Emergency Response Training

How to plan, conduct & evaluate for success

By R. Craig Schroll

EMERGENCIES ARE UNUSUAL EVENTS that involve risk to people, property and/or the environment. The risk element separates emergencies from housekeeping or maintenance-oriented problems. Emergency response preparation is an essential responsibility for all organizations. Training personnel to take appropriate actions during an emergency is a critical element of this preparation. This article examines important issues related to preparing, conducting and evaluating emergency response training.

Emergency response training is any training, for any employee group, designed to improve that group's response to an emergency situation. All personnel need some level of such training; for example, everyone needs to know how to report a fire and what to do should the building fire alarm sound. When assessing specific training needs, several major employee categories should be considered:

- upper management;
- supervisors;
- general employees;
- employees in high-risk areas or operations;
- emergency response team members.

Upper management—both at the plant and corporate level—must be prepared to deal with issues that may arise during an emergency. These executives will not typically be involved in minor emergencies, but they play a critical role in major crises: they will manage the organization's overall response and will deal with the media, regulators, politicians, investors and the public. Supervisors are on the frontline of any crisis, since it is likely that the emergency will initially be reported to a supervisor. His/her actions in the initial minutes of the emergency can have a tremendous impact on the outcome.

General employees must know how to report emergencies and what immediate actions they are expected to take. Those performing high-risk operations should receive additional training since they are more likely to be faced with an emergency. For example, employees in a process operation that uses a highly hazardous chemical should know how to protect themselves during a release and what initial actions to take. Similarly, employees with firewatch duties for hot-work operations should be trained in these special tasks, including the use of fire extinguishers. The organized emergency response team (if one exists within the organization) must be trained to fulfill its role efficiently. In addition, some special employee groups—such as the receptionist and in-house security personnel—must also be considered.

Importance of Training

Emergency response training is a vital element of preparing for emergencies. The effectiveness of in-house response efforts depends largely on the quality and quantity of the training that response personnel have received.

Emergency response activities encompass many situations. Common emergencies include:

- fires;
- medical emergencies;
- HazMat releases;
- special rescues (e.g., confined space).

Other types of emergencies may include:

- incidents of workplace violence;
- bomb threats;
- threats due to external emergencies;
- severe weather;
- power failures.

This article uses HazMat release response as its primary example. Issues to consider when starting an emergency response training program or evaluating an existing program are discussed; recommendations for improving program quality to ensure that it meets organizational needs are provided; and suggestions on different approaches to emergency response training are offered.

R. Craig Schroll, CSP, *is president of FIRECON, a consulting and training company based in East Earl, PA. He has more than 25 years' experience in safety and loss control activities, and is a frequent speaker, author and seminar leader. Schroll is a professional member of ASSE's Philadelphia Chapter and is a member of the Society's Consultants Practice Specialty.*

Challenges of Emergency Response Training

Several characteristics distinguish emergency response training from other types of training.

It is a type of training that workers will hopefully never have to use. Most training is provided to develop knowledge and skills that employees will use and reinforce immediately and continuously in their work. Such is not the case with emergencies. Because opportunities to practice response skills are rare, workers often fail to develop the experience that leads to proficiency. Therefore, regular training and exercises are needed to simulate the development of such experience.

Skills and knowledge that are rarely used must be applied to problems that may present great risk. Emergency response operations generally have a low tolerance for poor decisions and actions. An emergency is a poor environment for the trial-and-error approach—responders must do it right the first time. Taking the wrong action during an emergency can be fatal.

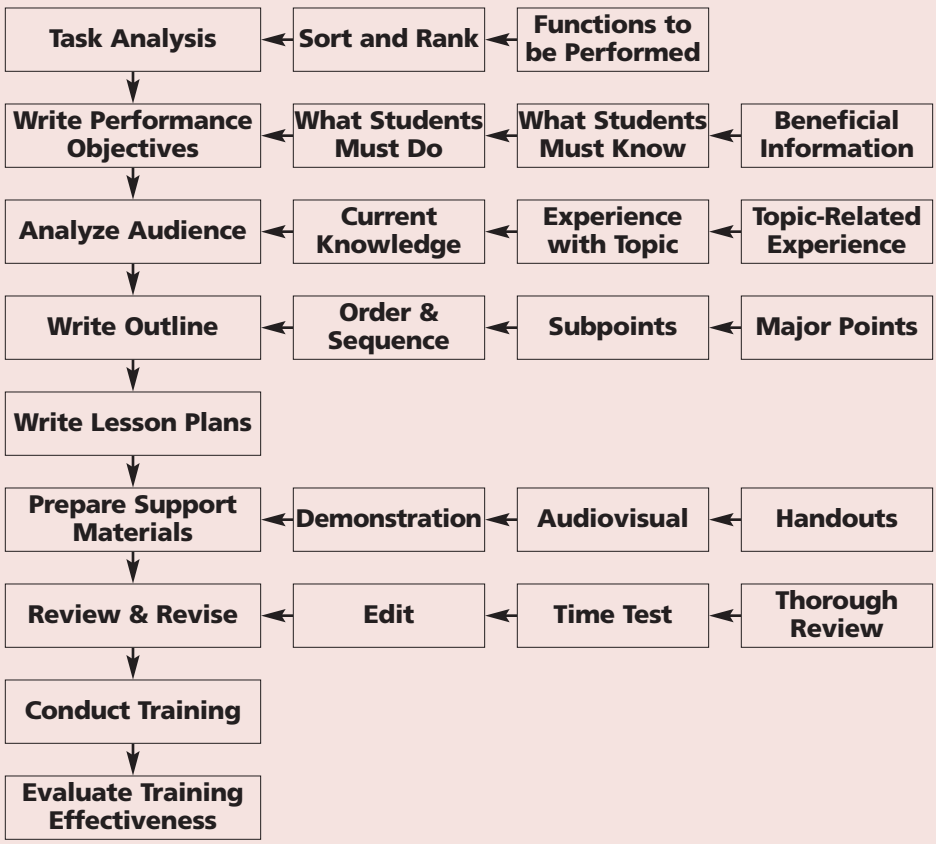
Emergencies are often fast-paced and always dynamic. This presents additional challenges to response personnel. Emergency situations often go from bad to worse if mitigating actions are not taken. They also tend to change constantly, and their pace can draw responders into making rushed decisions and taking hasty actions.

It is impossible to have "seen it all." Emergencies pose a range of problems. Even experienced responders can be surprised if they do not pay attention. No two emergencies are the same.

Regular training and exercises are needed to simulate the development of experience in emergency response.

Figure 1

Training Development



Goals of Emergency Response Training

Three key points serve as the foundation for emergency response training. Employees must learn to:

1) ensure their own safety during response;
2) avoid making the incident worse;
3) provide an effective response that helps resolve the emergency.

Planning & Developing Training

Emergency response training, just like an actual emergency response, must be planned. Failing to do so will prevent the achievement of desired results. Figure 1 highlights the essential elements of the training process.

To determine the extent of training needed, several decisions must be made before work begins on the training program itself. What type of emergency response capability is desired? Will on-site personnel engage in full-scale emergency response or be restricted to initial containment? Will the response group handle all emergencies or only specific types? Such questions must be answered in order to determine the desired response capability. Another important issue is response team organization and establishment. This includes selecting and organizing personnel; equipping the team; and developing

A task analysis considers all activities that response personnel will be expected to perform.

Figure 2

Sample Task Analysis

Task: Don and use a self contained breathing apparatus

#	Item	K	S	E	B
1	Get SCBA	☒	☒	☒	☐
2	Pre-inspection	☒	☒	☒	☐
3	Check pressure	☒	☒	☒	☐
4	Position SCBA for donning	☐	☒	☒	☐
5	Position self for donning	☐	☒	☒	☐
6	Grasp unit	☐	☒	☒	☐
7	Raise unit	☐	☒	☒	☐
8	Swing unit onto back	☐	☒	☒	☐
9	Connect and tighten chest strap	☐	☒	☒	☐
10	Position and tighten shoulder straps	☐	☒	☒	☐
11	Position and snug unit	☐	☒	☒	☐
12	Connect and tighten waist strap	☐	☒	☒	☐
13	Open cylinder valve	☐	☒	☒	☐
14	Recognize that low air alarm is set	☒	☒	☒	☐
15	Check face piece	☒	☒	☒	☐
16	Don face piece	☐	☒	☒	☐
17	Position face piece	☐	☒	☒	☐
18	Tighten face piece straps	☐	☒	☒	☐
19	Test face piece seal	☐	☒	☒	☐
20	Correct seal problems (if necessary)	☐	☒	☒	☐
21	Test exhalation valve	☐	☒	☒	☐
22	Connect low pressure hose	☐	☒	☒	☐
23	Work while wearing unit	☐	☒	☒	☐
24	Shut down operation of unit	☐	☒	☒	☐
25	Remove face piece	☐	☒	☒	☐
26	Remove unit	☐	☒	☒	☐
27	Close cylinder valve	☐	☒	☒	☐
28	Bleed pressure	☐	☒	☒	☐
29	Extend straps on unit	☐	☒	☒	☐
30	Extend straps on face piece	☐	☒	☒	☐
31	Clean face piece	☐	☒	☒	☐
32	Remove used cylinder	☐	☒	☒	☐
33	Install new cylinder	☐	☒	☒	☐
34	Test unit	☐	☒	☒	☐
35	Stow unit in case	☐	☒	☒	☐

K=knowledge, S=skill, E=essential, B=beneficial

standard operating procedures. These issues should be addressed prior to training.

Evaluate Needs

An effective way to evaluate the company's training needs is to conduct a task analysis which considers all activities that response personnel will be expected to perform. This involves listing all tasks that a qualified individual must accomplish to perform the activity being evaluated. This list should include major activities such as: don and use a self-contained breathing apparatus (SCBA); select appropriate protective clothing and equipment; and monitor the atmosphere. To develop this list, it is best to seek input from people who perform the tasks; it is also useful to observe the task being performed by competent individuals.

In the next phase, each step that must be completed to successfully accomplish a given task is assessed. This provides a detailed breakdown of activities that must be covered during training. Once a comprehensive list is developed, items can be sorted and ranked. Based on the author's experience, the most effective categories are skills and knowledge. It is important to distinguish between what personnel must know and what actions they must be able to perform. It is also useful to divide the list into essential versus beneficial items; the essential elements become part of the final training program while the beneficial items may be included as time permits. Figure 2 illustrates a sample task analysis.

Topics to cover in a typical HazMat emergency response training program include:

- general hazardous materials information;
- response precautions;
- health hazards of chemical exposure;
- heat stress;
- HazMat classification systems;
- HazMat recognition and identification;
- reference materials;
- emergency plans and standard operating procedures;
- personal protective clothing and equipment;
- emergency response supplies and equipment;
- command and control;
- decontamination;
- incident termination.

Develop Performance Objectives

Once training needs are established, the trainer must develop specific performance objectives; these identify—in measurable terms—the level of performance that will be expected of personnel after training is completed. The objectives should be put into a logical sequence for training delivery. Performance objectives should include four elements:

1) audience—who is being trained;

2) behavior—the specific activity covered by the objective;

3) condition—the conditions under which the behavior is to be performed;

4) degree—the evaluation criteria for successful completion.

For example, "The emergency responder shall correctly don an SCBA from a storage case in no more than one minute." In this case, the "emergency responder" is the audience; "don an SCBA" is the behavior; "from a storage case" is a condition; and within "one minute" and "correctly" are the degree elements. Performance objectives should also be action-oriented. For example, the term "understand" is often used as part of the behavior element in an objective covering information. By itself, "understand" is difficult to measure; better terms might be explain, list or identify.

Evaluate Trainee Knowledge & Experience

Next, the trainer must assess the trainees' current knowledge base and skills. It is also best to identify what topics may have been covered in other training programs. For example, if all emergency response personnel receive respiratory protection training as part of the company's normal safety training process, that aspect need not be covered.

If participants have some of the skills needed, the level of those skills should be assessed. Skills that are used frequently may not need to be covered provided performance has been adequate. For example, maintenance personnel on the response team should not need training on basic tool use. The trainer must also consider the trainees' level of experience and the student mix. If all the participants have similar experience levels, it will be easier to design the program; it is more challenging to develop training for a diverse group.

If the audience has no direct experience with the topic, related experience that may have an impact on training should be considered. For example, if developing spill handling training for chemical process operators who have no previous emergency response experience, the trainer can take advantage of their knowledge and experience with chemical reactions and processes.

Develop a Training Outline

At this point, an outline listing major points/categories and subpoints of the entire program should be developed. This helps the trainer evaluate the sequence of topics to ensure a logical flow. This is also the best time to make program changes, since revisions become more difficult and more time-consuming after this phase.

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The outline should be evaluated to determine which topics require hands-on training and which can be completed in a classroom setting. This information is then used to develop delivery timeframes, which allow the trainer to check the program against the available time for delivery and make any necessary adjustments. It is important to remember that timeframes mentioned in regulations are minimum numbers. Most regulations that cover any type of emergency response training also mention competence; it often takes more than the minimum number of hours to achieve competence. A quality outline can help justify the request for additional time when necessary.

Using the finished outline and timeframe estimates, the program can be divided into sections for delivery. For example, using the outline, a two-day program can be divided into half-day blocks for delivery. It will be helpful to develop several options to address the issue of scheduling personnel to attend training. Session divisions should not interrupt the flow of information. Typically, it is best to plan four- and eight-hour sessions, since sessions shorter than four hours will break up the flow of material; training time is also lost with a greater number of sessions because it takes more time to set up and clean up. Delivery timeframe estimates should be periodically evaluated and revised as necessary.

Prepare Lesson Plans

Once session divisions have been established, the trainer should prepare lesson plans, which provides the instructor with all the necessary information s/he needs to conduct the sessions. These structured plans should enable any trainer competent in the topic area to conduct the program; they also help to

It is important to distinguish between what personnel must know and what actions they must be able to perform.

Figure 3

Skills Checklist: Donning, Using & Doffing SCBA

#	Task	Fail	NI	Comp
1.	Get SCBA			
2.	Pre-inspection			
3.	Check pressure			
4.	Position SCBA for donning			
5.	Position self for donning			
6.	Grasp unit			
7.	Raise unit			
8.	Swing onto back			
9.	Chest strap			
10.	Shoulder straps			
11.	Position and snug unit			
12.	Waist strap			
13.	Open cylinder valve			
14.	Recognize that low air alarm is set			
15.	Check facepiece			
16.	Don facepiece			
17.	Position facepiece			
18.	Tighten straps (proper order and correct technique)			
19.	Test seal			
20.	Correct seal problems (if necessary)			
21.	Test exhalation valve			
22.	Connect low pressure hose			
23.	Work while wearing unit			
24.	Shut down operation and remove facepiece			
25.	Remove unit			
26.	Close cylinder valve			
27.	Bleed pressure			
28.	Extend straps on unit			
29.	Extend straps of facepiece			
30.	Clean facepiece			
31.	Remove used cylinder			
32.	Install new cylinder			
33.	Test unit			
34.	Stow unit in case			

ensure consistency among various instructors and simplify instructor preparation.

Lesson plan formats vary widely, so the trainer should use what s/he is most comfortable with. The plans typically include various elements:

- title and topic category;
- timeframe;
- materials needed (such as training aids and student materials such as notebooks and pencils);
- equipment needed (this includes standard items such as flipcharts, chalkboard, projector and VCR, and special items; for example, to conduct respiratory protection training, the trainer would need samples of the various protective gear used in the organization);
- handouts;
- student preparation issues (use site-specific examples of why the information is important; such examples and cases are excellent tools for preparing students and show them how the information they will learn relates to them personally);
- lesson summary information (an abstract that enables anyone to give a brief overview of what will be covered);
- session outline.

Prepare Support Materials

The supplemental training materials such as handouts, AV programs and demonstration equipment are developed at this stage. Basic handout materials give students information for later reference and may also be illustrations that will be referred to during training. AV aids (e.g., computer projections, overhead transparencies, slides, videotapes) help maintain participants' attention and may improve their retention. Their quality will also impact their effectiveness; it is better to forego AV aids rather than use poor quality ones. In addition, these materials may be customized by using images from the participants' facility. In all cases, it is best to keep slides/transparencies simple. To ensure that participants will be able to see and read the content of these aids, the trainer should test them prior to delivering the program, preferably in a room similar to the one that will be used.

Demonstration equipment is essential as well. For example, to conduct effective hands-on training, the trainer must simulate spills and leaks. It is best to develop simulations for all situations that a given group of responders is likely to encounter. To add realism, use water colored with an environmentally safe dye to simulate the spilled or leaking material. For drum and small container problems, use the

actual containers (preferably new or never used) where possible; if containers have been used, make sure they have been thoroughly cleaned prior to training use. For larger fixed tanks, a 55-gal. drum can be fixed in place as a simulation.

For pipe leaks, maintenance personnel can easily build simulators to provide practice on these situations. The photo on pg. 20 depicts a pipe leak simulation. Theater smoke machines may be used to provide the feel of a vapor cloud or to simulate smoke. Visual stimulus adds to the realism and the reduced visibility can make problems more challenging. Simulation equipment must be changed regularly, particularly for refresher training, to keep the exercises challenging.

Review & Revise

Once all training items have been prepared, the trainer should conduct a comprehensive review of them, and each previous step of the process should be evaluated. If time and resources permit, conduct a time-test presentation of the program. Ideally, this would be a pilot test of the entire course presented to an actual audience who can suggest improvements. Course materials can then be revised accordingly and produced in final form.

Conducting Training

The trainer's most important responsibility is to keep participants safe—which can be a challenge during the skills-building sections of emergency response training. The goal is to make training as realistic as possible, but realism must be effectively balanced with safety. Therefore, the instructor must ensure that the training environment is properly prepared, which requires consideration of many factors. For example, training during hot weather will require an adequate rest area and a supply of drinking water or other fluid replacements.

The program should be heavily weighted toward hands-on activities. The higher the level of response the organization expects, the more critical the hands-on component becomes. Emergency response is a physical skill that requires practice. Simply hearing how it should be performed is not sufficient. Practice sessions should present situations that truly test participants' abilities.

It is also beneficial to encourage mistakes during training. Mistakes are an excellent learning tool. Participants have nothing to lose in the training environment and must be encouraged to try new techniques and approaches. Throughout, the trainer must emphasize the safety of response personnel; give trainees the information they need to avoid making the incident worse; and teach them to focus on containment and control.

Evaluate Training Effectiveness

Evaluating training effectiveness is an essential part of the training process. Monitoring for improvement in actual job performance is the best evaluation, but this is difficult to do with emergency response training. Therefore, testing and periodic drills can help determine how well training is working. A skills checklist (Figure 3) can facilitate the evaluation of skill retention.

Evaluation of training is a continuous process designed to find ways to improve the impact of training efforts. In the final analysis, the performance of emergency response personnel during an actual emergency is the best evaluation. As noted, however, ideally, participants will never need to use their emergency response knowledge and skills. Therefore, when an emergency does occur, a comprehensive post-incident critique is critical as it provides an occasion to review lessons learned and apply that information to future training.

Conclusion

Properly designed, prepared and conducted emergency response training can have a major, positive impact on an organization's ability to effectively handle emergencies. This is an essential part of any effective loss prevention and control effort. Having a team of highly competent individuals who can get the job done is the ultimate objective. ■

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