Mass Evacuation and Sheltering

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FOREWORD

In 2013, NFPA embarked on the development of NFPA 1616, *Standard for Mass Evacuation and Sheltering*. The Technical Committee on Mass Evacuation and Sheltering is responsible for the administration of this activity, and they are in the process of seeking to clarify the available literature and other applicable detailed information in support of this effort.

A compilation of the different laws and how these laws are implemented through the local emergency management infrastructure is recognized as useful information for the NFPA 1616 effort. Currently in the United States, each state empowers the Governor to take actions in time of disaster, but the authority to order and enforce such an order differs in each jurisdictional area. The purpose of this project is to provide a compendium of state mandatory evacuation laws and the mechanism for the enforcement of such laws.

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Founded in 1896, NFPA is a global, nonprofit organization devoted to eliminating death, injury, property and economic loss due to fire, electrical and related hazards. The association delivers information and knowledge through more than 300 consensus codes and standards, research, training, education, outreach and advocacy; and by partnering with others who share an interest in furthering the NFPA mission. All NFPA codes and standards can be viewed online for free. NFPA’s membership totals more than 65,000 individuals around the world.

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Mass Evacuation and Sheltering

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# Table of Contents

Abstract ................................................................................................................................. 3

Introduction .......................................................................................................................... 4

Notification ........................................................................................................................... 5

Shelter in Place ..................................................................................................................... 6

Evacuation Methods ........................................................................................................... 8

Evacuation Perimeters ....................................................................................................... 9

Special Need/ Exempt Population ..................................................................................... 10

Jurisdictional Overlap ...................................................................................................... 11

Post Evacuation Recourse Deployment ............................................................................. 11

Re-entry ............................................................................................................................... 12

Discussion .......................................................................................................................... 13

Conclusion .......................................................................................................................... 15

Works Cited ......................................................................................................................... 16
Abstract

Emergencies requiring mass evacuation differ greatly depending on geographic and demographic locations. Without the ability to create site specific evacuation plans, the National Fire Protection Association (NFPA) has created NFPA 1616 to assist in the development and implementation of Mass Evacuation and Sheltering. This report will describe the best practices of municipalities and hazard related industries for evacuation and preparedness among all emergency responses and how to implement or modify plans depending on jurisdictional preference.

The analysis will also cover jurisdictional overlap and the rights of the Authority Having Jurisdiction (AHJ) during different types of emergency situations. During the event of a mass evacuation there is no substitute to proper planning and preparation, and useful relationships between neighboring jurisdictions should be developed before the event. This paper is a compilation of research from various planning documents and post-incident reports of historic mass evacuation events. The relevant evacuation size discussed throughout the paper is generalized but will encompass mass evacuations from single occupancy through a city evacuation.
Introduction

Evacuation laws and their enforcement are vital to the well-being of people during an emergency and these laws vary from state to state. Although emergency evacuation is beneficial for emergency operations and managers, it brings on substantial liability for the authority calling for an evacuation. As NFPA 1616, *Standard for Mass Evacuation and Sheltering* is published, AHJ’s must be certain that calling for a mandatory evacuation or sheltering in place is necessary and will benefit the parties involved. Though the emergency response will be dynamic depending on the events and location, the evacuation can follow general implementation methods to improve the effectiveness.

Evacuations for large scale disasters have previously been categorized in two ways: pre-event and post-event. Pre-event planning must consider the notification that will be used to alert the public (including mass communication systems and social media), as well as implications of special need populations and how they will be evacuated. Post-event evacuation should deal with the mobilization of essential needs for the affected population. Though the National Fire Protection Association gives these recommendations in the *Fire Protection Handbook* (Cote, 2008), state and local laws that govern evacuation have no guide for the implementation methods that should be used. This report will give recommended implementation practices for the following: notification systems, evacuation methods, security of evacuation perimeters, special need/exempt population, jurisdiction overlap, post evacuation resource deployment, and reopening and reoccupation of evacuated areas.

Before an evacuation is declared, policy makers, emergency responders, and Emergency Operation Center (EOC) managers need to weigh the benefits against the dangers of an evacuation (which can be done through methods such as a cost benefit analysis). A common misconception of evacuation is that it eliminates danger, when in fact there is a danger associated with evacuating people and individuals have been injured or killed during evacuations (Abelman, 2007). Sheltering in place can be considered,
but there should not be hesitation in mobilizing resources for an evacuation. These considerations must be based on the incident at hand and the proper hazard understanding and preplanning (by the emergency management and authority having jurisdiction) of the community. These details will be expanded upon later in the paper.

**Notification**

When preparing for evacuation notification, there must be pre-thought as to what goes into the message. Five warning message qualities have been found to influence behavior: (1) Credibility of source; (2) official status of source, (3) specificity of content, (4) number of contradictory messages, and (5) length of forewarning period (Collins, 2004). Mass notification systems will have a large influence on the success of the evacuation. Demographics will change the method of notification and which warning method will be most reliable and effective. For example, in rural and hazard specific locations, reverse 911 calling may be the most efficient way to get information to occupants in a timely manner. In demographic locations that have a high population density, a siren type system may be the fastest and most efficient way to notify. The television along with text messages, reverse 911, radios, websites, and intercoms can all be used as a notification system to help alert people of an evacuation. According to a sampled population by Karl Rufener, television was rated as the “best” alerting medium by each age group, but several persons noted that power outage would affect this system (Rufener, 2008). With an increased number of individuals using social media, the authority should use websites such as Facebook and Twitter to aid in the notification to individuals not using televisions or radios. If the evacuated area is a community, there are likely to be volunteers that help in the assistance of evacuating people with special needs. Research suggests that if affected individuals in a crowd are not known to each other at some level, it is less likely that they will rely on each other for assistance during an unanticipated event (Goplin, 2012). If proper
notification systems are successfully alerting all individuals, emergency personnel could be used elsewhere in the evacuation process. Using emergency responders as door-to-door contacts should be reserved for the discretion of the incident commander. This is not recommended because it will exhaust the number of recourses and personnel that can be used elsewhere. If the public trusts that the authority has the proper knowledge and training to understand the hazards, they will be most likely heed the warnings. During an emergency, the public is more apt to evacuate when they can actually see the hazard; if there are problems getting the community to evacuate, it has been reported that persuasion rather than ordering was employed, and households were warned of the danger and urged to leave (Abelman, 2007). Authorities that have had issues with evacuating residents during conflagrations, in most instances, it is not worth the resources to argue with individuals trying to stay. The majority of individuals understand the risk when opting to stay through an emergency. Emergency personnel can make efforts to convince citizens, but it is up to the individual to decide when to move on and provide aid somewhere else.

**Shelter in Place**

If sheltering in place can provide the community with the same level of protection from an emergency incident as mass evacuation, this will be the recommended practice to use (Huntzinger, 2010). This will reduce risk of injury or illness from relocating away from homes and care facilities. Sheltering in place is a technique that cannot be used for every emergency, and will be heavily dependent on the geography and demographics of the emergency. In the event of an earthquake, the best course of action would not be to evacuate the building. It is recommended to find shelter inside a building away from windows. However, not every community has the same potential for hazards. The most important aspect of sheltering in place is the public’s knowledge about the potential hazard risk in their community. If the community has a petrochemical facility, the local manager of the company and
AHJ must have the means available to give basic hazard information to the public. In this situation, the community must understand the dangers to being exposed to hazardous chemicals in case of an accidental release, but they must also know that sheltering in place may be a viable option to keeping themselves safe from a chemical release. The Massachusetts shelter in place manual list a case study that states the officials in Bhopal, India, estimated 50% of the victims could have been saved using a shelter in place plan during the Bhopal, India Chemical release (DeLorie, 2004). While this is an extreme case of a chemical release, it highlights the importance of proper education and choosing between mass evacuations or sheltering in place. In circumstances where individual action can be taken to defend property while sheltering in place, such as during wildfires, the AHJ must be cognizant of the community’s risk and the building owners’ ability to defend their property. If the authority does not mandate an evacuation and only recommends the evacuation, homeowners are free to defend their property. It is important to note that sheltering in place in this circumstance is not for everyone. Only those who have fully prepared, and are of sound body and mind, should considering defending and sheltering in place. The young, old, and infirmed should evacuate well ahead of the fire (Lindroth, 2005). If the homeowner wishes to take this approach, but does not evacuate an individual that cannot evacuate themselves such as a child, the AHJ has the power to take said individual for their own protection as long as there is an ordinance or other law in place. From what several responders have seen, most individuals with dependents do not hesitate on the evacuation. If there is any resistance, the resident has been issued a verbal warning that legal action could take place if evacuation does not occur (therefore it is important that emergency responders and emergency management understand the laws). This is generally enough to make the individual to leave. If it is not, there must be little hesitation to call upon police assistance to aid in the custody of the dependent. Though sheltering in place can be a good safety method for a majority of the population, there still needs to be access for critical individuals to make it to work. These individuals may include nurses, emergency dispatchers, and public works
personnel. Dependent on the emergency, the authority should have plans in place. If the emergency is a flood, public and private boats can be used by various organizations to transport people and necessary items. In a blizzard situations, private off road vehicle clubs with a relationship with the authority can be utilized to transport individuals to work, and items such as medication to individuals in need. There are many different situational solutions to problems, and critical thinking and preplanning to mitigate the effects should be considered.

**Evacuation Methods**

Once the notification to evacuate has occurred, the evacuation route must be properly managed to safely and effectively get individuals out of the evacuated area. If the evacuation is used as a protective measure with an ample amount of time, the evacuation route should be able to let individuals come to retrieve important items before fully evacuating. These situations may include wildfires, hurricanes, floods etc. However, there must still be a cutoff time as to when individuals can continue entering the evacuated area. Once the cutoff time has been met, entrance security must maintain the closure of the area. The concept of last minute evacuation is extremely risky, and places the resident, emergency crews and buildings in substantial danger (Lindroth, 2005). Preplanning for natural disaster should minimize the need for last minute evacuation, but it is not always feasible. Unplanned releases of chemical, terrorist attacks, and weather change are all potential situations where this would be the only option for evacuating. When these situations occur, plans should include the use of law enforcement and public works or street department personnel to turn all streets in the vicinity of the hazard into one way control flow corridors going away from the hazard (Goplin, 2012). This practice may be familiar to situations involving stadiums or large assembly occupancies, but should be able to be implemented on larger public roads. If an evacuation is implemented, there must be a consideration to the staffing resources that will be needed to direct traffic and to block off roads that could cause backflow of traffic or lead to a hazardous condition.
A study of the Big Thompson Canyon Flood which occurred in 1976, found that people who received warning during the flood were not necessarily advised on what to do, or where to go and were consequently killed while trying to drive out of the canyon (Collins, 2004). Once the evacuation is complete and individuals successfully leave the hazardous area, securing the entry perimeter should be considered. There must also be consideration into what should be done if the evacuation route is cut off. If it is a long evacuation route, the authority may consider bringing in temporary shelters depending on the hazard. If this is not a viable option, there should be secondary plans on where to take the evacuees. Once again, this will have to be dependent on the situation and what hazards are present at the time.

**Evacuation Perimeters**

Evacuation perimeters set by the emergency authority must have some form of security to ensure there is none of the following: premature re-entry leading to individual harm or death, looting of vacant buildings, malicious activity against emergency operations, and damage to public and private property. If the evacuation comes with a declaration of a state of emergency, the respective State, Territory, or Tribe can call upon the National Guard to help maintain security at the entry and exit locations. While conditions are suitable and deemed safe, local Police should monitor the evacuated area to ensure there is no trespassing from non-emergency personnel. According to a 2005 interview between Major Bill Nelson of the Larimer County Sheriff’s Office (Colorado) and the Colorado Attorney General’s Assistant, Jeannie Smith, Smith explains “once a resident has voluntarily evacuated, even though they may have had the evacuation order presented to them as mandatory, they will be prevented from re-entering. Those residents that did not evacuate must stay on their own property. If found using a public road or interfering with an emergency worker in performance of duty, they may be arrested and removed from the area” (Lindroth, 2005). There may be exceptions as to specific individuals that can remain in the evacuation area depending on the type of emergency presented at the time and the decision made by the local authority.
Certain industries may take hours or days to shut down their processes and may require individuals to stay within the facility and shelter in place. This may include, but is not limited to nuclear facilities, semiconductor facilities, and petrochemical plants. In these situations, the AHJ should have emergency preplanning conversations with the facility manager to ensure both parties understand what needs to occur at the facility. If an employee is an essential part to the shutdown process, they are permitted to stay. All other nonessential employees should be evacuated. Individuals that are working as healthcare workers at hospitals or other healthcare facilities may stay longer during the evacuation until the proper assistance is provided to evacuate the individuals with special needs.

**Special Need/ Exempt Population**

The definition of an individual with special needs will vary depending on location, but as a guide, the City of Jacksonville defines a special needs patient as, “A person qualifying for special needs is someone who is medically dependent on electricity (i.e. electricity needed for life supporting equipment). This may also include a person with regular need for assistance with medication and/or observation, dementia, chronic conditions that require assistance and persons with contagious health conditions that require minimal precautions or isolation” Where the State of Missouri defines a special needs person as any individual, group, or community whose age, physical, mental, emotional, cognitive, cultural, ethnic, socio-economic status, language, citizenship status, or any other circumstance creates barriers to understanding or the ability to act/react in the manner in which the general population has been requested to proceed during all phases of emergency management (Gianccone, 2008). When special needs individuals are involved, there should be proper accommodations made to ensure their safety. This includes special notification, transportation and sheltering. If volunteers or neighbors are able to assist with these accommodations, that will be sufficient for evacuation. If not, the AHJ must plan to have the capacity to successfully move patients without harm to a safe location. The final location must be able to
meet the minimum requirements to keep the individual safe from any hazard. If the individual is medically unable to care for themselves, they must be transported to the next available care facility with qualified staff. When transporting evacuees to different locations, there must be understanding and cooperation between the various jurisdictional authorities.

**Jurisdictional Overlap**

Relationships between AHJs in surrounding locations should be maintained prior to any emergency event. During the event that involves two or more different authorities, the first effected, or first authority on scene shall take over as the emergency managers. If the lead AHJ feels the emergency response and evacuations can be managed more effectively under the command of another AHJ, they must follow proper National Incident Management System procedures to transfer command. If an evacuation is declared and the emergency agency needs access to private/protected areas, the area owner and AHJ should have verbal or written terms of agreement that allows personnel to the property as long as it is in the community’s best interest. If an emergency is declared, the dynamics of jurisdiction changes significantly. In general, state laws provide the Governor authority to declare an emergency and assume extra powers and responsibilities to protect the health and safety of the citizens of the State. Municipalities, countries, and parishes are given responsibilities to protect the health and safety of their citizens including the authority to order and evacuation of their jurisdiction and to provide first responders (FEMA, 2008).

**Post Evacuation Recourse Deployment**

After the evacuation process occurs, the Authority must have plans as to where all the effected individuals are supposed to migrate and reside. Accommodations must be considered for all special needs individuals and for the individuals with family pets. Providing transportation, and sheltering for family pets
is extremely important and will play a large factor in the success of an evacuation. Individuals may choose not to evacuate if directed to leave their animals behind. If the animal is registered as a service animal that meets the Americans with Disabilities Act (ADA) requirements, under the ADA regulations, service animals have access to the same facilities as the humans they serve. Schools and other public assembly buildings work well for mass sheltering away from the hazard location. There should be room for all individuals moved out of the evacuation zone, however, there is reasonable doubt that 100% of the individuals will stay at the sheltering facility. During the Nanticoke, PA metal processing plant fire in 1987, there were approximately 15,000 evacuees. Of these individuals, only about 2,000 people sought refuge in mass care centers. The remainder either had other homes where they could go or were patients at the nursing homes or hospitals and were evacuated by ambulance or bus to nearby medical centers (Stambaugh, 1987). In the emergency situation where the disaster is widespread and individuals are evacuating to different states the federal agencies, working with state, tribal, and local governments, will ensure the governor(s) of state(s) receiving evacuees from an impacted area agree to accept these individuals prior to evacuations (FEMA, 2008). If ample time is available, the evacuation should be ordered 48 to 72 hours ahead of time to ensure all individuals can make it out safely, and there is enough time to mobilize proper resources and transportation. The authority managing the incident may be responsible for providing public transportation, and basic living supplies. All living supplies should be necessities and not luxury items. There must be a method to distribute food, water, and medication to people and families. This distribution must still be coordinated to occur when people are sheltering in place, and the authority is responsible for finding a reliable and safe mode of transportation to deliver critical supplies.

Re-entry

After the incident has expired and the threat to life and property has diminished, a plan must be in place to allow reentry to the public. Sudden opening of the perimeters should be avoided. The mass
inflow of people will cause heavy traffic bringing an increased risk of injury from motor vehicles. The evacuated perimeter should be opened in segments starting with the perimeter furthest from the incident location. As the public begins the come back to the evacuated area, there should be a heavy presence of law enforcement to aid in the prevention of looting throughout the unpopulated areas. If there is substantial damage to buildings and residential structures that have become uninhabitable, temporary housing may have to be kept open for an extended period, or other housing options should be determined. Building owners should be instructed to contact their respective insurance provider as to compensation and long term housing. If the emergency is due to a hazardous material release, the Department of Homeland Security, FEMA, or the local authority shall construct a long-term community recovery plan to ensure that the affected area is safe for individuals to return and that the infrastructure can sustain a return of the population (FEMA, 2008). Once the full reentry has occurred, the incident management should go through a formal debrief process and decide what techniques worked best, and what could be improved throughout the evacuation process.

**Discussion**

A successful response to an emergency requires a plan based on providing people with the information (which can prove to be difficult) and resources that they require. The plan made in advance of the emergency needs to be coordinated with other agencies and organizations as well as being flexible to adapt to conditions as they change.

When providing notification to people in the community, the message must come from a source that they trust. When planning, it is important to have community leaders involved that can provide insight into the type of information, amount of time required, and effective means of communicating the
message. The message itself needs to include information about the source, hazard, actions required, and time.

In the event of an emergency, there is a choice about the actions for people to take. Both sheltering in place and evacuation are viable options. The choice depends on the threat to people if they stay compared to the potential harm that they could suffer while leaving the area, at the remote location that they go to, and when they return to the area. Even during a single event, it might be appropriate to have some people shelter in place while others evacuate. When developing a plan, the resources available and the impact of people leaving are an important consideration.

With the choice to evacuate, it is important to consider more than just the emergency that is occurring. The perimeter to the area must remain secure to prevent looting and vandalism. Then, once people are allowed to return, order must be maintained to prevent the infrastructure from being overtaxed if everyone returns at once. This may necessitate provisions like opening only portions of the affected area at a time.

When considering special needs populations, all of the issues related to the general population still apply. However there are additional considerations. What other people might view as sufficient to meet the needs of vulnerable populations may not actually be meeting the needs of that community. Thus, it is very important to have people that represent those groups actively involved in the planning process. Additionally, people trusted by that community must effectively distribute accurate information. For example, if a shelter does not allow pets, someone with a service animal may incorrectly think that they will be turned away and/or not allowed to have their animal with them. The result is that many will not evacuate if they don’t think their animal will be allowed to accompany them.

Finally, all of the plans must consider how different agencies will interact before, during, and after an emergency. Relationships established in advance will allow for successful response as conditions
change. This includes needing to know who will be in command and what the responsibilities of each organization will be.

**Conclusion**

Each emergency incident will present different situations and the authority managing the evacuation must continue to think dynamically as to what is in the community’s best interest. Preplanning and training for mass evacuation will be the most effective method to make an evacuation successful and safe. Maintaining strong relationships with neighboring authorities will help with mutual aid and possible evacuation areas for the public. Continually providing the community with truthful information will solidify the trust and confidence of the community making the mobilization for an evacuation easier. If emergency planners want the public to act in a certain manner, it is imperative that information is accurate and specific. (Abelman, 2007) Overall success of a mass evacuation or sheltering in place will be dependent on the nature of the emergency and the independent variables. There is a lot that can be accounted for before an emergency happening, but there will always be situations that are specific to the emergency that must be managed as they happen. Each authority must have the skill and confidence to keep their community safe in the event of an evacuation. Through the entire process, it is important to understand the authority’s technical and legal limits and proficiency levels, and to keep the safety of the emergency responders as the number one priority.
Works Cited


