

# PREPARING THE EXPERTS FOR EMERGENCIES

**J. D. Brown**

Associate Professor

Fire Protection and Safety Technology, Oklahoma State University

## Introduction

The Hebrew writer, Solomon, wrote thousands of years ago "there is nothing new under the sun." This paper too contains nothing new. However, many ideas and beneficial practices have been developed and used to success. This paper is a compilation of those with perhaps a different focus, which, in the author's opinion, deserves consideration for adoption as part of the preparation for emergency response by those represented at this conference. Judgment of the applicability and usefulness of these ideas are left to the reader. The author has approached the subject from the viewpoint of an engineer and educator.

In the course of medium to large-scale emergencies a wide variety of skills and knowledge is required in order to deal with the crisis adequately and efficiently. Expertise in specialized disciplines is an essential resource for the Incident Commander or Chief Operations Officer. Successful integration of these "experts" into the management of an emergency involves identification of resource needs; a great deal of planning; identification and recruitment of resource needs; training and simulation; and utilization of resources in smaller scale problems.

Expertise needed in an emergency might be grouped into the following areas<sup>1</sup>:

- Transportation
- Communication
- Public Works
- Fire Fighting
- Information and Planning
- Mass Care
- Resource Support (logistics)
- Health & Medical Services
- Urban Search and Rescue
- Hazardous Materials
- Food Assistance
- Energy

The techniques in preparing for emergencies presented in this paper will focus on the preparation of those "experts" whose normal occupation deals with routine, non-emergency duties but who might be called upon to apply their knowledge and skills during an emergency. Those experts such as Fire

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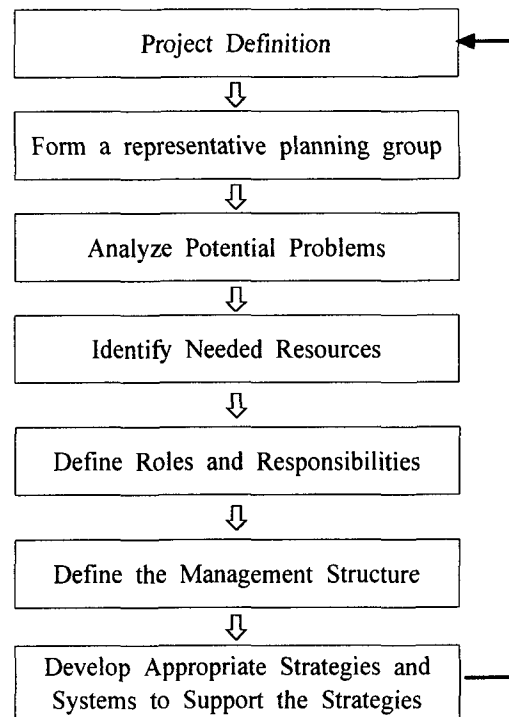
<sup>1</sup> United States of America, Federal Emergency Management Agency, *Federal Response Plan, 9230.1-PL*, April 1999, Emergency Support Functions.

Fighting, Police and Law Enforcement, Health and Medical Services and the Urban Search and Rescue Teams generally have a well-developed process to prepare themselves for emergencies.

**Identification of resource needs**

A variety of resources will be needed. Anticipation of those needs is an essential part of the emergency planning process. This process grows out of a vulnerability assessment.<sup>2</sup> The vulnerability assessment is the structured process of determining which hazards<sup>3</sup> the organization is most likely to have difficulty dealing with or to be unable to deal with, creating an emergency. Most communities and certainly metropolitan areas must consider multiple hazards that could result in a large-scale emergency. This process grows out of a vulnerability assessment.<sup>4</sup> The vulnerability assessment is the structured process of determining which hazards<sup>5</sup> the organization is most likely to have difficulty dealing with or to be unable to deal with, creating an emergency. Most communities and certainly metropolitan areas must consider multiple hazards that could result in a large-scale emergency as shown in Figure 1<sup>6</sup>. An emergency preparedness project is defined and a planning group formed. The planning group contains a sufficient number of persons from operating departments of the government and non-government groups who have emergency missions. The plan developed by such a group must be the documentation of working agreements and commitments of the various organizations about how they will deal with an emergency.

The World Health Organization<sup>7</sup> (WHO) recommends the members of the planning group be fully aware of their organization's emergency management role, actively involved in that role and of sufficient authority to commit their organization to planning group decisions. They



**Figure 1.** Emergency Planning Process

<sup>2</sup> World Health Organization, *Community Emergency Preparedness: a manual for managers and policy makers*. Geneva, 1999, p. 30.

<sup>3</sup> Defined as any phenomenon which has the potential to cause disruption and damage to people and their environment Ibid, P. 31.

<sup>4</sup> World Health Organization, *Community Emergency Preparedness: a manual for managers and policy makers*. Geneva, 1999, p. 30.

<sup>5</sup> Defined as any phenomenon which has the potential to cause disruption and damage to people and their environment Ibid, P. 31.

<sup>6</sup> Derived from the figure in *Community Emergency Preparedness*, page 74.

<sup>7</sup> Ibid P. 75.

should be capable of being a valuable contributor.

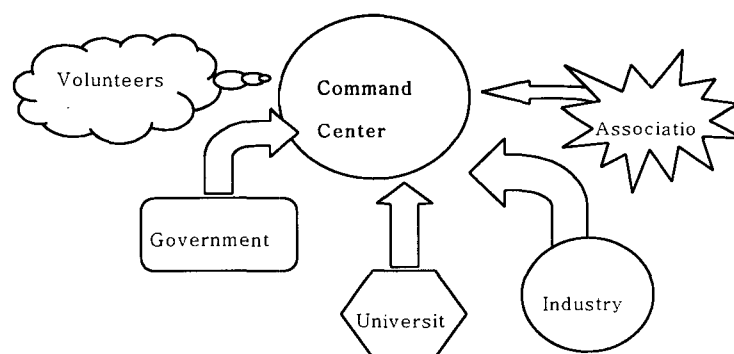
Once the planning group has determined the potential problems associated with the hazards defined by the vulnerability assessment, the next step is to identify resource needs such as<sup>8</sup>:

- Law enforcement
- Fire/rescue
- Utilities (electricity, water, heating fuels, etc.)
- Logistics
- Communications
- Medical
- Hazardous Materials
- Public Information
- Industry support
- Transportation

Once resource needs have been identified, the manager must determine how to access those resources. Logically, much of the resources will come from local government, regional and/or national government resources, the private sector and finally international assistance. Additional spontaneous volunteers may have skills that can be used effectively. In the first hours following a disaster, the resources will come from those in the closest proximity. Emergency management planners must prepare both the plan and the people for that situation.

### **Definition of roles and responsibilities**

The "experts" that we are focusing on in this paper are those who are providing specialized technical assistance such as engineers, communications specialists, transportation experts, and so forth. Some of these experts are part of existing formal emergency response teams. Others will be required because of the nature of the infrastructure that could be affected by the emergency situation(s) as defined in the vulnerability assessment. Coordination and collaboration of "experts" must be managed. Failure to



**Figure 2.** Sources of Expertise

<sup>8</sup> International City/County Management Association, *Developing an Emergency Operations Center*, IQ Service Report (monograph), Volume 30, No. 7, July 1998.

manage the experts may cause delays. Failure to consider the merits of divergent views may cause additional casualties. The first step in managing these experts is to clearly define roles and responsibilities. The second step is to anticipate where additional expertise will be needed or at least valuable. Sources of this additional expertise should be identified. Sources of engineering assistance could come from engineering groups associated with government agencies, engineering departments at local universities, engineering departments from local industry, and contacts with professional organizations. Many of these "experts" will also come from volunteer disaster response organizations. It can also be expected that spontaneous volunteers will have some expertise that could be useful if it can be properly assessed and managed.

### **Case studies:**

Volunteer engineers conducted free assessments of flood-damaged properties in North Carolina after Hurricane Floyd devastated the area. The engineers, who are all members of the Professional Engineers of North Carolina, received special training in order to help them assess the homes. More than 100 engineers conducted thousands of assessments. The engineers typically worked 12-hour days. The hazards in the flooded areas included snakes and other vermin as well as the hazards associated with damaged structures.<sup>9</sup>

FEMA has organized Project Impact to mobilize the private sector in partnership primarily for mitigation efforts. Such partnerships can also identify sources of expertise. Large scale-impacts may well leave many primary response personnel as victims. It is critical that additional resources be



Federal, state and local officials gather together at Supply One, a Project Impact partner, to mark the role Supply One is taking in assisting local residents.

**Figure 3.** Project Impact (FEMA News Photo)

identified so that personnel who are able to function effectively in the situation can replace critical expertise that has been lost.

The state of Hawaii in the U.S. uses a pool of volunteer structural engineers to assist in performing damage assessments as part of a Federal, state, and county joint assessment team. The volunteering engineers attended a training session sponsored by the State of Hawaii Civil Defense Office on postearthquake safety. The program was started in 1995. The state structural engineers association sponsored the program.<sup>10</sup>

<sup>9</sup> United States of America, Federal Emergency Management Agency, Press Release, Volunteer Engineers Working to Help Communities Recover. October 21, 1999, obtained September 26, 2000 from URL <http://www.fema.gov/hu99/dl292n74.htm>.

<sup>10</sup> United States of America, Federal Emergency Management Agency, *Partnerships in Preparedness: A Compendium of Exemplary Practices in Emergency Management*, December 1995.

## Definition of the Management Structure

All resources have to be managed. This is certainly true of human experts. These "experts" have varying degrees of skill and knowledge levels. These experts bring with them a variety of background experiences. Therefore, these experts will invariably have differing viewpoints on the same situation. The experts may also have different priorities based upon the mission of their organization. For example, a structural engineer assigned to support the search and rescue, is concerned with finding survivors, while the structural engineer supporting the utility restoration effort is concerned with preventing further damage to the water system. In the aftermath of a terrorist attack the structural engineer supporting law enforcement activities is concerned with obtaining and preserving evidence. All are probably personally concerned with the safety of those working in or around the damaged buildings but they will operate and express opinions from different points of view.

Clear lines of authority and a defined mechanism for determining the proper course of action when considering diverse options (and opinions) must be in place and understood. Although a resolution process will cause delay in action, failure to consider the merits of divergent views may cause additional casualties. The key is to develop an appropriate and expeditious process for determining the course of action after views are expressed. For this reason it is important that support experts function in the role of advisor not decision maker. During the rescue efforts after the Alfred P. Murrah Federal Building Bombing (Murrah Building) most issues were resolved in small face-to-face meetings. If a more complex issue arose it was resolved in a formal meeting.<sup>11</sup>

As Chief Gary Marrs of the Oklahoma City Fire Department described,

"At one point in the operation, dealing with a difficult collapse element - a huge suspended slab known as the "Mother Slab"-became the subject of differing opinions from both the engineers and the rescuers. This disagreement slowed search and rescue efforts. The strike team engineers rotated along with each USAR team and there were no established procedures for getting engineers to confer or agree. I called a meeting at midnight of all OKCFD rescue officers, USAR commanders, and FEMA engineers to rectify the situation. I instructed the engineers to put their heads together and deliver a unified plan for dealing with "Mother" by 7 a.m. that morning or they would no longer participate in the rescue effort. We had a plan and operations proceeded unimpeded by disagreements from that point on. We designated one engineer to coordinate the efforts of all others."<sup>12</sup>



**Figure 4.** Urban Search And Rescue Team Survey The Murrah Building Site. (FEMA News Photo).

<sup>11</sup> City of Oklahoma City, *Alfred P. Murrah Federal Building Bombing April 19, 1995: Final Report*, Fire Protection Publications, Stillwater OK, 1996 page 122.

<sup>12</sup> Ibid page 119.

The management structure chosen must enable the organizations to coordinate smoothly. Generally a military structure with a command system such as the Incident Command System (ICS) is preferred for directing operations. In large area disasters it may be necessary to divide the area into zones with a command structure that reports to a central coordinator. For larger scale disasters a separate multi-agency coordination center should be developed for support functions and implemented very early in the incident.<sup>13</sup>

### **Development of Implementation Strategies**

All the effort that has gone before is focused on the development of implementation strategies to deal with an emergency. The WHO describes 6 sectors<sup>14</sup> and the U.S. Federal Emergency management Agency (FEMA) describes 12 support functions.<sup>15</sup> These supporting units are the building blocks for operational strategies that take into account the availability, capability and sources of expertise that can be expected to respond to those emergencies, which were identified during the vulnerability assessment. A lesson from the Murrah Building rescue was that strategies must remain flexible yet the command and control structure must be clear and consistent. No plan will predict every situation. The strategies that are developed as part of the plan set a precedent for those strategies that will be revised or developed during the actual emergency.

**Table 1.** Support to the Emergency Manager

WHO Sectors	FEMA Support Functions
<ul style="list-style-type: none"> <li>• Communications</li> <li>• Police and security</li> <li>• Health and Medical,</li> <li>• Search and Rescue,</li> <li>• Social Welfare,</li> <li>• Transport and lifelines.</li> </ul>	<ul style="list-style-type: none"> <li>• Transportation,</li> <li>• Communication,</li> <li>• Public Works,</li> <li>• Fire Fighting,</li> <li>• Information and Planning,</li> <li>• Mass Care,</li> <li>• Resource Support (logistics),</li> <li>• Health and Medical Services,</li> <li>• Urban Search and Rescue,</li> <li>• Hazardous Materials,</li> <li>• Food Assistance,</li> <li>• Energy.</li> </ul>

### **Training the "Experts" for Emergencies**

Clearly the experts have already been trained in the discipline that makes them valuable to the emergency response effort. What training is then required? Why should the expert devote additional

<sup>13</sup> Ibid pages 234, 395.

<sup>14</sup> World Health Organization, *Community Emergency Preparedness: a manual for managers and policy makers*. Geneva, 1999, p. 84.

<sup>15</sup> United States of America, Federal Emergency Management Agency, *Federal Response Plan, 9230.1-PL*, April 1999, Emergency Support Functions

time and resources to specialized training?

Expertise in engineering, telecommunications, transportation, logistical supply, etc. is normally applied in a relatively, stable orderly environment. There is normally time to resolve differences, consider multiple alternatives and negotiate solutions to problems. Emergencies require swift decisive action. Resolution of differences and consideration of alternatives must occur but must occur rapidly. Therefore the "experts" must learn to apply their expertise in the environment of an emergency situation. Training of the experts involves orienting the experts to the plan. Training must cover the skills, knowledge and *attitudes* necessary to perform specific task during an emergency situation.<sup>16</sup> These experts must see where their contributions fit into the over all scheme. Table 2 summarizes the content that should be in such training.

Experts should, of course, receive specialized skill training where necessary to adapt their skills to specific emergency situations that were identified during the vulnerability assessment or during the planning process. For example, structural engineers may need specialized training on proven emergency shoring procedures and equipment in order to make the transition from design to emergency measures.

In addition training or briefing should explain clearly the possible working conditions, specialized equipment that should be available and specialized equipment from the profession which may not be available under foreseeable circumstances. For example, during the rescue efforts after the Murrah Building Bombing, structural engineers used theodolites, smart levels and "crack monitors" to monitor any movement of structural members during rescue efforts<sup>17</sup>. Laser pointers were used to aid in communication and clearly indicate which parts of the structure were under discussion.

Computing equipment availability may be quite limited and availability of particular pieces of

**Table 2.** Training Orientation Content

Unit	Emergency Plan Training Task			
	Fundamental Activity	Coordination of Effort	Organizational Structure	Mission Orientation
Individual "Expert"	Personal tasks, responsibilities, authority	Responsibilities of colleagues	Reporting relationships inside the support function	Goals and Objectives of the individual "expert"
Support Function	Support Functions Tasks including relationships	Responsibilities of other support functions	Reporting relationships to the coordination center and command structure	Goal(s) of the support function
Multi-agency Coordination Center	Coordination Tasks	Resolution procedures	Reporting requirements	Goals
Emergency Command Center	Tasks as defined by plan	Authority and decision powers	External reporting and accountability	Ultimate goal

<sup>16</sup> United States of America, Federal Emergency Management Agency. *Developing Volunteer Resources: Student Manual*, 1999, page SMV-10.

<sup>17</sup> City of Oklahoma City, *Alfred P. Murrah Federal Building Bombing April 19, 1995: Final Report*, pages 136, 327.

equipment is uncertain especially when considering, earthquake, and tornado or hurricane hazards.

Classroom training experiences are of limited benefit when training the "expert." Lecture, multimedia and workshop sessions serve to provide a framework and orient the expert to the operational setting. These sessions do not actually develop the relationships and skills necessary for the support personnel to be effective during a crisis. In order for an expert to function competently as a member of the support group and assist those managing the emergency, there is a need to develop experience.

Experience may be developed in two ways, actual emergencies and simulation. The best experience is probably derived from dealing with actual smaller scale emergencies. With the exception of Urban Search and Rescue Teams, there is limited opportunity to gain experience during large-scale disasters. Urban Search and Rescue Teams are frequently deployed to provide assistance far from their homes. In addition to providing essential aid to the areas experiencing an emergency situation, they gain experience that will be invaluable should their community experience a large-scale emergency situation. If it is possible to assist or observe emergency operations elsewhere, the organization should pursue those opportunities. It is difficult, however, to manage such training and almost impossible to plan such activity.

Lessons learned during a crisis are not easily forgotten. This is valuable experience that cannot be duplicated and comes at a very high cost. This experience should not be wasted but should be shared. The experience can be shared through meaningful training experiences developed by those who have actually participated in response to large-scale emergency situations.

Simulation can both be planned and managed. Simulation will convey an understanding of working conditions. Therefore preparing experts for emergencies involves putting experts into emergency situations. A "paper plan" which has not been put into testing and practice is an illusion<sup>18</sup>. An emergency plan must be developed and validated through exercise<sup>19</sup>. The relationships developed during exercises and other multi-agency operations are essential in establishing a coordinated interagency response.<sup>20</sup>

### **Exercise the experts**

A variety of methods may be used to simulate emergencies and integrate the experts into the plan. A graduated approach should be taken as experts, particularly volunteer experts, are developed into emergency response personnel. It is seldom a wise thing to plunge the novice into a full-scale multi-agency drill.

FEMA describes 3 levels of exercises for incorporation into the emergency management program. These exercises progress from tabletop exercise to functional exercise to full-scale exercise as the response organization and individuals' level of training increases<sup>21</sup>. Even within each type of exercise,

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<sup>18</sup> Auf Der Heide, Erik, *Disaster Response: Principles of Preparation and Coordination*, C.V. Mosby, St. Louis Mo. 1989.

<sup>19</sup> Factory Mutual Corporation, *Developing a Disaster Plan*, Workshop Notes, 1997.

<sup>20</sup> City of Oklahoma City, *Alfred P. Murrah Federal Building Bombing April 19, 1995: Final Report*, page 121.

<sup>21</sup> Drabek, T.E, and Hoetmer, G.J. (editors), *Emergency Management: Principles and Practice for Local Government*, Washington DC, International City Management Association, 1991, page 187.



the emergency manager, training coordinator, or planner must consider the training and skill level of the participant.

Exercises are important in developing the relationships and decision-making skills that allow a person to function effectively during the stress of an emergency. These skills can be developed preparing for emergencies of different scales and with differing hazards. These skills are transferable from one type of crisis to another. Therefore the scenario and type of exercise used to develop the skills of potential resource experts is less important than the process of forcing the participants to work under pressure on realistic problems using an emergency time scale.

Exercises are the work product of a very special group or people. The design team is usually composed of five to seven committed individuals. The team members need to be<sup>22</sup>:

- Creative and imaginative
- Work well under pressure
- Detail oriented
- Able to keep on schedule
- Willing to question and push their point
- Good at keeping a secret!
- Not a participant in the exercise

### **Tabletop exercises**

Tabletop exercises are an excellent means for training key personnel and response leaders in selected components of the Emergency Plan. The primary purpose of the tabletop exercise is to detect problems in coordination and assess the appropriateness of assigned responsibilities<sup>23</sup>. A desirable benefit of the tabletop exercise is the development of relationships that will be essential to efficient response and recovery efforts during a disaster. Experts whose primary role is advice and problem solving in support of the command center or regional commands will benefit greatly from tabletop exercises. The exercise will also help the manager to determine where additional training may be necessary.

Tabletop exercises need to be designed and planned as any other exercise. The coordinator must<sup>24</sup>:

1. Determine objectives and issues for the exercise
2. Determine the scope and extent of play desirable
3. Determine the focus and format
4. Determine the means of assessment to be used in evaluation of the exercise
5. Establish a work plan and schedule
6. Determine required resources

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<sup>22</sup> Phelps, Regina, *Everything You Need to Know to Conduct an Emergency Exercise*; Presentation to the 10th World Conference on Disaster Management, June 28, 2000; Hamilton, Ontario, Canada.

<sup>23</sup> Drabek, T.E, and Hoetmer, G.J. (editors), *Emergency Management: Principles and Practice for Local Government*, Washington DC, International City Management Association, 1991 page 187.

<sup>24</sup> Gillis, Tracey Knippenburg, *Emergency Exercise Handbook: Evaluate and Integrate Your Company's Plan*, Tulsa OK, PennWell Books, 1996, pages 46-48.

7. Create a design document
8. Secure approvals as required

*Objectives and issues* for the exercise must consider include the current stage of your group's crisis or emergency management capabilities, any identified vulnerabilities or gaps for resolution, and the level of knowledge and understanding for those involved.

The *scope* is based upon the groups' needs as well as the level of knowledge. The scope may be adjusted due to time constraint. *Extent of play* may vary from simple discussion and/or a methodical walk-through to command practice using models and multiple scenarios.

*Focus* can vary from training to validation. Training is focused on building the skill level of the participants. Validation is focused toward assessing the adequacy of the plan and its elements. Format can vary from policy development to process validation. The extent to which the exercise is focused upon training will also influence the type of tabletop exercise selected.

Should the exercise utilize multiple scenarios or a single multiple move scenario? The multiple scenario format is particularly useful when introducing the "players" to the wide range of incidents, which might occur. This enables them to compare and contrast response activities. A single scenario with multiple moves is desirable when the objective is to go through the phases of an operation and understand the different response activities with a time sequence. This format is recommended to validate or train on process. It works well for single teams or multiple teams.

*Assessment* methods should be determined early in the process of designing the exercise. It must be clear how the exercise will be evaluated and how feedback from participants will be collected. Requirements for reporting and/or publishing reports may also influence the selection of assessment methods.

Assessment can include comments made by knowledgeable observers, feedback from the facilitator, minutes of critique sessions involving the participants and evaluation/critique forms. In general, when results and assessments are to be part of a formal written report, the data should be collected using more formal methods. In any case lessons learned should be shared throughout the organizations involved.

The *work plan* should include all the activities and elements that must occur for the exercise to be complete and efficient. This is the roadmap for the design team. The plan should include landmarks and completion deadlines.

*Resource requirements* must be determined. These requirements are usually minimal for tabletop exercises. However, the planner must consider any labor costs for personnel participating in the exercise, personnel resources developing the scenarios as well as facilitators, facility requirements, refreshments, equipment needs, and development resource needs.

The *design document* is a record of all the team's decisions on exercise objectives, scoping of the exercise and the work plan. This is a primary product from the design team's effort. It will include resource requirements and proposed reporting of results. The design document is the vehicle for securing approval from appropriate management and/or political leadership for the exercise.<sup>25</sup>

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<sup>25</sup> Gillis, Tracey Knippenburg, *Emergency Exercise Handbook: Evaluate and Integrate Your Company's Plan*, Tulsa OK, PennWell Books, 1996, pages 49-50.

## Functional Exercises

Functional exercises usually include testing and exercising the direction, control and warning functions coupled with a realistic activation of the Emergency Command Center. Functional exercise can assess the proper allocation of resources. Support units can be exercised using a design that activates the function, provides direction and coordination from the command center and simulated activity for the decision processes that are a necessary part of the support unit's mission.

Functional exercises need to be designed and planned just as any other exercise. The steps in coordination and design are the same steps that were listed for the tabletop exercise except that more resources and personnel are needed in both the design and the facilitation of the exercise. The coordinator still must<sup>26</sup>:

1. Determine objectives and issues for the exercise
2. Determine the scope and extent of the exercise
3. Determine the focus and format for the exercise
4. Determine the means of assessment to be used in evaluation of the exercise
5. Establish a work plan and schedule
6. Determine required resources
7. Create a design document
8. Secure approvals as required

*Objectives and issues* for the functional exercise include the current stage of your group's crisis or emergency management capabilities. Focus the exercise on identified vulnerabilities or gaps for resolution. The exercise should utilize and enhance the level of knowledge and understanding (especially as applied to the hazards associated with potential emergencies) for those involved.

The *scope* must be based upon the support unit's needs as well as the level of knowledge of the experts who are participants. The scope may be adjusted due to time constraint. Extent may vary from

simple command practice using models or computer simulations and multiple scenarios to limited but full-scale response simulations of field conditions.

As in tabletop exercises, the *focus* can vary from training to validation. Training exercises are focused on building the skill level of the participants. Validation exercises are focused toward assessing the adequacy of the plan as it relates to the participating units. *Format* can vary from policy development and testing to process validation. The extent to which the exercise is focused upon training will also



**Figure 2.** OSU students participate in a Hazardous Materials Functional Exercise.

<sup>26</sup> Gillis, Tracy Knippenburg, *Emergency Exercise Handbook: Evaluate and Integrate Your Company's Plan*, Tulsa OK, PennWell Books, 1996, page 51.

influence the type and extent of the functional exercise design that is selected.

For a functional exercise, it is probably best to avoid multiple scenarios within the exercise. A single scenario with multiple moves is more desirable since the primary objective of this type of exercise is to go through the phases of an operation and understand the different response activities and coordination in context with a time and effort sequence. A functional exercise works well for single teams or multiple teams.

*Assessment* methods need to be determined early in the process of designing the exercise. The trainer must understand how the exercise will be evaluated and how feedback from participants will be collected. Requirements for reporting and/or publishing reports may also influence the selection of assessment methods. Photographic or video documentation of the exercise is particularly useful in giving feedback to the participants. The same visual documentation may be used to enhance external reporting.

*Assessment* can include comments made by knowledgeable observers, feedback from the facilitator, minutes of critique sessions involving the participants and evaluation/critique forms. In general, when results and assessments are to be part of a formal written report, the data should be collected using more formal methods. In any case, lessons learned should be shared throughout all of the organizations involved.

The *work plan* should include all the activities and elements that must occur for the exercise to be complete and efficient. The plan should include landmarks and completion deadlines.

*Resource requirements* must be determined for any exercise or training activity. These requirements may vary from minimal to very significant for functional exercises, depending on the scope of the exercise. In addition to the cost of the exercise itself, the planner must consider any labor costs for personnel participating in the exercise, personnel resources developing the scenarios as well as facilitators, facility requirements, "actors", refreshments, equipment needs, etc.

The *design document* is an essential record, which documents all decisions on objectives, scoping and the work plan. It will include reasonable detail of resource requirements and the proposed method of reporting results. The design document is the principal mechanism for communicating the exercise plan to appropriate management and/or political leadership and securing their *approval* for the exercise<sup>27</sup>. A design document should include, as a minimum<sup>28</sup>:

- The goal(s) of the exercise
- Objectives to be met
- Scope of the exercise
- Artificialities and assumptions
- Instructions to participants
- A narrative that sets the situation up for the participants
- A communications directory

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<sup>27</sup> Gillis, Tracey Knippenburg, *Emergency Exercise Handbook: Evaluate and Integrate Your Company's Plan*, Tulsa OK, PennWell Books, 1996, pages 52.

<sup>28</sup> Phelps, Regina, *Everything You Need to Know to Conduct an Emergency Exercise* ; Presentation to the 10th World Conference on Disaster Management, June 28, 2000; Hamilton, Ontario, Canada.

- Assessment methods

### **Full-scale exercises**

Full-scale exercises test the plan and enhance the skills and coordination of all involved. Full-scale exercises are difficult to plan, time consuming, expensive, and absolutely essential for proper development of collaborative effort to be effective. Some times full-scale exercises that target the development and training of a particular support group are initiated.

### **Case Studies**

In February 2000 Search and rescue crews searched for mock victims in the rubble of the former McNichols Sports Arena in Denver, Colorado. It was a full-scale exercise involved 30 separate agencies from Colorado and other Western States. The disaster exercise was geared toward learning and perfecting skills involved in searching severely damaged structures. The hazards faced by the participants were real. Only the victims were not real<sup>29</sup>.

Similarly, AT&T was scheduled to conduct an exercise in Phoenix, Arizona during late October 2000 to test its ability to restore communications services if its local telecommunications center had been destroyed or damaged.<sup>30</sup>

The city of Tulsa, Oklahoma recently took part in a full-scale exercise involving a terrorist incident and chemical release. The exercise involved over 100 "actors" as victims of an explosion, chemical exposure or both. Over 30 agencies of state, local and federal government as well as charitable volunteer organizations participated in the exercise. Experts from the various agencies were involved in communications, infrastructure assessment and protection, and environmental monitoring.<sup>31</sup>

While the stages of planning are essentially the same as for a functional exercise, the numbers increase dramatically. Details must be thoroughly addressed when establishing the objectives and scope of the exercise. For example a full-scale exercise might be intended to exercise the command center under realistic pressures and loads. In other circumstances, the exercise might be designed, as was the AT&T exercise, to test the capabilities of a particular facet of the support structure. The search and rescue exercise in Denver was geared to improve the skill levels of the participants and strengthen relationships and teamwork.

The objectives and scope will drive the focus and format for the exercise. Skill level development demands realistic situations and levels of difficulty that will challenge all participants. Other exercises will demand a large cast to provide realism and high levels of activity in order to create the pressures and stress involved during an emergency. A key group will be the simulation team.<sup>32</sup> The team will need a good knowledge of the organization(s) that are being exercised. The team will need to be

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<sup>29</sup> Vogt, Katherine, Demolished Sports Arena Transformed Into Massive Mock Disaster Site, Associated Press, February 5, 2000.

<sup>30</sup> AT&T to Stage Disaster Recovery Drill, PR Newswire, October 18, 2000.

<sup>31</sup> City of Tulsa Oklahoma, Tulsa Survives Simulated Terrorist Attack, City News, August 2000, pages 10-11.

<sup>32</sup> Phelps, Regina, Everything You Need to Know to Conduct an Emergency Exercise ; Presentation to the 10th World Conference on Disaster Management, June 28, 2000; Hamilton, Ontario, Canada.

people who can be good actors while staying on course with the exercise plan. The team must avoid creating original scenarios during the course of the exercise. Above all the members must be team players.

The means of assessment to be used in evaluation of the exercise will require careful consideration. Often evaluators are used to observe and critique a full-scale exercise. These evaluators or observers must:

- Have a thorough understanding of the emergency plan and the exercise plan
- Understand the processes involved
- Be observant and objective (evaluate actions not people)
- Be available to participate in pre-exercise briefings, exercise and post-exercise review meetings.

At the end of the exercise get general feedback from all participants. Note particularly issues of coordination and communication. Experts need to understand the role they play and to see where they fit into the overall operations. It is important that command and control stay with those who have that responsibility. Experts have the power of knowledge and can assume more responsibility than was delegated to them if given the opportunity. In those cases the differences in opinion can cause substantial delays in operations. Exercises should be used to help these experts understand their roles in the overall response effort.

## **Conclusion**

Preparing the expert for an emergency is an essential but complex process that begins with the identification of the sources for those experts. Relationships are an essential part of the ability of a group of people to work together to solve large-scale problems and reduce the impact the emergency has on those most affected. These relationships must be developed in advance.

While the expert brings a variety of skills to response position, special skills must be developed for the "expert" to function effectively in emergency situations. These skills are developed through experience. This experience must be developed through actual emergencies or through a graded set of simulated experiences.

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