuation procedures, including routes and exits
- Procedures for accounting for personnel, customers, visitors
- Equipment for personnel

When preparing any emergency preparedness and response plan the following key site risk factors should always be assessed:
- Systems, equipment, and structures
- People (staff/customers/suppliers/vendors)
- Overall operations – (shut down and start up impacts to raw materials, work in progress, products)

A Hurricane Preparedness and Response Program should address most of the following questions:
- Do you have a Business Continuity and Crisis Communications Plan?
- Have you included provision for employee training and information awareness sessions?
- Will a Hurricane Drill or other emergency drill be conducted?
- Is there a provision for an Employee Shelter/Evacuation Plan and preparation of emergency supplies?
- Are you familiar with State and local emergency response communication sources?
- Have all surrounding non-structural risks been mitigated/secured such as signposts, flagpoles, trees, fences, floodwalls/levees?
- Have all critical contents been elevated to at least one foot above the Base Flood Elevation (BFE) or the Design Flood Elevation (DFE)?
- Have provisions been made for safeguarding chemical containers, tanks, process equipment and piping?
- Have provisions been made (by consulting a professional engineer or licensed professional) for:
  - design of systems and connections to resist the expected wind loads and to protect vital systems through elevation, anchoring, or other approved means? (This would include all mechanical systems, fuel and storage tanks, electrical systems, other utilities.)
  - securing structural risks such as roof systems, wall systems, openings, gutters/downspouts, floodproofing, skylights, gable-end walls, soffits and others?
  - management of excess stormwater into sewers, ditches, water and wastewater treatment plants, impoundments and containment areas?

Each major sector of your business should have a documented checklist of functions and responsibilities which would cover communications, computer systems/information technology, operations/production, maintenance/security and shut down/start up. A good list of loss prevention suggestions are also provided in AXA XL's Severe Weather Planning Checklist.

An important element of an emergency preparedness plan is the recovery phase of the plan. Ensuring that recovery decisions can be made without delay will affect how long it takes to get the business up to normal operations, or even if the business survives. Salvage of property and assets and restoration of business operations/production areas are key issues that may require special attention.

Exposure to mold, asbestos and lead based paint and other hazardous building materials resulting from storm impacts are also considerations which may require caution and professional intervention. In addition to preparing relevant Operations and Maintenance Plans, seeking the assistance of public health authorities and trying to obtain help from specially trained contractors may be necessary.

Implementing timely mold prevention measures after a tropical storm or hurricane is imperative given excessive rainfall, high humidity and flooding potential. A thorough inspection of buildings for water intrusion and mold growth is essential particularly if HVAC system operation has been disrupted.

2018 Wildfires by the Numbers				
$12.35B	**22,454**	**95%**	**903,782**	**2,3,12**
Total losses associated with the six large-loss fires in 2018	Structures destroyed by the six large-loss wildfires	Percentage of all losses associated with large-loss fires that were attributed to the three largest wildfires	Acres burned by the six large-loss wildfires	Rank, respectively, of the three largest loss wildfires on the list of costliest wildfires in U.S. history

Wildfire Preparedness

According to the National Fire Protection Association (NFPA), each year wildfires burn across the U.S. there has been an increase in the population in high wildfire risk areas. It has been estimated that approximately 45 million homes abut or intermingle with wild lands and more than 72,000 U.S. communities are presently at risk.

In 2018 alone, more than 58,000 fires burned nearly nine million acres across the U.S. More than 25,000 structures were destroyed, including 18,137 residences and 229 commercial structures. California accounted for the highest number of structures lost in one state due to the number of significant wildfires, including the Mendocino Complex, Carr, Camp and Woolsey fires.

A robust Wildfire Preparedness Plan is essential to mitigate (to the best possible measure), any expected or unforeseen risks arising from wildfires. Life safety is paramount and often the best action to protect yourself and your personnel is to evacuate early to avoid being trapped. The National Weather Service issues a fire weather watch when potentially dangerous fire weather conditions are possible over the next 12 to 72 hours. If the danger is imminent, local authorities may issue an evacuation notice to alert residents that a fire is nearby and it is important to leave the area.

Several precautions can be taken to prevent widespread damage. These precautions include, but are not limited to, use of fire-resistant materials for construction/renovation, removal of leaves and vegetation on or near buildings, and demarcation of landscaping and ignition zones around your property. A best practice is to create a fire break and maintain a combustion zone buffer area around your facility. This includes the removal of vehicles and temporary storage areas.

While planning and preparing, it is essential to also practice and test some key response plan aspects such as your chain of communication, usage of fire extinguishers, fire prevention techniques, first aid skills and emergency response actions.

A Wildfire Preparedness Plan should include the following considerations:

- Inventory of all wildfire suppression equipment on-site
- Evacuation plans detailing emergency escape routes and safety zones
- List of key site contacts and corporate resources
- Identification of on-site personnel capable of wildfire suppression activities
- Training standards and requirements to be met by site fire brigade personnel
- Wildfire reporting procedures and chain of command
- List and location of all hazardous substances on-site
- On-site hot work and ignition source restrictions, particularly during high risk weather conditions
- Details of shut-down procedures
- Ignition source risk analysis of current operational activities and mitigation strategies for each
- List of radio frequencies, satellite phones, internet or other communication information
- Inventory and preparation of essential emergency supplies and information and the location on-site
- Maps of essential equipment, water sources, site layout, road systems, escape routes, power lines and pipelines

Post-incident, after returning to the site, it is also critical to ensure internal and external safety, lines of communication, health and sanitation and documentation/reporting of any damage. Health and safety considerations may require environmental sampling/assessment of fire areas involving hazardous materials or wastes.

Natural Disaster Planning Resources

This short risk bulletin provides some insight into the emergency planning process, but obviously it cannot provide all the information needed to prepare a comprehensive Natural Disaster Response Plan. An effective emergency plan must be customized to an individual organization and the multitude of hazards it may face. If your site is more susceptible to hurricane or wildfire risk for example, this portion of your planning process will need to be more robust.

Regardless of the type of facility or the natural disaster risks your site may face, there are several good sources of information to assist in the planning process.

One of the best available resources is the Federal Emergency Management Agency (http://www.fema.gov/). The FEMA website has a wealth of information, including sample plans and training. FEMA outlines 14 different types of natural disasters and provides prudent action steps to take before and during these emergencies. The FEMA site provides a good start for the planning process: www.ready.gov/ natural-disasters.

A detailed guide that is suitable for all but the smallest businesses, is FEMA Publication 141 "Emergency Management Guide for Business and Industry". It is available at: http://www.fema.gov/business/guide/index.shtm.

FEMA also runs the Emergency Management Institute (http://training.fema.gov/), which offers a wide variety of courses ranging from in-person classroom instruction to a series of free on-line courses that include natural disaster planning. A complete list of FEMA courses is available at http:// training.fema.gov/IS/crslist.asp. These courses are easy to access and can be completed without time restrictions. A short test is usually required in order to obtain credit for completing the course.

Every state has an emergency management agency or support organization, most of which have websites with emergency planning information. For example, the California Governor's Office of Emergency Services (Cal OES) provides useful information that ranges from wildfires to earthquakes to winter storms.

Hopefully, you will never be required to use your emergency plan, but if you do, the planning and training will pay off in many ways.

It's a good idea to check your state's Local Emergency Management Agency for unique plans and guidelines. A complete list of State Emergency Management Agencies is located at: https://www.fema.gov/emergency-management-agencies. Your local emergency planning commission or emergency management office will also be able to provide guidance on county and local guidelines.

It is important to remember that templates and sample emergency plans provided by these resources are only aids to creating a plan. The most useful and flexible plan will be the one that is customized to your facility and considers unique hazards, training, and response capabilities. It cannot be emphasized enough that effective implementation of any emergency plan must be coupled with training of key staff and coordination with the community.

Natural disaster plans must be routinely reviewed and updated with best practices and lessons learned. Hopefully, you will never be required to use your emergency plan, but if you do, the planning and training will pay off in many ways. As rightly stated by FEMA, preparedness is everyone's responsibility – be prepared, responsive and committed.

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