

Hazard Mitigation Planning

Mitigation

In order to develop an effective mitigation plan for your facility, residents and staff, one must understand several factors. The first factor is geography. Is your facility in an arid, dry region which may be susceptible to brush fires? Is your facility in a plains state where conditions are good for the formation of tornadoes? A facility in a northern state might have to deal with blizzards and power outages. Gulf and Atlantic states have their annual hurricane seasons with which to deal. Related to geography is climate. Heat versus cold. Humidity versus dry and arid.

A good mitigation plan anticipates these conditions. It involves a hazard vulnerability analysis to identify events that may impact a facility's operation. The facility's planners should look to local, state and federal authorities for insight on how to develop a hazards profile based upon the facility's geography, climate and prior history with hazards. Once one has developed a list of potential hazards, such as high winds, ice storms, floods, storm surges, wildfires, and even man-made concerns, such as chemical spills and train derailment, one can evaluate the potential losses and then determine which mitigation measures are prudent to lessen or avoid the costliness of the hazards.

A comprehensive mitigation plan will contain a risk assessment. What is the probability of an event occurring? After determining which events can affect your facility, the second step is to develop hazard event profiles describing the degree of the danger. The third step of the assessment is to evaluate what assets will be affected by the hazard events. Will you have access to supplies; will you have transportation access; will your telephones and internet be working?

Step 1- Identification

Identified Hazard

- Coastal Erosion
- Dust Storm
- Drought
- Earthquake
- Expansive Soil
- Flood
- Fog
- Hailstorm
- High Winds
- Hurricane and Tropical Cyclone
- Ice Storm

- Lightning
- Sea Level Rise
- Severe Summer Weather/Extreme Heat
- Severe Winter Weather/Extreme Cold
- Storm Surge
- Subsidence (Land Loss)
- Tornado
- Wildfire

Man-Made

- Active Shooter
- Chemical Spill
- Explosion (Factory)
- Terrorism
- Train Derailment

Step 2 – Profiling the Hazards

As stated earlier, the risk assessment shall include a description of the location and extent of all natural hazards that can affect the jurisdiction. The plan shall include information on previous occurrences of hazard events and on the probability of future hazard events.

Natural hazards, the largest single contributor to catastrophic or repetitive damage to communities nationwide, evolve from atmospheric, geological, hydrologic, and seismic events. They pose threats in all areas of the United States.

The impact of natural hazards can be local or widespread, predictable or unpredictable. Resulting property and infrastructure damage can range from minor to major, depending on whether hazard events affect major or minor population centers. When the damage to life and property becomes real, not just potential, the event is commonly called a natural disaster.

Risk assessment provides the foundation for the rest of the mitigation planning process. It focuses attention on areas most in need by evaluation, which populations and facilities are most vulnerable to natural hazards and to what extent injuries and damages may occur. It provides:

- The hazards to which the community is susceptible;
- What these hazards can do to the physical, social and economic assets;
- Which areas are most vulnerable to damage from these hazards; and
- The resulting cost of damages or costs avoided through future mitigation projects.

In addition to the description of each hazard, the detailed hazard profiles will discuss:

- How likely it is that a hazard will impact the area (probability); often supported by previous occurrences, with the dates, frequency, extent and damage. When past

events have not occurred, or data is missing or incomplete, probability potential is based on conditions that may cause the hazard even, i.e. dam failure, earthquake, storm surge, etc.

- How severe the hazard will be (magnitude);
- Where the hazards will affect the community (geographic extent or location); and
- Conditions in the community that may increase or reduce the effects of the hazard.

Step 3 – Impact on Assets

The risk assessment shall include a description of the jurisdiction's vulnerability to the hazards described in this section. This description shall include an overall summary of each hazard and its impact on the community. The assessment should describe vulnerability in terms of the types and numbers of buildings, infrastructure, and critical facilities located in the identified hazard area. Your nursing facilities are, obviously, necessary to preserve the safety, health and welfare of the elderly and infirmed residing there. GIS software is invaluable for plotting a facility's location in a floodplain.

The assessment should, also, describe vulnerability in terms of the potential dollar losses to structures and a description of the methodology used to prepare the estimate of said potential losses.

Mitigation Strategy

The hazard mitigation strategy shall include a description of mitigation goals to reduce or avoid long-term vulnerabilities to the identified hazards. One should determine hazard mitigation goals after the risks have been analyzed. The risk assessment consisted of identifying the hazards that affect the vulnerabilities of the facility to the hazards. The goals shall be related to the risk assessment in that they should address ways to reduce the impact of identified hazards on the nursing facilities.

Goals may include:

- Identify and pursue preventative measures that will reduce future damages from disasters.
- Enhance awareness and understanding of disaster preparedness.
- Evaluate and enhance emergency planning efforts and communication with emergency response agencies.
- Facilitate sound development to reduce or eliminate the potential impact of hazards.

Some or all action items may hinge on funding becoming available; therefore, these activities will be accomplished with outside funding. Your Action Plan should serve to deal with changing priorities, administration transitions, and unpredictable funding and still allow for adoption of the plan.

The mitigation strategy shall include a section that identifies and analyzes a comprehensive range of specific mitigation actions and projects being considered to reduce the effects of each hazard, with particular emphasis on new and existing buildings and infrastructure.

Alternatives that will benefit the residents of vulnerable structures should be considered and evaluated according to the necessary level of protection and the benefit cost ratio. It is important to analyze each possible alternative to ensure the result will not adversely affect surrounding structures.

The retrofitting of structures prone to periodic, high winds, thunderstorms or ice storms is an effective mitigation technique to reduce risks to residents and staff as well as minimize property damage. Retrofitting techniques include the elevation of both slab-on-grade and pier-on-beam structures, dry flood proofing, protective barriers, lightning arrestors, roof reinforcement, and installation of generators and storm shutters. Almost any type and size of structure can be elevated so that the lowest floor is above the Base Flood elevation (BFE). FEMA funding through Hazard Mitigation Grant Program (HMGP) may be available for dry flood proofing since nursing homes may be considered commercial structures. Dry flood proofing techniques include the building of floodwalls adjacent to existing walls, the installation of special doors to seal out floodwaters, and special backflow valves for water and sewer lines.

Another cost effective retrofitting technique includes the installation of generators. By preserving power with generators during and after severe storms nursing homes are able to continue to provide critical health care services. The installation of generators serves to assist facilities with problems experienced from flooding, high winds, thunderstorms and ice storms.

By installing storm shutters, the exterior integrity of the nursing home is maintained by protecting the interior of the structure. Hardening and installing storm shutters serves mainly to assist with problems experienced from high winds, thunderstorms and ice storms.

By installing lightning arrestors, nursing homes can help their facilities be protected from lightning hits. How quickly an arrestor can eliminate a surge from a circuit depends on four factors:

- Magnitude of the voltage
- Quantity of the charge
- Speed at which the arrestors start conducting
- Conductivity of the arrestors

Another retrofitting technique would be to bury electric power lines to avoid tree limbs falling on them or from wind damage resulting in a break in service.

Improving the drainage capacity around roads and low-lying areas is a time-tested technique to mitigate flood damage. Maintenance of drainage canals and laterals is essential to maximize their efficiency and continued long term effectiveness.

Every nursing home has some system of drainage around and through its property. These drainage systems must be maintained if they are going to protect the facility from possible floodwaters.

Actions in general to reduce the effects of flooding are widening and deepening the earthen canals, cleaning of existing ditches, and replacing existing culverts, upgrading pumps, and installing check

valves and inverts in certain culverts. Maintaining and improving drainage serves to assist facilities with problems experienced from flooding and severe storms.

Insurance industry and emergency management research has demonstrated that awareness of hazards is not enough. People must know how to prepare for, respond to, and take preventative measures against threats from natural and technological hazards.

Promoting the purchase of flood insurance can greatly decrease the impacts of flooding on facilities by covering the cost of repair.

Regular emergency drills and education on sheltering in place serves to prepare people for natural and technological hazards before they occur, which may save their lives if the hazard does occur. By ensuring that each nursing home has an updated Emergency Plan will greatly help during times of disaster. Each nursing home will then be able to respond quickly and efficiently. Improved coordination between nursing homes and local Emergency Preparedness directors and continued communication will help improve the dissemination of important accurate information. Also, plans should be reviewed at least annually and update as needed.

Emergency Preparedness education of our residents, their families and staff serves to prepare them for problems experienced from flooding, high winds, thunderstorms, ice storms, storm surge, wildfires and other hazards.

The mitigation strategy shall include an action plan describing how the actions will be prioritized, implemented, and administered by the local jurisdiction. Prioritization shall include a special emphasis on the extent to which benefits are maximized according to a cost benefit review of the proposed projects and their associated costs.

An Action Plan should identify specific actions to achieve identified goals, an appropriate lead person for each action, a schedule for accomplishment and suggested funding sources. This plan is intended to offer priorities based on an examination of hazards. The goals are related to the risk assessment in that they address ways to reduce the impact of the identified hazards.

Benefit-cost analysis (BCA) compares the benefits of mitigation measures to the costs, and is a technique used for evaluating the cost-effectiveness of mitigation measures. FEMA requires a BCA for all mitigation projects that receive FEMA funding. For example, one of the most effective mitigation measures identified for repetitively flooded commercial structures is dry floodproofing. It may not be cost effective to floodproof every single repetitively flooded nursing home, but it certainly would be cost effective to floodproof those that cause the largest drain to the National Flood Insurance Program (NFIP).

Another method to help one consider potential action items in a systematic way is the Social, Technical, Administrative, Political, Legal, Economic, and Environmental (STAPLEE) Method. This method weighs the pros and cons of different alternative actions for each of the identified actions and objectives. See below for the STAPLEE Methodology.

STAPLEE Methodology

STAPLEE

Criteria Explanation

S – Social

Mitigation actions are acceptable to the community if they do not adversely affect a particular segment of the population do not cause relocation of lower income people, and if they are compatible with the community's social and cultural values.

T – Technical

Mitigation actions are technically most effective if they provide long term reduction of losses and have minimal secondary adverse impacts.

A – Administrative

Mitigation actions are easier to implement if the jurisdiction has the necessary staffing and funding.

P – Political

Mitigation actions can truly be successful if all stakeholders have been offered an opportunity to participate in the planning process and if there is public support for the action.

L – Legal

It is critical that the jurisdiction or implementing agency has the legal authority to implement and enforce a mitigation section.

E – Economic

Budget constraints can significantly deter the implementation of mitigation actions. Hence, it is important to evaluate whether an action is cost-effective, as determined by a cost benefit review, and possible to fund.

E – Environmental

Sustainable mitigation actions that do not have an adverse effect on the environment, that comply with Federal, State, and local environmental regulations, and that are consistent with the community's environmental goals, have mitigation benefits while being environmentally sound.

The objective here is to have an Action Plan that is realistic, cost effective, and the goals should be attainable.

American Health Care Association has resources, including a federally-approved Hazard Mitigation Plan developed by Louisiana Nursing Home Association, in its emergency preparedness library. You are welcome to access those resources if you should desire to learn more about hazard mitigation.