Expect the Unexpected
The Development & Importance of a Shelter-in-Place Plan

Many organizations have an existing emergency preparedness and response plan that addresses evacuations; however, many organizations omit shelter-in-place (SIP) procedures from these plans due to lack of awareness or failure to believe that the organization is prone to certain emergencies that require SIP procedures to be executed.

Individuals in charge of emergency preparedness and response plans must be proactive and must expect the unexpected. Even though state and local building codes for SIP requirements vary according to location, take the time to consider all of the events that may lead to the activation of SIP procedures for your organization. These events may include natural disasters (e.g., tornadoes, hurricanes, severe hail), chemical, biological or radiological threats (e.g., chemical spills, gas leaks, pandemic, nuclear events), externally contaminated air, extremely hot or cold weather, threats of violence (both internal and external), terrorist threats or manhunts.

This article focuses on situations that are nonviolent in nature (e.g., weather events and chemical spills) and outlines procedures for SIP.

Developing the Plan or Policy
Developing an SIP plan or policy can be a challenging task depending on the size of the organization and facility and the quantity and types of individuals involved (e.g., children in schools, older individuals in nursing homes). The main components of a plan or policy consist of the procedures that will be followed when SIP procedures are initiated, personnel assigned responsibility during an emergency situation and an accountability process. Common questions that will need to be answered during the development of a SIP plan include:

• How do we know to when to execute SIP procedures?
• How do we prepare for an SIP incident?
• Who is responsible for performing each activity?
• How do we account for all individuals in the facility?

Step 1: Preparation
Preparation is a key element in the development of an SIP plan or policy. Preparation includes developing procedures, choosing designated SIP locations throughout the facility, determining the notification system that will be used and creating an emergency kit.

General Procedures
General procedures are required to educate the workforce on the common steps that should be followed during a SIP event. General procedures will not inform those with assigned responsibilities what to do (they will receive training on their duties and responsibilities once they are notified of them), but they provide the steps all other occupants should take once SIP procedures are initiated.

General procedures that may be used during an SIP event include the following:

1) Take cover. Take action quickly. Report to designated SIP locations unless provided with alternate instructions. Ask visitors and contractors to stay indoors as well. Follow all instructions provided by the emergency alert notification system.

2) Stay inside. Wait until the “all clear” is given by the incident commander or emergency responders. Open all windows and doors. Report back to your work area unless otherwise instructed by the incident commander or emergency responders.

At times, sealing the room may also be required to protect occupants from potentially contaminated air outside of the building. Figure 1 shows an example of a room that has been sealed to keep external air out of the SIP location. In this situation, the following procedures may be followed:

Sealing Procedures
1) Use SIP kits to find the appropriate materials.

2) Seal all windows, vents and other sources through which air may enter the SIP location (e.g., fixtures, electrical outlets, pipes, switches).

3) Seal all doors. Apply plastic over the door and use duct tape to seal the bottom.

4) Be sure the duct tape overlaps the edge of the plastic when sealing each area.

A well-developed SIP plan or policy will help minimize panic and will reduce confusion in the event of a SIP event.
Tip: Cut the plastic at least 6 in. larger than openings so you can tape it to the wall or floor (Keys to Safer Schools, 1999).

Make the general procedures specific to your facility and circumstances. Any established procedures should be incorporated into existing emergency preparedness and response plans. Properly train employees to educate them (and facility occupants) of the general SIP procedures to follow when needed. These procedures can be included in new employee orientation and in refresher training. Visitors and contractors should also be briefed on this information or should be issued a general pamphlet or brochure that can be picked up upon entering the building.

Choosing an SIP Location

According to OSHA (2013B), the ideal SIP location is an underground shelter (e.g., basement, storm cellar) that can provide protection to the facility’s occupants. In many buildings, an underground shelter is not available nor a feasible option to construct. In this case, choose a location that is on the lowest floor possible and in the interior of the facility (no exterior walls or doors). If possible, the selected location should have no windows to reduce the risk of injuries from broken glass or easy to seal if a contaminated air threat exists. Select areas where access to facilities (e.g., water, toilets) is available as well. The optimal SIP location is frequently a restroom, a large interior storage room or an interior hallway (connected to a restroom). Avoid areas that have a flat, wide-span roof (e.g., auditoriums, cafeterias, gymnasiums) that only offers minimal protection during a tornado, hurricane or other high-wind event (OSHA, 2013b).

Figures 2 and 3 (pp. 14, 15) show examples of SIP locations for a commercial and multistory building. Ensure that each designated SIP location can adequately hold the number of occupants expected to be in the organization at any given time. Federal Emergency Management Agency (FEMA); (2006) recommends at least 10 sq. ft. per person.

Notification Systems

Organizations must consider the available alert systems, that will be used to effectively communicate the critical information throughout the facility. Keep these considerations in mind:

- Are visual alert systems in place to assist individuals who have difficulty hearing?
- Can alerts be communicated to individuals who understand little or no English?
- What measures are taken to alert individuals with disabilities?
- How can individuals differentiate between SIP alerts and evacuation notifications?
- How will outside personnel (including emergency contacts and parents with children in schools and day-care centers) be notified?
- How will communications between SIP locations take place?

Frequently test the notification systems to ensure that they will function when needed. These tests can be
captured and scheduled in an organization’s preventive maintenance program so they are not overlooked. Also inform the workforce (and other facility occupants) if the notification system will be taken out of service for maintenance.

Emergency Kits

An emergency kit with the essential tools and items needed while taking cover should be stored in each designated SIP location. Consider including the following items in a SIP emergency kit(s):

- the site’s written emergency plan and procedures (especially for sealing a room);
- a roster with all employee (or student) names; this will help managers and supervisors when multiple SIP locations exist and not everyone can be accounted for;
- battery-powered radio;
- a rechargeable flashlight;
- extra batteries;
- first-aid kit;
- water and nonperishable snacks (and a can opener if needed);
- two-way radios (or other communication device, such as mobile phones);
- dust masks;
- towels and washcloths;
- precut plastic sheeting to fit doors, windows and vents;
- duct tape (multiple rolls suggested);
- scissors/utility knives;
- games and books (if children may be involved).

Periodically inspect these SIP kits to ensure that all contents are included. Ensure that all contents are present and in good condition and that the equipment is functional.

Step 2: Authority & Responsibility

After developing an SIP plan or policy, assign individuals with the authority and responsibility to perform specific tasks and procedures. First, a chain of command will be identified and established as part of the plan.

The individual with overall responsibility to initiate an SIP is known as the incident commander. The incident commander is responsible for managing and controlling the procedures taken during an emergency from start to finish. The incident commander coordinates emergency information with all responsible persons to ensure that adequate safety measures are performed during the incident and also leads accountability efforts.

The incident commander can work closely with those who have assigned responsibilities to ensure that comprehensive and effective procedures are developed and executed:

- A safety professional or other designated leader/program owner can develop and organize SIP plans, train personnel on procedures, and communicate updates and changes to the workforce.
- Safety teams can be formed with volunteers from the organization to assist with drills and emergencies to guide employees and other occupants who may be involved (including evacuations when necessary).
- Emergency wardens (typically managers or supervisors) can account for individuals in an SIP

Figure 2 Examples of Internal Shelter Locations at a Commercial Building

location; they may also perform some of the other duties listed.

- Sweeper/monitors can quickly scan the area to ensure that all individuals have responded to the emergency notification.

- "Buddies" can help individuals with disabilities who may have difficulty reporting to a designated SIP location.

- Other individuals can conduct any critical operations that need to be performed (e.g., shut down machinery or equipment), including closing all doors and windows, locking exterior doors, shutting off fans, heaters and air conditioning units and sealing SIP locations when needed.

Identify backup personnel for all individuals with assigned responsibility in case they are out of the facility the day of the incident. Also, determine how the chain of command will be used and how communications will be relayed to the incident commander throughout the situation. Responsibilities should be included in the overall SIP plan and should be communicated to the appropriate personnel so they know which actions to execute.

Step 3: Accountability

Accountability is also an essential step in developing an effective SIP plan or policy. A comprehensive accountability procedure is important because it can save the life of a firefighter or emergency responder who may enter a facility to search for a missing individual during an incident (e.g., fire, crumbling building from natural disaster, terrorist threat). Accountability procedures should consist of headcounts in designated SIP locations, communicating with other emergency wardens in an effort to locate a missing individual and relaying the names and last known locations of any missing personnel to the incident commander. Ensure that a method is in place to account for nonemployees as well (e.g., visitors, contractors, customers).

Exercises, Critiques & Lessons Learned

Exercises are a critical aspect of an emergency preparedness and response plan to ensure that all facets of the program are fully functional. Exercises can show if the developed procedures are effective and if the workforce knows the actions to be taken. Develop a schedule to ensure that SIP exercises are held at least once a year and that employees on every work shift have an opportunity to participate in these drills and to demonstrate they know what to do. Consider setting up roadblocks (e.g., blocked exits, blocked hallways) to fully prepare the workforce for situations where their normal means of egress toward a SIP will not be accessible.

Have someone (or a team) critique these exercises. Ensure that employees know where to go and what to do, notification systems are fully functional and facilities provide safe conditions to the occupants (e.g., unobstructed and lit hallways, aisles wide enough to accommodate occupants, any other hazards).

Document all scheduled exercises and critiques to show the organization has put forth good effort in preparing for an SIP incident. Any deficiencies or weaknesses noted during the exercises should be discussed to identify corrective actions. Lessons learned should be used to update any existing plans, policies or procedures, and should be communicated to the workforce; this will prevent the reoccurrence of these items in future exercises.

Conclusion

A well-developed SIP plan or policy will help minimize panic and will reduce confusion in the event of an SIP event. To review and update the plans as needed, educate personnel on the plans and procedures, and continually practice the established procedures.

Tips and thoughts to consider when developing an SIP plan or policy include:

Figure 3 Examples of Internal Shelter Locations in a Retail/Commercial Multistory Building Using the Parking Garage, Conference Rooms, Data Centers, Stairwells & Elevator Core Areas.

![Figure 3 Examples of Internal Shelter Locations](source: FEMA, 2006.)
• Ensure that written procedures are simple and easy to understand.
• Include procedures for individuals with disabilities or for those with language barriers.
• Appropriately mark all designated SIP locations.
• Consider posting SIP locations on doors entering the facility.
• Enhance emergency maps to show SIP locations. This can be accomplished by highlighting these designated areas on maps and by describing the highlighted area in the key.
• Place “You Are Here” designations on emergency maps so all personnel can easily identify where they are located in the facility.
• Test the emergency alert notification system and address any deficiencies found.
• Conduct inspections of the designated SIP locations to determine if anything has changed (e.g., construction and reconfigurations).
• Periodically inspect SIP kits to ensure that all items are available and functional.
• Incorporate basic emergency procedures and designated SIP locations into new employee orientation and refresher training.
• Brief visitors and contractors on basic emergency procedures, including designated SIP locations; this information may be included in a general pamphlet or brochure that can be picked up upon entering the building.
• Continually practice the procedures to make the workforce more comfortable with them.
• Reduce the risk of carbon monoxide poisoning—never use a generator, grill, camp stove or other gasoline, propane, natural gas or charcoal-burning device in an SIP location.
• Review written SIP plans, policies and procedures at least on an annual basis to ensure that they are still current.
• Update written SIP plans, policies and procedures according to lessons learned during SIP exercises.

REFERENCES

Dan Mahoney, CSP, CIh, received the 2013 ASSE Public Sector Practice Specialty (PSPS) Safety Professional of the Year award at Safety 2013 in Las Vegas, NV, in June. Mahoney has contributed several technical pieces to ASSE and PSPS publications. He has also encouraged knowledge sharing among his colleagues, which has resulted in significant contributions to ASSE’s Body of Knowledge. Mahoney’s continuous contributions to ASSE are cherished, and he has also made profound contributions to the field of safety and the public sector through his work at Glatfelter Public Practice. PSPS is honored to acknowledge him as one of its best and brightest.