As mandated within Presidential Policy Directive 8 (1), the National Planning Framework defines the five preparedness mission areas of Prevention, Protection, Mitigation, Response, and Recovery (2). Prevention involves the actions necessary to avoid, prevent, or stop a threatened or actual act of terrorism. Protection involves actions directed at securing our country from acts of terrorism, and man-made and natural disasters. Mitigation involves those actions that may be employed prior to an event to either reduce the potential for damage or eliminate the possibility of experiencing adverse consequences associated with its occurrence. Response generally refers to boots-on-the-ground activities or actions in support of an incident action plan (IAP) established to deal with the incident at hand. Recovery includes those efforts directed at returning the community or area back to the point it was prior to the incident or event.

The capability of launching an effective response to major emergencies resulting from natural, technologic, biologic, or societal causes begins with preparation. For purposes of this discussion, the focus is global coordination of overall response effort to incidents (unexpected occurrences) or events (planned or foreseen activities).

Natural Disasters may be experienced as consequences associated with incidents such as hurricanes, floods, tornadoes, volcanoes, earthquakes, and/or mudslides. Technologic Disasters usually involve problems related to man-made infrastructure, such as chemical plant explosions, mining accidents, maritime oil spills, or railroad derailments resulting in spills and/or release of hazardous material. Biologic Disaster refers to occurrences that present the potential to adversely affect the health of living organisms. Societal Disasters generally evolve from incidents involving crime or disorder, terrorism, and/or war. They may also stem from a group, community, culture or region’s inability to meet the needs or address expectations of its constituents or citizenry. While disasters may be accompanied by outbreaks of civil unrest, they are usually a symptom, or form, of protest against current sociopolitical problems.

In preparation for managing potential disasters, the vulnerabilities of a given geographic area, along with susceptible threats and anticipated consequences, must be identified and contingency plans developed. Awareness of the potential for one type of hazard to become the catalyst for related emergencies that, collectively, may become a catastrophic incident is paramount.

Within the United States, assessment of the potential for a natural disaster identifies the West Coast as having the highest probability for catastrophic seismic disturbances, mudslides, and wildfire. The entire Gulf and Eastern coastlines are at risk for the effects of hurricanes, wildfire, and tropical storms. Although not limited to this area by any means, the Midwest is host to an environment conducive to the spawning of tornadoes and associated severe weather. Obviously, northern areas of the United States have experienced significant cold-weather events, such as blizzards and ice storms. While the potential for technologic, environmental, societal, and biologic related disasters may present a higher probability of occurrence in specific areas, based upon community or regional demographics and infrastructure, in general terms they are independent of the borders previously outlined. Phenomena such as these are, of course, seen in our sister countries. For example, over the past several years, there have been incidents of severe flooding and mudslides in Switzerland, Germany, Austria, Moldova, Slovenia, Romania, and Bulgaria (2005) (3); extreme temperatures with attributable deaths in France (2003) as well as other parts of Europe (4); and the effects of the Indian Ocean tsunami in December of 2004 (5).

While much of the information within this chapter was assembled in 2009, several incidents have transpired since that time resulting in new lessons learned, as well the need for preparation of a coordinated response. Some of the more significant response challenges within the United States include: the 2010 Deep Water Horizon Oil Spill, the 2010 Massachusetts Water Main Break, the 2013 Boston Marathon Bombing, the 2013 Denton Texas Fertilizer Plant Explosion, and the 2014 West Virginia Chemical Spill. After-incident critiques have all highlighted the importance of communicating accurately with the public, communicating effectively with all first responders and stakeholders, and coordinating the overall multiagency response effort using a common and unified incident command structure (ICS).

**ORCHESTRATING THE RESPONSE**

In the United States, while it is recognized that immediate command and control of a disaster falls under the local “authority having jurisdiction” (AHJ) within the affected area, a framework exists for accessing additional resources through mutual aid agreements, as well as state and federal assistance. The reality, however, is—and this is a critical issue—that at times, requested resources may take 3 to 5 days to arrive to the disaster area and, depending on the type and severity of the event, requested resources may have been adversely impacted by the same or similar consequences of the disaster. The need for communities to establish and maintain contingency plans addressing anticipated consequences of potential threats and identify regional resources is of utmost importance to emergency management preparedness.

In terms of community emergency response, a disaster is defined as an event that either immediately overwhelms, or is expected to exhaust, available resources; thus “disaster” is context defined. The goals of the emergency management team are to aid the community and responders in stopping the loss and moving from a mode of emergency response to that of
recovery. To meet these goals, community emergency planning efforts for coordinating disaster response include, but are not limited to, the following:

- Familiarization with common “rules of engagement”
- Identify potential hazards, consequences, and issues encountered
- Identify the areas of vulnerability
- Maintain awareness of forecasted occurrence rate of hazards and consequences (often common)
- Prepare for anticipated consequences
- Prepare for accomplishing effective and clear communication with the public

These considerations are addressed in greater detail in the following.

### RULES OF ENGAGEMENT

#### Jurisdictional Authority

Most emergency management personnel recognize the premise that all disasters are local. With this in mind, the need for community and regional organizations to work together to ensure an appropriate jurisdictional response until the arrival of requested resources should be obvious. A solid relationship between emergency managers and community stakeholders (fire departments, emergency medical services (EMSs), law enforcement, public health, educational institutions, and so on) affords the opportunity to achieve effective emergency planning. It is the collaboration and focusing by local and regional organizations on the “big picture” of disaster management that enables support for the community and its emergency responders.

Efforts of an emergency operations center (EOC) to manage the overall response to a disaster benefit greatly from preparatory work accomplished through community contingency planning. Areas addressed through these plans should include, but not be limited to, continuity-of-operation plans for critical facilities, department-specific contingency plans, patient-surge and mass casualty care protocols, arrangements for the provision of food and water for responders and targeted populations, care provisions for persons with special needs, resource coordination and support, temporary housing, utilities, and energy supply. Because of the potential for disruption in normal supply chains, personnel assigned logistical support responsibilities should be directly involved in all preincident contingency planning discussions to ensure that core supplies are identified and are either on-hand or readily accessible to support the missions of critical facilities.

Critical facilities are defined as those whose function and operations are essential to the needs of the community. Included within this designation are hospitals, law enforcement, fire stations, EMSs, public health departments, emergency management, communications, and utilities and their supporting organizations. Within each critical facility or support organization, efforts to establish and practice the National Incident Management System (NIMS, see below) command and control procedures are paramount to achieving a well-coordinated local/state/federal response.

Comprehensive Emergency Management Plans (CEMP) should include reference to specific operational protocols outlining steps for ensuring the delivery of essential functions and/or returning critical facilities to their preimpact operational capability. These types of plans are often referred to as Continuity of Operations Plans (COOP) (6). Within such plans, information outlining an agency’s mission, essential functions, delegations of authority, lines of succession, specialized employee skills, emergency contact information, and basic procedural guidelines for reestablishing operational control of the organization at a secondary location are addressed.

Along with emergency planning, continuity of operations planning, response and recovery programs, efforts to ensure the welfare of employees who are required to remain at a given facility to support of critical operations, must be addressed (7). In addition, identification of safe routes of travel for employees summoned to report for work during times of community emergency must be addressed; this becomes extremely critical during a concurrent community-wide evacuation. Finally, managers of personnel required for incident response and/or support should encourage their employees to complete family planning checklists (8), thereby ensuring their availability to respond in times of need. Through exploration of community resources and an assessment of jurisdictional capabilities, first-response personnel can construct appropriate contingency plans and procedures in advance of a disaster for implementation when need arises.

For example, many large metropolitan areas maintain responders trained to handle emergencies involving building collapse, trench collapse, confined space rescue, elevated rescue, heavy vehicle rescue, machinery extrication, and hazardous material releases or spills. In the absence of local resources, technical teams may need to be summoned to respond and address incidents involving the need for specialized services. Although many areas within the United States possess resources with varied levels of response capability, federal urban search and rescue (USAR) teams exist to support state and local needs through a Governor’s declaration of emergency and subsequent request of federal resources.

Under the Federal Stafford Act (Robert T. Stafford Disaster Relief and Emergency Management Assistance Act, Public Law 93–288, as amended), only the state’s Governor may request federal assistance through the President. With this declaration, channels are opened to localities to receive many types of specialty teams and resources available through federal emergency management authorities. Several examples of specialized medical resources accessible within the National Response Framework (NRF) are found in Table 157.1 (9).

### RULES FOR MANAGING DISASTER RESPONSE

The Incident Commander (IC) should consider employing the concept of unified command. In a unified command, while
input from multiple stakeholders is requested and rapidly attained—aiding in the strategic decision-making process—there is only one overall plan and one collective “team” working common objectives in pursuit of a common set of goals.

Establishing a unified command involves managerial representatives from the various agencies, or “stakeholders,” being present at the command post to provide direct input to the IC. In the setting of a terrorist event, law enforcement officials may initially take the command position, as crisis management activities are paramount, with an eventual passing of command to fire rescue, public works, and/or health department managers for consequence management. As the expertise needed to respond to a given phase of an event shifts, the type of IC required may change; with the incident command structure (ICS), such a handoff of responsibility is easily possible. The unified command structure allows for shifting of responsibility to seamlessly take place as the modes of managing the incident progress from crisis to consequence response. Even in the setting of a unified command, there is only one IC in charge of the overall response at any given time.

The primary rules for dealing with a forecasted or real-time disaster include the following.

Meet the needs of the disaster survivors. Those responsible for managing any emergency will benefit greatly from monitoring the needs of those for whom they are attempting to provide direct services, as well as the needs of their responders. The requirement to engage in an ongoing needs analysis is paramount and must consider the following.

- Basic medical and mental health support
- Provision of food and water
- Security presence

Meet the needs of the responders. If forward incident management teams—incident management planning groups traveling ahead of specific resources—have arrived and completed a preliminary damage assessment and identified areas to be searched, the following additional immediate needs should be recognized.

- Locations and security arrangements for staging areas, base of operations, and USAR missions
- Emergency fuel and maintenance facilities for equipment and apparatus
- Sanitation and decontamination facilities

Many specialty resources—for example, USAR teams—deploy into these areas with the capability to be, literally, self-sufficient for a specified period of time (3–7 days). Identification of resource needs in advance of the incident will ease the burden on the Logistics Branch in their effort to ensure availability of needed items.

Resource Typing

Common terminology relating to resource needs is essential to ensure that emergency managers obtain the proper “tool” for the task at hand. A resource typing system (10) database has been included within the framework of the NIMS for this specific purpose. Groups representing specialists from emergency management, EMSs, fire and hazardous materials, law enforcement, health and medical services, public works, search and rescue, and animal health at local, state, and federal levels provide input for the construction of this list of accessible resources.

Within each category, numeric classification (typing) levels are assigned, indicating the general degree of capability that a given resource possesses, with type I being the greatest, followed by type II, type III, and so on. The specific capabilities each asset type offers—the number of personnel, type of apparatus, specific training levels, equipment, personal protective equipment, etc.—are addressed within each category.

The need to use common terminology becomes apparent when considering disaster response management on a global level. For example, when fire agencies in the eastern part of the United States have requested tanker support, they have, historically, received a truck capable of ferrying hundreds of gallons of water to the scene. On the other hand, when the same request is made by an agency on the West Coast, the result may be the deployment of an aircraft carrying thousands of gallons of fire retardant. Similar concern has arisen in EMS where, in one area of the country, a request for a “rescue unit” has resulted in the provision of an ambulance, whereas in a different geographic region that same request resulted in the provision of a nontransport capable unit equipped with extrication and basic medical equipment. Within the public works services, without capability and resource typing, a piece of heavy equipment might be requested and arrive being either too small or too large for the desired task at hand. The requirement to specifically identify and relay the precise needs of those overseeing the response is critical to the cohesive overall management of the incident and deployment of available resources.

THE NATIONAL INCIDENT MANAGEMENT SYSTEM

In March, 2004, within the United States, Presidential Directive No. 5 (11) was promulgated that established the NIMS (12) as the model for effectively commanding and controlling the response to significant emergencies or disasters. This model identifies organizational branches that an IC may employ to coordinate emergency response.

The Incident Command Structure (ICS) has been likened to a tool box containing organizational tools used to manage an incident regardless of level of complexity or size. The IC maintains the responsibility of ensuring that all elements are addressed to achieve an effective response. Through the use of the ICS, an incident can be managed by a group of individuals overseeing resources within a reasonable span of control. The NIMS may be used by any level of authority, be it the on-scene commander, a municipal, county, or state emergency manager, or federal agencies providing additional resources and assistance. In fact, the organizational concepts are not limited to the management of emergencies.

Incident Command Structure

The command structure begins with the IC and his/her Command Staff consisting of the Safety Officer, Liaison Officer, and Public Information Officer. Beneath this oversight and coordination group are the General Staff Branches, composed of Operations, Planning, Finance, and Logistics. The roles of each position and the manner in which delegated tasks may be organized are identified below.

Incident Commander and Command Staff

The IC is responsible for establishing incident priorities, strategies, and objectives along with overall coordination of
resources to address the emergency event. The IC may also create Command Staff positions that could include the following.

• A Liaison Officer whose job is to aid in coordinating activities with outside agencies.
• A Safety Officer who monitors and anticipates hazardous conditions or unsafe situations, developing and recommending measures for ensuring responder safety.
• A Public Information Officer who manages media responding to the event and, under direction from the IC, releases information regarding the event.

The IC then organizes his or her General Staff to implement the tactics necessary to accomplish the objectives established within the IAP in support of the overall management strategy. Positions within the General Staff include; the Operations Branch, the Planning Branch, the Finance Branch, and the Logistics Branch.

**Operations Branch**

The Operations Branch is responsible for coordinating the tactics of the response so that the strategic initiatives are accomplished. Functioning under the Operations Branch, one may find branches such as public works, health, fire, USAR, hazardous materials, and/or law enforcement. There may also be multi-jurisdictional branches such as local, state, or federal, or geographic branches such as Division 1/Division 2, or East/West.

Reporting to these branches are the specific groups assembled to carry out the strategic initiatives established with the IAP. Examples include, but are certainly not limited to, suppression, search, triage, treatment, surveillance, debris removal, perimeter control, and so on.

**Planning Branch**

The Planning Branch, perhaps obviously, is responsible for developing the IAP from incident-specific information in support of the IC’s strategic initiatives. For example, the IAP may add detail to the IC’s outline of goals and objectives by analyzing damage assessment data, situational reports, resource availability, weather conditions, safety considerations, etc. Reporting to the Planning Branch are functional groups, such as those listed below.

• The Resource Unit, which ensures that all assigned personnel and resources at an incident are categorized by capability and that their status is tracked.
• The Situation Unit collects, processes, and organizes situation information, prepares situation summaries, forecasts, and develops projections of future events related to the incident.
• The Demobilization Unit develops the demobilization plan, including specific instructions for all personnel and resources released from the incident.
• The Documentation Unit maintains complete files of the incident, including a record of all important decisions taken to resolve the incident for legal, analytic, and historical purposes.
• Technical Specialists or subject matter experts may be required to provide technically specific information to aid mitigation efforts.

The IAP is defined as a written1 plan containing general objectives reflecting the overall strategy for management of the incident. It may include identification of operational resources and assignments, along with specific direction and key information for the management of the incident for one or more operational periods. Common examples of IAP components include the following.

• Incident name
• Operational period and mitigation strategy
• Identification of ICS organization
• Resources on scene
• Strike team or unit leaders and staff
• Communications plan and assignments
• Special instructions (weather, hazards, and so on)
• Plan author and approving authority

**Finance Branch**

The Finance Branch is responsible for the facilitation of contractual agreements and documentation of allocated resources to ensure reimbursement for supplies and services required to execute the IAP. Reporting to this group are functional groups such as the following.

• The Compensation/Claims Unit handles injury compensation and claims.
• The Procurement Unit handles all financial matters pertaining to vendor contracts, identifies sources for equipment, and executes equipment rental agreements and supply contracts.
• The Cost Unit maintains and provides cost analysis data for the incident.
• The Time Unit is responsible for recording of personnel time of all relevant agencies.

**Logistics Branch**

Again, as one might expect from the name given this branch, it is responsible for the acquisition of needed equipment and supplies to support the IAP. The Logistics Branch is essentially the backbone of the response as the strategic initiatives are greatly dependent on having the necessary tools, supplies, equipment, and resources to implement the IAP. Reporting to this group may be functional groups such as the following.

• The Supply Unit is responsible for ordering, receiving, storing, and processing all incident-related resources, personnel, and supplies.
• The Ground Support Unit is responsible for maintaining primary tactical apparatus and vehicles, fuel supplies, provision of transportation, usage documentation of all ground equipment, and development of the incident traffic plan.
• The Facilities Unit assembles, maintains, and, ultimately, demobilizes all facilities used to support incident operations.
• The Communications Unit assembles and tests all communications equipment; operates the incident communications center; distributes, repairs, and recovers communications equipment assigned to incident personnel; and develops the incident communications plan for effective use of deployed communications equipment.
• The Medical Unit is responsible for development of the incident medical plan, identifying procedures for managing medical emergencies, and planning for continuity of medical care, including vaccinations, vector control, occupational health, prophylaxis, and mental health services for incident personnel.
• The Food Unit is responsible for supplying the food needs for the entire incident, including all remote locations (e.g., camps, staging areas), as well as food for personnel unable to leave tactical field assignments.

The basic ICS model identifying the IC and Command Staff is presented in Fig. 157.1, with an expanded operations

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1 An IAP may be oral in small incidents.
multijurisdictional ICS model identifying the potential for build-out of managerial branches shown in Figure 157.2. The strength of the ICS is its expandability. Any incident, regardless of type, can be effectively managed by augmenting managerial and support positions, as required. Although many day-to-day operations are managed with one IC absorbing all previously discussed roles, the ability to expand the management structure as the incident grows in size and/or complexity, while using a uniform system, is critical to achieving a successful outcome.

**APPROACH TO EMERGENCY MANAGEMENT**

As previously mentioned, the main elements for managing an emergency or disaster begin with an analysis of the hazards that may affect a given area, the vulnerabilities that exist within that area, the frequency of occurrence of specific hazards, and the anticipated consequences of those hazards in the specific area.

**Goals for Managing Disaster Response**

The responsibility to manage any incident begins with defining pre-established goals that will lead to the successful handling of the emergency, resolution of consequences, and mitigation of the incident itself. The following basic goals outline the steps to surviving the first 72 hours of a disaster.

**Establish Communication with Areas Affected**

Communication with the EOC in the impacted area should occur within 1 hour. This includes the ability to speak with those overseeing emergency management in the impacted area, as well as being able to reach them physically. There may be times when, because of the level of damage and/or destruction of infrastructure, one is limited to verbal communication with those in the impacted area, and resources cannot get to those in need.

**Secure the Area**

Security in the impacted area must be such that the general safety of first responders and disaster workers can be reasonably ensured within the first 12 hours of the event. One of the most recent examples of situations that prevented emergency crews from deploying to target areas was seen associated with the response into some of the areas of New Orleans immediately after Hurricane Katrina. The need for establishing a secured presence also aids in calming surviving populations.
Search the Area
Within our State of Florida, the goal to complete search and rescue operations is set at 24 hours after crews are able to enter the impacted area(s). We point out that this is not a national or international goal—at least at this point—but should be considered for inclusion in any guidelines.

In trauma management, the term the golden hour has been used to identify the desired time frame for delivery of trauma survivors to an appropriate medical facility for surgical intervention. The activities involved in the management of the trauma victim must all be accomplished within the golden hour to allow the patient the best chance for survival. In disaster response, the first 24 hours identifies the golden day. Within this time frame, trapped and injured survivors must be accessed, treated, and relocated to appropriate facilities. The reality is that those surviving the first 24 hours without advanced life support and/or rescue services will generally be able to help meet their own needs in the following days.

For this reason, in forecasted hazards such as hurricanes, USAR assets are usually prepositioned in hardened locations so they may advance to targeted areas as winds subside after the hurricane landfall. This practice affords the ability to initiate search and rescue operations within hours following the event. The trauma victim has to survive the golden hour to make it to intensive care. The comparison can be made that the disaster victim has to make it past the golden day to transition to recovery.

With more advanced technology, USAR crews are beginning to integrate the use of the US national grid system (USNG), which establishes a nationally consistent map and spatial grid reference system. The ability to provide accurate mapping based on precise geopositioning allows for better deployment of resources to achieve rapid primary search and rescue. This system dramatically reduces the potential for duplicative efforts in covering targeted areas.

Meet Basic Human Needs
Private sector retailers are often the best resource in meeting most needs in the aftermath of disaster. Where retailers are unable to open due to damage or lack of resources, emergency managers will need to fill the gaps. Prepositioned cargo transport vehicles containing caches of bottled water, ready-to-eat meals (MREs, or shelf-stable meals composed of both standard and special diet menus), and shelter supplies are extremely beneficial in maintaining a healthy mental outlook and behavior in disaster survivors. Following the restoration of primary communications, these supplies can be moved into impacted areas, providing aid and comfort to those in need. The basic human needs caches include the following.

- Medical supplies
- Water
- Food (MREs)
- Shelter
- Emergency fuel
- Ice—a distant sixth unless the temperature is excessively hot

Restore Critical Infrastructure
The restoration of critical infrastructure is an intrinsic component clearly affecting the survivability of those involved in the incident. The benefits of moving quickly toward a recovery mode, regardless of the timeline for completion, will go a long way to ensuring citizens do not abandon the area. Once a community's population, or a portion of it, retreats and begins to rebuild their lives at alternate locations, they often opt not to return. Through an effective presence of security and observed efforts to restore critical infrastructure, chances of geographic abandonment by large portions of the affected community may be averted. Key elements of critical infrastructure include the following.
- Communications
- Roadways and primary access routes
- Utilities and fuel depots
- Sewer and water systems
- Support for critical facilities
  - Assistance to local governmental organizations
  - Assistance in implementing their continuity of operations plans

Upon restoration of power and return to normal protocols for the delivery and sales of commodities, citizens may begin to assist in their own migration to the recovery mode. It is imperative during this time that public safety messages are released to the public outlining safety-related practices and hazards. They may include issues such as carbon monoxide safety, generator use, emergency fuel storage, downed power line safety, drinking water guidelines, and wildlife advisories.

Open Schools and Local Business
The return to normal activities for children and adults within the impacted area rekindles faith that the event is in transition and efforts to restore their community are underway. Additionally, keeping the schools open will ensure there are no gaps in attaining the educational objectives (i.e., finishing the academic year). Local businesses returning to normal operation is a matter of necessity both for the owners and the community. The longer local businesses remain inoperable, the smaller the chances for a prosperous return of the commercial infrastructure; without the reestablishment of businesses, the community cannot begin to return to a self-sustaining mode.

Begin the Recovery
The goal of stabilization after the incident should occur within the first 72 hours following impact. It must be apparent to onlookers and survivors that the pendulum is beginning to shift toward recovery.

Stabilization includes the completion of search and rescue activities, provision of basic health and mental health services, and the transfer of patients requiring further treatment to appropriate medical facilities—that is, functioning hospitals, dialysis centers, nursing homes, and so forth. The establishment of an adequate supply of potable water for drinking, cooking, and basic sanitation needs, as well as sufficient shelter and feeding capability for those affected, should be accomplished. Arrangements for sustained emergency fuel supplies and power generating equipment should be in place to provide for the continued operation of critical and/or targeted facilities complementing ongoing recovery operations.

Emergency Support Functions
Emergency managers within EOCs use emergency support functions (ESFs) to organize, coordinate, and support the overall response effort (13). The expansion or customization of these ESFs to meet a community’s organizational needs is appropriate. The intent associated with the grouping of ESFs is to enhance efficiency and reduce redundancy or duplication of
The identified training levels, segregated by roles and responsibilities, are outlined below. Specific training opportunities may be accessed via the internet through the Federal Emergency Management Agency (FEMA) and the National Fire Protection Association (NFPA). Entrylevel responders:

- FEMA IS-700; NIMS, An Introduction
- ICS-100; Introduction to the Incident Command System or equivalent

First-line, single resource/field supervisors:

- ICS-700; ICS-100; and ICS-200, Basic Incident Command System or equivalent

Middle management: strike team leaders, division supervisors, EOC staff, and so on:

- ICS-700; ICS-900; National Response Framework; ICS-100; ICS-200; and ICS-300

Command and general staff, area, emergency, and emergency operations center (EOC) managers:

- ICS-700; ICS-900, National Response Framework; ICS-100; ICS-200; ICS-300; and ICS-400

The National Response Framework

The goal of the NRF is generation of a template that all agencies, stakeholders, and response partners may use to effectively communicate, manage, and function in response to a catastrophic disaster. The NRF as required by Presidential Homeland Security Directive (PSD) No. 5, establishes a uniform, all-hazards approach to organizing the management and federal response to major disasters. The NRF is indicated for all incidents requiring a coordinated federal, state, local, tribal, private, and nongovernmental entity response. The NIMS is the framework on which all communication, command, and control will occur to cohesively integrate requested federal resources by a given state.

The use of the Incident Command System (specifically NIMS) was established within PSD No. 5 and applies to all federal, state, local, tribal, private, and nongovernmental public service entities. Eligibility for the receipt of federal funding is contingent on each state’s adoption of NIMS.

### NIMS Training Requirements

Federal, state, local, tribal, private sector, and nongovernmental personnel with direct roles in emergency management or response must complete Incident Command System (ICS) and NIMS training. Included within this targeted group are emergency services disciplines such as public health, hospitals, EMSS, fire service, law enforcement, and emergency management. Additionally, public works, utilities, and support and volunteer personnel all fall into this comprehensive response group.

Although not limited to the following, the list in Table 157.2 identifies ESFs used in the NRF.

#### The National Response Framework

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Emergency Management Agency (FEMA) Incident Command System Resource Center or local emergency management.

**POTENTIAL HAZARDS, CONSEQUENCES, AND ISSUES**

**Hazard Considerations**

In preparation for the coordination of emergency response efforts relating to specific emergencies, the types of hazards that may occur in an area must be considered. These may include but are, of course, not limited to those listed in Table 157.3.

Any of these hazard types may affect a given area coinciding with the local events taking place, such as ongoing special ceremonies or celebrations, mass gatherings, major repairs or renovations to critical infrastructure, and/or localized supply shortages to note only a few possibilities. In other words, the emergency/disaster does not occur out of context, and that context consists of the actual conditions on the ground (at the site) where the event occurs. If, for example, the area infrastructure has been degraded by years of neglect, this element would alter the way the emergency/disaster plays out in the affected area.

Although each incident is unique in its presentation and development, there are common needs associated with all-hazard types, which include, but are not limited to, the need for warning systems, communications, sheltering, management of the injured, provision of security, and debris removal.

**Consequences of the Hazard**

Associated with any hazard exposure is the potential for consequences to an area or jurisdiction. Although these consequences may be unique to a specific type of hazard, more often there are common consequences seen in all disasters regardless of the specific type. For example, a tornado touchdown, hurricane landfall, ice storm, or other severe weather incidents may all result in power outages, disruptions in communications systems, injuries, and debris removal, as well as the mandate to provide citizens with shelter and immediate basic needs.

Disruptions to the telecommunications system may have a dramatic adverse impact on coordination and control initiatives for critical facilities. Alternative communication measures to allow for the provision of situation status reports and relaying resource needs requests must be established for critical facilities. If there is significant damage to the critical infrastructure, it may be necessary to activate continuity of operations plans.

Damage to dense residential areas may necessitate search and rescue operations, as well as implementation of mass casualty plans in response to multiple trapped survivors within collapsed structures or transportation corridors.

Seismic disturbances, which may occur at any moment, provide little or no time for warning and result in damage that ranges from none to massive. In addition, there must be awareness of the potential for aftershocks, which may cause further damage to compromised or collapsed structures where rescue operations may be underway or may affect locations used for mass care and shelter. Geologic disturbances may also trigger associated events such as a tsunami, the most recently seen in Japan in March of 2011. In deep bodies of water, waves spawned by a precipitating event, such as an earthquake, may travel at speeds over 600 km per hour. Computer models for tsunamis along the coast of California, Oregon, and Washington State are showing expected heights from a larger tsunami to be as high as 30 to 70 ft when approaching the coastal shallows (14). With advance warning, citizens can seek high ground and take other protective actions.

Tropical storm systems are usually seasonal and divided into three categories based on sustained wind speed.

- **Tropical depressions:** Sustained winds up to 38 miles per hour
- **Tropical storms:** Sustained winds between 39 and 73 miles per hour
- **Hurricanes:** Sustained winds above 74 miles per hour

Winds associated with a major hurricane and/or tornadoes occurring before, during, and immediately after the hurricane threat has passed can destroy mobile homes, damage or destroy buildings and trees, and disrupt electrical and gas utilities. Similar consequences are also associated with earthquakes, floods, and wildfires. Slower-moving storms generally produce the greatest rainfall totals.

Contingency and emergency plans should take into account areas vulnerable to flooding and identify evacuation routes for citizens, as well as transportation corridors for the delivery of additional supplies. Environmental concerns may be associated with damaged infrastructure and/or contamination of portable water supply. There may also be a need to establish decontamination corridors at medical facilities not only for arriving survivors, but for support personnel as well.

Maritime accidents have the potential to become widespread disasters, as they may lead to hazardous material spills that can potentially destroy a bay’s ecosystem, fishing, tourism, and area industry. A recent example of such an incident is the 900-ft cargo ship *Cosco Busan’s* collision with one of the Bay Bridge support towers in San Francisco Bay, California. The collision caused a breach in the ship’s hull, releasing approximately 58,000 gallons of fuel into the Bay, fouling 40 miles of shoreline from Oakland to Bolinas.

Major fires and wildfires present the potential to threaten life, adversely affect health, and destroy residential, commercial, industrial, agricultural, and specific critical infrastructure. For populations within the general area of a wildfire or major building fire, smoke can easily affect those with respiratory sensitivity who are not imminently threatened by the advancing flames. These types of incidents may also result in the release and/or spread of hazardous materials.

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**TABLE 157.3 Hazardous Incidents That May Require Emergency Response Efforts**

<table>
<thead>
<tr>
<th>Transportation incidents</th>
<th>Severe weather-related events</th>
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<td>Flooding and mudslides</td>
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<td>Large urban fires (conflagrations) and wildfires</td>
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Hazardous materials may be released from their containers due to fire, severe weather, or road, rail, or marine transportation accidents. A significant release of hazardous materials may trigger mass evacuations, result in shelter-in-place directives, or a combination of both strategies. Long-term evacuations may involve providing citizens with shelter options and meeting basic needs.

Radiologic and nuclear jurisdictional consequences should be identified. Current estimates indicate that, in the United States, nearly 3 million people reside within 10 miles of an operating nuclear power plant. Local, state, and federal agencies maintain emergency response plans in the event of a nuclear plant emergency. These generally involve two emergency planning zones, one covering a 10-mile radius from the plant and the second expanded to a radius of 50 miles. Within the 10-mile radius, depending on the specific type of incident, individuals could be harmed through direct radiation exposure. By way of comparison, outside this initial zone and extending to a 50-mile radius, individuals could be subjected to radioactive contamination of food, water, crops, and livestock (14,15).

The effects of any disaster can either be minimized or exacerbated by the presence or absence of available energy supply within the impacted area. Energy is required for daily operations, such as the functioning of hospitals, police and fire stations, preservation of perishable food items and medications, lighting and transportation signaling devices, domestic fuel commerce, structural heating and cooling, lift stations to pump sewage, and water treatment and distribution systems.

Another risk requiring consideration, brought about through technologic enhancements in medical and nursing care, is the increased use of residential stationed medical life support equipment—for example, a ventilator-dependent quadriplegic patient with a home ventilator. The identification of special needs populations within a community allows for the development of contingency plans to address specific requirements, be they special services, sheltering, provision of specialized medical care, priority power restoration, or general transportation. However, again we point out that only with appropriate preincident planning and resource stockpiling/designation will it be possible to properly care for these individuals. Hurricane Katrina, in 2005, highlighted the consequences of inadequate planning and resource availability in the face of a severe weather event.

Power and telecommunications outages may also disrupt all electronic forms of payments, such as debit and credit card payments. Customers and employees remaining in, or evacuating from, affected areas may need unexpectedly large amounts of cash to pay for critical goods or services or to comply with evacuation orders.

Contingency plans, as previously noted, must include procedures and arrangements for ensuring the operation of facilities deemed critical to supporting the community. As an example, in anticipation of hurricanes or other disasters with advance warning, some financial institutions have included within their contingency plans guidelines for ordering large shipments of cash and enhanced security precautions prior to the expected onset of the hazard.

If generators are to be relied on to provide emergency power, procedures for a continued supply of fuel must be developed. Plans identifying additional supplies that are accessible through regional vendors and/or commercial trucking firms should involve memorandums of understanding, which must include backup procedures for ensuring the acquisition of critical supplies during worst case scenarios.

In summary, for each jurisdiction, identifying common consequences experienced by the community via an assessment of various hazards will aid in the construction of an all-hazards CEMP. Every emergency involves, to some degree, the need for public warning or information systems, communications capability, sheltering provisions, management capability for the injured, ensuring security, and debris removal. Thus there is much that can be standardized in the planning and preparation for these disparate occurrences. Emergency managers must focus on the primary rules for dealing with disasters, which will enable them to minimize losses and steer the incident from a response mode to the recovery mode. Efforts to pursue predisaster mitigation projects to lessen, or eliminate, the consequences of an event or hazard should be part of all strategic planning sessions and discussions.

**DISASTER BEHAVIORAL HEALTH**

In disaster situations, survivors experience emotions such as feelings of being at risk of death, in fear or panic, helplessness, despair, and depression associated with separation from loved ones. Efforts to relocate these individuals to safety if possible—calm their fears, rebuild their sense of safety, community, and self-sufficiency, all of which aids in rekindling hope, provide for their basic needs, and attempt to reunite them with family—will aid in beginning the emotional recovery process. Behavioral health issues, including depression, fear, anxiety, and feelings of separation, can occur for days, weeks, months, and in some cases, years. Having a finger on the pulse of the community will allow the responders to gauge the requirement for specialized mental health services to address the needs of the surviving population.

In general terms, disasters often bring out the best and worst in human nature. Episodes of civil disorder often occur as a result of some type of triggering issue, be it economic, political, or related to a volatile community. Although it may be possible, at times, to anticipate the potential for civil disorder in the setting of contentious political or economic events, such events may also be associated with any significant emergency that disrupts the infrastructure of a community. Early efforts to ensure restoration of the citizens’ basic needs will go far to avoiding this consequence.

**AREAS OF VULNERABILITY**

Vulnerability assessments should highlight a community’s weaknesses in the context of specific hazards. Vulnerabilities may include communications and technologic systems, the lack of and need for hardening of critical facilities, flood- or storm-surge prone areas, special needs populations, security issues, operational policies and procedures, etc.

An assessment of a community’s vulnerabilities in the face of a hazard—that is, an emergency/disaster—becomes the blueprint for predisaster mitigation efforts to reduce the potential adverse consequences associated with a hazard affecting an identified vulnerability. Assessment of vulnerabilities involves not only the identification of the specific weakness, but also must include one or more suggested solutions to lessen or eliminate the risk. This is true in general and is of particular
importance for critical facilities, which must conduct vulnerability assessments to determine their mitigation plan.

If the vulnerability, once recognized and addressed, has been dealt with properly, the identified concern/forecasted adverse consequence should be eliminated. Efforts such as these are geared to ensuring continuity of operations throughout the hazard’s impact.

**FREQUENCY OF OCCURRENCE**

There are geographic regions in any country more susceptible to specific hazards during specific times than are others. Each hazard must be evaluated in the context of the geographic and historical probability of its occurrence and/or reocurrence.

Some basic assumptions apply to assessing the frequency of occurrence.

- Tropical systems with the potential to become hurricanes form in the Atlantic waters and the Gulf of Mexico between June 1 and November 30 of each year.
- Seasonal weather events are the primary cause associated with floods.
- Seismic disturbances may occur at any moment, often with little or no warning.
- Each day, hundreds of thousands of gallons and/or pounds of potentially hazardous materials are transported through communities via road, sea, air, and railways.

When assessing the likelihood of occurrence of an incident, many data sources exist in local, state, or federal emergency response records or archived weather data, which will allow the statistical quantification of the risk of any given area that may experience a specific hazard. Comparisons may be drawn with other geographic areas possessing similar characteristics—the hypothesis being, if it happened there, why not here? In contingency planning, the viewpoint is not that it has not happened here, but rather, that it has not happened here yet. Notwithstanding this apparent truism, planning efforts should be greatest in preparation for incidents having the highest potential of occurrence in a given area, with emphasis on the consequences that are expected to occur.

**ANTICIPATED CONSEQUENCES**

With the threats and hazards prone to impacting a given area identified, the probability of experiencing specific consequences may be charted. From the list of consequences anticipated, commonalities may be found in which response considerations, actions, or needs may be similar. An example of such includes the common consequence of power disruption often associated with hurricane landfall, winter storms, mudslides, wildfires, tsunamis, etc. Regardless of the specific type of hazard encountered, it is the consequence(s) that responders must prepare for, equip themselves for, train for, and establish operational plans to address. During planning discussions in which operational and contingency plans are developed, lessons learned from prior response efforts to these common consequences will aid in strengthening the future response. Employing an approach of recognizing common consequences, regardless of them being high level (global) or detailed (focused), affords the planner the ability to identify goals that may work to create a broad or “all-hazards” plan.

**COMMUNICATION WITH THE PUBLIC**

An active public education campaign promoting personal disaster preparedness is critical to ensuring that citizens are best prepared to survive the adverse impact(s) of a disaster upon a community. It is not uncommon that when clear information is unavailable, efforts to “fill in the gaps” with unqualified, and at times inaccurate, information occurs. A mechanism to address these concerns as they evolve should be established through creation of rumor control lines. Effective and accurate communication cannot only be used for life-saving purposes, it aids in ensuring public trust and maintaining organizational credibility.

When multiple agencies and stakeholders coordinate their respective response efforts through a unified command model, the goal of communicating advisories, warnings, and incident status reports to the public through one voice relaying one message is critical. The delivery of conflicting information can dramatically reduce public trust and confidence to the point that future messages are ineffective.

Many tools exist for communicating with the public prior to a disaster, during emergency response, and throughout recovery operations. Methods for communicating with the public include, but are not limited to, public meetings, flyers or brochures, television, radio, social media, and communicating with the public during the course of their duties in-field interactions.

**SUMMARY**

Recognizing that our primary goals are saving lives, providing aid, and stopping the loss associated with natural disasters and/or catastrophic incidents, the unfortunate reality with many response efforts is that, even with the best funded and most competently led response, we are able to make an impacted area merely tolerable. It is only in the months to years following an event that recovery operations and efforts are directed at and—with luck, hard work, and adequate resources—able to restore the community to a predisaster status. If one considers the quality-of-life survivors had before the disaster, depending, of course, on the scale of the incident, it may be several years until the recovery mode is truly completed. Psychological trauma is often long lasting not only for those surviving the disaster, but for those involved in the response as well. To date, there exist areas within South Florida that have still not returned to August 1992 pre-Hurricane Andrew status. This is also true of areas compromised by Hurricane Katrina’s landfall in late August of 2005.

Contingency planning, preparedness, and disaster mitigation efforts are critical elements that affect the overall management and response to disasters. Those placed in charge of managing specialty services must plan activities to ensure, at a minimum, that:

- Critical and/or key personnel are available to respond in an emergency having family emergency plans and methods of emergency communication.
Vulnerabilities are identified and either mitigated or contingency plans established to ensure continuity of operations.

Adequate expendable supplies exist or are readily available through mutual aid agreements or contractual services.

A relationship exists with local emergency management agencies for the timely provision of situation status reports and accessing additional supplies and/or resources.

Basic needs are available for personnel, including food, rest periods, security, housekeeping practices, and other protective measures enabling response and support personnel to focus on their respective responsibilities.

Familiarization with basic principles of incident command, the NIMS, and the NRF.

Failure to focus on the global picture of managing the overall response may end up narrowing one’s view to issues that may appear significant but, in retrospect, were secondary to the primary goals. This can be equated to avoiding focus on an angulated arm fracture when managing the emergency care of the multisystem trauma patient. Akin to the airway, breathing, and circulation (ABCs) principles of basic life support, adhering to the three basic rules for disaster response management will keep the focus on the global picture.

Rule 1: Meet the needs of the disaster survivors.
Rule 2: Meet the needs of the responders.
Rule 3: See rule 1.

After any significant incident or disaster, the need for a thorough critique, identifying practices and procedures that had successful results, as well as those practices and procedures in need of modification for improvement, are critical elements in the path to preparation for the next response. The importance of this is that the next event is when, not if.

References