NRT-2

DEVELOPING A HAZARDOUS MATERIALS EXERCISE PROGRAM

A Handbook for State and Local Officials

September 1990

NATIONAL RESPONSE TEAM

To date, the NRT has published the following four documents:

NRT-1 - *Hazardous Materials Emergency Planning Guide (March 1987)*

NRT-1A - *Criteria for Review of Hazardous Materials Emergency Plans (May 1988)*

NRT-2 - *Developing a Hazardous Materials Exercise Program - A Handbook for State and Local Officials (September 1990)*

- *Directory of Federal Information Resources for Emergency Planning and Response (August 1989)*

OSWERNRT-2

National Response Team

of the National Oil and Hazardous Substances Contingency Plan

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The National Response Team (NRT) -- composed of 14 Federal agencies having major responsibilities in environmental, transportation, emergency management, worker safety, and public health areas -- is the national body responsible for coordinating Federal planning, preparedness, and response actions related to oil discharges and hazardous substance releases.

NRT

Environmental Protection Agency

United States Coast Guard

Department of Commerce

Department of Interior

Department of Agriculture

Department of Defense

Department of State

Department of Justice

Department of Transportation

Department of Health and Human Services

Federal Emergency Management Agency

Department of Energy

Department of Labor

Nuclear Regulatory Commission

The NRT member agencies are: Environmental Protection Agency (Chair), Department of Transportation/U.S. Coast Guard (Vice-chair), and Department of Transportation/Research and Special Programs Administration, Department of Commerce, Department of the Interior, Department of Agriculture, Department of Defense, Department of State, Department of Justice, Department of Health and Human Services, Federal Emergency Management Agency, Department of Energy, Department of Labor, and Nuclear Regulatory Commission.

Under the Superfund Amendments and Reauthorization Act of 1986, the NRT is responsible for publishing guidance documents for the preparation and implementation of hazardous substance emergency plans. In 1987, the National Response Team published "NRT-1: Hazardous Materials Emergency Planning Guide." That guidance recommends, among other things, the testing of emergency plans through regularly scheduled exercises. "NRT-2: Developing a Hazardous Materials Exercise Program - A Handbook for State and Local Officials" has been produced to provide guidance for the initial development of (or refinement of an existing) exercise program. Further, it identifies Federal level resources available to States and locals to assist in their implementation of comprehensive exercise programs to assess their hazardous materials plans and annexes. This document is not intended to serve as a basis for formal approval or disapproval of exercise programs; however, its use is encouraged.

The Federal agencies of the National Response Team and thirteen Regional Response Teams are committed to provide ongoing planning, training, and exercise support to enhance preparedness capabilities at local, State, regional, and national levels for hazardous materials contingencies.

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Chair
National Response Team

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National Response Team

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I. INTRODUCTION

A comprehensive exercise program is one of the best means for assessing emergency plans and procedures, for determining the readiness of emergency responders, for resolving questions of coordination and clarifying roles and responsibilities, and for promoting awareness of potential hazards.

This handbook was prepared as guidance by the National Response Team to provide State and local governments with practical advice for developing a comprehensive hazardous materials exercise program. It is not intended to become the basis for a Federal requirement to establish a hazmat exercise program. The purposes of this handbook are many:

- To emphasize the value of exercises in testing and improving emergency plans and training emergency response personnel.
- To provide pointers for selecting the appropriate exercise type and exercise objectives based on community risk, capability, available resources, and level of support from elected officials.
- To apply lessons learned from other exercises and actual incidents.
- To describe Federal and private sector support and assistance available for conducting hazardous materials exercises.

Legislative Background

Public Law 99-499, the Superfund Amendments and Reauthorization Act (SARA), contains some significant new requirements for Federal and State governments and industry related to hazardous materials emergency preparedness and community right-to-know. This law amends the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA).

Title III of SARA, known as the Emergency Planning and Community Right-to-Know Act, requires the Governor of each State to establish a State Emergency Response Commission (SERC). Each SERC, in turn, is required to designate Emergency Planning Districts within the State to facilitate preparation and implementation of emergency plans. Each State Commission is also required (by August 17, 1987) to appoint members of a Local Emergency Planning Committee (LEPC) for each Emergency Planning District. At present, there are more than 3,800 LEPCs across the country.

LEPCs were mandated to prepare emergency plans by October 17, 1988. SARA Title III requires that these plans must include, among other things, "methods and schedules for exercising the plan" (emphasis added). Other LEPC administrative duties related to planning include holding public meetings to discuss emergency plans, taking into account and responding to public comments, and distributing emergency plans. Committees are also responsible for reviewing plans once each year or more frequently as dictated by changed circumstances in the community or at a facility. Finally, Committees are to evaluate the need for resources necessary to develop, implement, and exercise emergency plans. These requirements are described briefly to set the stage for discussing practical advice for the development of a comprehensive hazardous materials exercise program.

Relationship to Multi-Hazard Preparedness

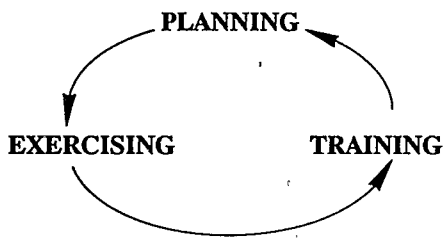
Prior to the passage of SARA Title III, many State and local governments were involved in hazardous materials emergency management programs. In fact, many of the 56 States and territories had included hazardous materials annexes in their emergency operations plans (EOP).

Commonly, State and local emergency operations plans may be divided into three distinct elements: the basic plan, functional annexes, and hazard specific appendixes. Plans developed under Title III have often become the hazardous materials appendix to existing EOPs. The basic plan and functional annexes collectively address the common elements of an emergency response. Hazard specific appendixes contain technical information and details to address the unique risk and characteristics of a particular hazard. This basic approach to planning the integrated emergency management system (IEMS) is intended to facilitate a community planning for each hazard that threatens the particular jurisdiction.

A comprehensive integrated emergency management system is the most effective means for protecting the community from a variety of natural and technological hazards. Through its Comprehensive Cooperative Agreements (CCA), the Federal Emergency Management Agency (FEMA) provides each State a vehicle for applying for and receiving technical and financial assistance to plan and prepare for multiple hazards. One element of the CCA program focuses on exercises to validate emergency preparedness and response capabilities. FEMA does recognize exercises conducted outside the CCA program, such as those exercises encouraged by SARA Title III. For more information on the CCA Program, see Chapter VI, Tapping Additional Resources.

Relationship Between Emergency Preparedness and Exercises

Emergency preparedness is a continuous process with three integral functions: planning, training, and exercising. Each function is dependent upon the other two functions and should not be viewed in isolation. Although the process generally begins with planning, moves to training, to exercising, and back to planning, there is considerable interaction among these functions. The diagram below summarizes where exercises fit into the preparedness process:



PREPAREDNESS: A CONTINUOUS PROCESS

Preparedness activities should not concentrate solely on development of an emergency plan, but should focus upon all functions of the continuous process that result in a response organization being well prepared to meet the needs that arise during a hazardous materials incident. Once a plan has been developed and personnel have been trained to implement the plan, the response organization is then ready to determine if its plan is workable and adequate to meet anticipated needs and if personnel are properly trained.

After completing an exercise, emergency managers should assess the results of the exercise to identify plan and resource strengths and weaknesses and to assess the adequacy of training programs and the need for additional training. This assessment may form the basis for changes to the plan and to the organization's training program, thereby, resulting in a higher level of preparedness for the community. The LEPC, working with the SERC, should facilitate the development of an exercise program as part of the overall preparedness process because: 1) the hazardous materials emergency planning and response organizations are members of the LEPC; 2) Title III reporting information, useful in the exercise development process, is managed by the LEPC; and 3) the development and review of Title III plans are coordinated by the LEPC.

II. BENEFITTING FROM EXERCISES

The question is often asked, "Why conduct exercises?" Exercises serve several important functions for emergency response organizations:

EXERCISES.....

- Provide a means to assess the readiness of State and local emergency plans and response capabilities.
- Test the knowledge and skills of plan implementers.
- Serve as a training tool for emergency response personnel.
- Provide an opportunity to practice skills and improve individual performance under varying degrees of stress.
- Require participants to network with each other and coordinate decisions on resources.
- Provide a means to educate and involve the public, media, and key community organizations in emergency planning.

Some **benefits** of exercises include:

- Readiness for response is increased in the event of an actual emergency.
- Procedural and policy gaps are identified.
- Conflicts are revealed.
- Roles and responsibilities are confirmed.
- Resource needs are identified.
- Effectiveness of training is evaluated and additional training needs are identified.
- Modifications and improvements to emergency plans, procedures, and action checklists are identified based upon the lessons learned from the exercise.
- Hazardous materials responders practice working together as a team.
- Public support is likely to increase for the overall emergency management program.

Teamwork among emergency managers and first responders can be created through emergency exercises. Such teamwork seldom results simply from a group working together and drawing up plans under normal conditions. Paper plans are not enough and are no substitute for an exercise, because normal everyday activities differ from crisis actions.

Exercises provide a sense of urgency, and the exercise scenario requires response organizations to develop alternatives and make decisions under the pressure of time without the possibility of serious consequences. Exercises also lead to an understanding of how to deal with a threat during a crisis - which is not an intuitive skill, but one which must be practiced. Evidence shows that exercises have had a substantial impact on improving performance during an actual emergency.

As part of exercise planning, however, liability issues need to be considered. Before undertaking a hazardous materials exercise, emergency management personnel and those serving as a member of an LEPC should check with the SERC and appropriate city and county attorneys about respective State and local laws and liability protection.

III. SELECTING THE RIGHT TYPE OF HAZARDOUS MATERIALS EXERCISE

A comprehensive hazardous materials exercise program is a goal generally achieved by a response organization over a period of time. Many response organizations will prefer to start out on a small scale and move toward more sophisticated exercises. This handbook has been developed to help response organizations select the right type of exercise to meet specific objectives.

A response organization needs to consider several factors in deciding the scope of a hazardous materials exercise. These factors include:

- Stage of development of emergency response plan and procedures.
- Nature and extent of risk posed by various hazardous materials located in or passing through the community.
- Existing emergency response capabilities of community.
- Cost of the exercise and level of funding available.
- Degree of support from key elected and appointed officials.
- Availability of resources from all sources (Federal, State, local, and private sector).
- Extent to which the response organization can test its response plan while minimizing the impact on its ability to deliver routine services.
- Other exercise requirements mandated by Federal and State agencies.

A comprehensive exercise program must fit the needs and resources of the community. Some type of exercise program should be feasible at all levels of government and in all sizes of towns and cities. *Every community can conduct a hazardous materials exercise with the resources available to it.*

Exercise Participants

The development of any comprehensive exercise program requires sufficient preparation. An effective tool for such preparation is the orientation seminar, which can be used to set up a framework for a comprehensive exercise program, lay a foundation for an individual exercise, or both. These introductory and/or refresher (review) seminars may cover emergency plans and/or procedures, exercise scenarios, and/or objectives.

Orientation seminars are instructional, and are typically presented using lectures, panel discussions, media presentations, and verbal "walk-throughs." The seminars can involve all levels of personnel expected to participate in exercises, particularly emergency responders. The seminars are also frequently used to review lessons learned from actual incidents or "case histories."

A key aspect of orientation seminars is defining the roles of people involved in exercises. Frequently used terms that identify these roles include: players, controllers, evaluators, and observers. Generally, these terms are defined as follows:

PLAYERS - are exercise participants who have assignments in an emergency response organization or team that is committed to execute or support specific Federal, State or local efforts. These assignments can include saving lives, protecting property and public health, obtaining and managing resources, and coordinating with other local, State, and Federal players upon the occurrence of an oil or hazardous material spill or release. Players will make decisions and respond to scenario events in as realistic a manner as possible. All players should be familiar with the emergency response structure, functions, and procedures that they will be expected to perform.

CONTROLLERS - are those persons whose role is to ensure that the exercise objectives are sufficiently exercised to permit evaluation, that the level of activity keeps players occupied and challenged, and that the pace of the exercise proceeds according to the scenario. Controllers answer players' questions and resolve exercise issues as they arise, and monitor the safety of the exercise.

EVALUATORS - are those persons assigned to each major "playing" element to observe the exercise and gather data. Their primary role is to observe actions taken by players and to record their observations. The evaluators' efforts provide the major portion of the documentation necessary to critique the exercise and produce an exercise report. The evaluators may also assist the controllers in keeping the exercise on track, but will not interfere with the players in the performance of their duties.

OBSERVERS - are typically part of an audience who are spectators only.

Each person involved in an exercise plays an important role. A list of potential exercise participants to be considered when planning and exercise can be found in Appendix E. The "players" respond to the events of the scenario or simulated emergency. "Controllers" help guide the scenario by interjecting control messages to ensure that exercise play conforms to the scenario. In a hazardous materials exercise, "observers" might be emergency management/response personnel from the involved community or neighboring communities who are planning their own exercise and may benefit from observing from the sidelines.

The "evaluators" serve as recorders of events. They gather facts, times, events, and details relevant to the exercise. Evaluators assess the actions of the players during the exercise. Evaluators should be trained on evaluation techniques in advance of an exercise.

Evaluators can be emergency management/response personnel from the involved response organization, from neighboring communities, representatives from State and Federal agencies, or other observers. Often times, observers can provide an objective and unbiased view of the exercise.

After the exercise, this objective and factual information collected by the evaluators, and from the controllers and players, becomes the foundation from which an assessment can be made of organizational performance and conclusions can be drawn concerning the strengths and weaknesses of the response

organization. From these conclusions, the results of the exercise are reported, problems or opportunities for improvement are identified, emergency plans and procedures are reviewed and revised, training programs are modified and enhanced, and follow-up exercises are scheduled.

Exercise Types

In recent years, emergency managers have utilized a variety of exercise types to assess the adequacy of emergency plans. A number of these exercises have been conducted with the support of Federal agencies such as the Federal Emergency Management Agency (FEMA), the Environmental Protection Agency (EPA), and the United States Coast Guard (USCG), as well as with the support of private industry. Additional detailed information on exercise support is provided in Chapter VI, Tapping Additional Resources.

Several different terms have been used to describe exercise types. FEMA uses the exercise categories of tabletop, functional, and full-scale. EPA identifies two types of exercises; tabletop and field. USCG uses a functional type exercise called OSC/RRT and a field type exercise known as OSC/Local. Private sector organizations may also classify their exercise types differently from the public sector types.

Table 1 lists the types of exercises employed by EPA, FEMA, and USCG. The groupings of entries in Table 1 indicate that exercises with substantially similar characteristics are given different names by different organizations.

TABLE 1 EXERCISE TYPES

	SPONSORING ORGANIZATIONS		
EXERCISE TYPES	**EPA**	**FEMA**	**USCG**
TABLETOP	X	X	
FUNCTIONAL			
Functional		X	
OSC/RRT			X
FULL-SCALE			
Full-Field	X		
OSC/Local	X		
Full-Scale		X	

In this document, for the purposes of simplicity, increased precision, and internal consistency, three major types of exercises are described in detail below and summarized in Table 2 -- tabletop, functional, and full-scale. Table 2 presents a spectrum of exercise types and characteristics using a hypothetical community. The table is designed to help in the consideration of options during the process of selecting a type and size of exercise. It is aimed particularly at communities that are beginning to develop an exercise program.

Regardless of the type and size of an exercise, hazardous materials exercises have the potential to involve many agencies. At a minimum, hazardous materials exercises should stress the interactions of emergency response organizations and if possible conclude with a written report of exercise activities and recommendations for improvements.

TABLE 2

EXERCISE CHARACTERISTICS FOR A HYPOTHETICAL COMMUNITY

	TABLETOP[a] (Verbal "Walk-Through)	FUNCTIONAL[a] (Limited, Function-Specific Activity)	FULL-SCALE[a] (Extensive Field and Functional Activity)
WHO	• Elected/appointed officials • Key emergency management staff • Numerous local agencies, may include some State and Federal agencies	• Same as Tabletop, plus functional-specific policy and coordination • Numerous local agencies, may include some State and Federal agencies	• Maximum participation of all relevant agencies and personnel
WHAT	• Discuss actions to be taken during simulated emergency situations • Internal coordination activities	• Exercise specific functions, e.g., direction and control, alert and notification • Coordination internally and externally	• Exercise most elements of the plan
WHERE	• Conference room • EOC	• EOC • Scene of functional activities in field (e.g., alert and notification) • Scene of a fixed facility or a transportation incident	• State and local EOCs • Incident command post • Mass care centers, medical facilities, traffic and access control points, equipment staging areas, etc.
WHY	• Practice problem solving	• Test the functional planning and response capabilities of personnel and systems	• Test major portion of the plan with high degree of realism and extensive involvement
EVALUATORS NEEDED	• Typically 1-2[b]	• Typically 4-12[b]	• Typically 10-50[b]
FORMAL CRITIQUE/ EVALUATION[c]	• Oral Critique • Participant Debriefing • Exercise Report	• Oral Critique • Participant Debriefing • Exercise Report	• Oral Critique • Participant Debriefing • Formal Written Report

NOTES: [a]The major differences among the three exercise types is the variation in complexity and size.

[b]These ranges of numbers of evaluators are only examples. For actual exercises, the number of evaluators varies based upon availability, community resources, and the size and type of exercise.

[c]A FEMA Form 95-16 may be completed following an exercise. See Appendix B for a copy of the form.

Tabletop

A tabletop exercise is an activity in which elected or appointed officials and key staff with emergency management responsibilities are gathered together informally, usually in a conference room, to discuss actions to be taken during an emergency based upon the emergency plan and their standard operating procedures (SOPs). The primary characteristic is a verbal "walk through" of a response to an emergency situation. The tabletop exercise is designed to elicit constructive discussion by the participants, without time constraints, as they examine and resolve problems based on the emergency plan.

The purpose of a tabletop exercise is to have participants practice problem-solving and resolve questions of coordination and assignment of responsibilities in a non-threatening format, under minimum stress. Tabletop exercises can be used in preparation for a functional or full-scale exercise.

Tabletop exercises typically involve a limited demonstration of operational response and/or internal coordination activities. In many cases, responders from only a few local agencies are involved. Post-exercise evaluation activities are usually limited to an oral critique session during which recommendations for improvement are discussed with and among participants. A brief written report summarizing exercise activities and recommendations for improvement may also be prepared. The FEMA Form 95-16 may be completed. The use of evaluators who are not players in the exercise can help identify opportunities for improvement. The number of evaluators needed will vary depending upon the size of the community, resources available, and number of functions exercised. One or two evaluators are frequently used, but six or even more could be used for a large exercise. Table 2 summarizes the characteristics of a tabletop exercise in the context of the full spectrum of exercise types for a hypothetical community.

Functional

A functional exercise is more extensive than a tabletop exercise in that activities are conducted beyond a conference room atmosphere. It can take place in some type of Emergency Operating Center (EOC), with concurrent field activity (e.g., at the scene of a simulated transportation related incident). Often times, this type of exercise focuses on a single function or activity within a function (e.g., direction and control). It can also involve deploying equipment in a limited, function-specific, capacity.

The purpose of a functional exercise is to test the planning and response capabilities of personnel and systems relative to the tested function. For example, a direction and control functional exercise would be designed to test and evaluate the centralized emergency operations capability and timely response of one, two, or several units of government under a stressful environment. The exercise might be centered in one or more EOCs or command posts and could either simulate or involve the use of limited outside activity and resources. The level of resources mobilized should be adequate to demonstrate the direction and control operations in response to the simulated emergency.

Another example might be a transportation exercise designed to test the capability of local response officials to establish a command post at the scene and coordinate the on-site response activities with emergency response personnel, the transportation carrier (e.g., railroad, trucking company, airline), and the shipper(s).

The scope of activity in a functional exercise will include more policy and coordination personnel than are usually involved in tabletop exercises. The level of response agency coordination should increase as more agencies from State and local governments participate. Federal participation may also be involved, and include exercise design, coordination, and evaluation support. The number of evaluators needed is usually more than for a tabletop exercise, and four to 12 evaluators is a fairly typical range. These numbers are only examples, however, and the number of evaluators will vary from exercise to exercise, depending on locale, size of the community, resources available, and number of functions exercised. Post-exercise activities often include an oral

critique, and frequently result in a written report of the exercise activity and recommendations for follow-up activity being submitted to local officials. Table 2 summarizes the characteristics of a functional exercise in the context of the full spectrum of exercise types for a hypothetical community.

Full-Scale

A full-scale exercise is used to evaluate response organizations' operational capabilities in an interactive manner over several hours.

The purpose of a full-scale exercise is to test a major portion of the functions in an emergency plan. A full-scale exercise incorporates a high degree of realism, extensive involvement of resources and personnel, and an increased level of stress.

This type of exercise includes mobilization of personnel and resources to many sites (e.g., State and local EOCs, incident command posts, mass care centers, medical facilities, equipment staging areas) and the actual movement of emergency personnel, equipment, and resources required to demonstrate a coordinated response capability.

As with the functional exercise, types of activity will include operations, coordination, and policy-level personnel, but with broader participation. State and Federal participation may include exercise design, coordination, and evaluation support. The number of evaluators is usually more than for either a tabletop or functional exercise, and 10 to 50 evaluators is a fairly typical range. These numbers are only examples, however, and the number of evaluators will vary from exercise to exercise, depending on locale, size of the community, resources available, and number of functions exercised. Post-exercise activities could include an oral critique, a participant debriefing, and generally conclude with a formal written report. Table 2 summarizes the characteristics of a full-scale exercise in the context of the full spectrum of exercise types for a hypothetical community.

IV. AN OVERVIEW OF EXERCISE ACTIVITIES

PREPARATION ACTIVITIES

Once a response organization has an emergency plan in place, certain advance planning activities need to be completed before an exercise is conducted. These activities include: Establishing An Exercise Design Team, Exercise Scale Decisions, Selection of Exercise Objectives, Exercise Scenario Development, Exercise Evaluation, and Training and Exercising. After these advance planning activities have been completed, there are other final preparations which must be completed immediately before the exercise.

Establish An Exercise Design Team

A key element in the successful development of an exercise is to establish an **exercise design team.** The responsibility of the "team" is to select the functions and the objectives of the exercise.

A multi-disciplinary approach to team composition provides an excellent opportunity to understand the needs of others. Team members should be knowledgeable in the disciplines or functions being exercised. It is also beneficial if these persons have experience in emergency management and response, are creative, and possess "team building skills."

The team should include representatives from various local agencies such as fire, police, emergency medical services, emergency management, public works, utilities, schools, hospitals, the weather service, the media (it is advantageous for the public to know you are addressing community needs), and nearby organizations participating through mutual aid agreements. The team should also include industry representatives from the hazardous materials facility, or, for transportation-related scenarios, representatives from the shipper or carrier. Because they will generally be made aware first of unusual and potentially dangerous events, they play a crucial role in the design of a realistic exercise. The representation of a Local Emergency Planning Committee (LEPC) is a good base for an exercise design team.

Once the team is established, the next step is to appoint or elect one member to be the team director. Exercise development is a complex task, therefore this person should be someone who can motivate people to continue working when things get difficult.

The team is responsible for coordinating exercise "play" activities (e.g., the type of exercise, response organization/s involved, etc.) between the multiple levels (i.e., State, county, and local) of emergency response organizations. This will help avoid fragmented or redundant decision making play and confusion which is particularly important if an exercise is conducted on the borderline of States, counties, or cities. The team is also responsible for writing the scenario. In order for the exercise to be successful, the players should not be included in writing the scenario, and the scenario should be kept confidential. Team members would also make ideal controllers or evaluators of an exercise. An exercise team should consider the types of participants to be involved in their exercise. A sample list of participants is included in Appendix E, and a list of potential exercise equipment needs is included in Appendix G.

There are two additional ingredients necessary for a successful exercise program. The first is to ensure that sound safety practices and principles are designed into the exercise to prevent injuries to players and the public (e.g., how will the public and bystanders be handled the day of the exercise). The second is to ensure that key elected and appointed officials support the exercise, particularly for multi-community exercises. The team and local officials can promote good-will and encourage mutual aid support by inviting neighboring officials to observe the exercise.

Exercise Scale Decisions

The team should select the right type of exercise based upon its experience, needs, and resources. A good strategy may be to start with a less ambitious exercise (tabletop or functional) and to build up to a full-scale exercise. This approach builds on exercise successes, boosts confidence, and gains management support. This "gradual" approach avoids the frustration of holding a full-scale exercise as an initial effort and having everything go wrong.

As with the exercise design team, get as many organizations as possible involved in the exercise. Encourage industry representatives to be involved from the beginning. When all parties are interested, the chances of getting industry commitment for a full-scale exercise are much greater. Consider combining efforts with another response organization or hold a county-wide exercise to test the ability of a response organization to request, receive, and utilize resources from other jurisdictions.

In addition to joining efforts with neighboring response organization(s) or counties, solicit exercise support from mutual aid groups. Use this group to share resources and identify people with training and exercise experience -- include them on the exercise design review team. Increase the complexity of the exercise commensurate with the number of participants.

Selection of Exercise Objectives

Regardless of the type of exercise (i.e., tabletop, functional, full-scale), objectives give an exercise focus. To assist in establishing exercise objectives, the team should conduct a needs assessment to identify areas that have not been previously tested or need improvement based upon previous exercises. Once the needs assessment is completed, the exercise objectives for each major participating response organization can be defined.

For example, FEMA has developed the **Hazardous Materials Exercise Evaluation Methodology (HM-EEM) and Manual** which consists of 15 major hazardous materials exercise objectives that are linked to specific emergency functions drawn from guidance contained in NRT-1. Each objective is specific, realistic, results-oriented, and measurable. Appendix A lists the 15 Hazardous Materials Exercise Evaluation Methodology Objectives. These objectives may be utilized in the design, conduct, and evaluation of a hazardous materials exercise.

In addition to Appendix A, Chapter V, Learning From the Experiences of Others, provides a summary of lessons learned from a large number of exercises conducted throughout the country in recent years. These lessons can be particularly useful in selecting additional exercise objectives, developing scenarios, and evaluating exercises.

Exercise Scenario Development

After selecting the exercise objectives, the next step is to develop an exercise scenario. An exercise scenario is a sequential, narrative account of a hypothetical accident. The scenario provides the catalyst for the exercise and is intended to introduce situations which will inspire responses, and thus allow testing of the exercise objectives. Most scenarios are initiated with an accident resulting in a release of, or the potential for a release of, a hazardous material. Sample scenarios and sequences of events for a tabletop and full-scale exercise are included in Appendix C and Appendix D.

For example, one scenario might entail an incident at a chemical manufacturing facility which results in the release of chlorine. The scenario would include a description of where, what, and when it occurred, the area

affected, weather conditions, etc. The scenario would also include clearly defined, preplanned times of the various stages of the accident; that is, what scenario events should occur to get agencies to carry out response actions.

These scenario events are often communicated via a control message. The control message describes the problems which prompt an agency to take action. One example of a preplanned control message may be that the chlorine valve can not be shut-off. The response action would be to utilize a "C Kit" and trained response personnel to stop the release until further repairs can be made to the valve. Another example of a preplanned control message may be that a train is scheduled to pick up some railcars at the chemical plant. The response action would be to notify the railroad and advise them not to come into the plant because of the accident.

The team might consider varying the exercise by using a transportation incident in lieu of a fixed facility incident. This type of incident involves many different facets of first response, such as identifying the chemicals involved from placards and/or shipping papers (manifests) and contacting the shipper and carrier for more information and support.

A realistic exercise scenario provides the best opportunity for a response organization to evaluate its emergency plan, training, and overall preparedness to operate under emergency conditions. There are several ways to incorporate realism into an exercise scenario.

One way to develop a realistic scenario is to evaluate real incidents and consider incorporating this real-world information into an exercise scenario. A great deal can be learned by reviewing case histories of incidents and accidents that have occurred across the country. For case history information, consider contacting the Environmental Protection Agency (EPA), the Association of American Railroads (AAR), and/or the Chemical Manufacturers Association (CMA). For further information, see Chapter VI, Tapping Additional Resources.

Another way to provide a realistic exercise scenario is to develop and use props and other simulation materials to the extent possible. Because of the lack of genuine physical cues (e.g., visible vapors or leaking liquids), it can be difficult to exercise field teams. Dry ice or smoke bombs are commonly used to simulate a hazardous material. Above all, think safety first when simulating hazardous materials.

Determine before the exercise whether field kits for environmental monitoring will be fully stocked for demonstration purposes or if only some of the more fragile equipment or expensive supplies will be simulated.

Use realistic weather conditions in the scenario, but not necessarily the actual weather on the day of the exercise. Simulated weather is usually best for driving the desired protective actions -- you can plan what areas will need to be "sheltered in-place" or "evacuated" in the exercise. Real weather is usually best only for testing weather instruments and communications with weather agencies.

Develop exercise scenarios that include moulaged victims that must be rescued and given medical attention. This type of scenario requires responders to instruct rescue vehicles (ambulance, helicopters) via radio, as to the nature and extent of the victim's injuries and whether it is necessary to change the route or landing site to avoid a hazardous chemical plume.

Design the exercise scenario so that requirements for protective actions are not predictable. One problem observed in some exercises is that scenarios virtually always progress to an evacuation of some area. When players are able to anticipate such a result, the exercise effectively limits the need to utilize the protective action decision making process. In hazardous materials incidents, especially where evacuation is sometimes the WRONG decision, the exercise scenario should not be predisposed to require or prompt an evacuation decision, but should leave open the option of sheltering in-place. Determine which protective actions will be demonstrated

and which will be simulated. Consider demonstrating parts of these actions during the exercise, perhaps by staffing some traffic control points or running some of the evacuation bus routes.

Design the scenario so that law enforcement personnel demonstrate the decision making process for traffic management strategies. The actual exercising of traffic control points is seldom required because it is a normal part of a police officer's job, but a representative number of traffic control points should be demonstrated to evaluate implementation times, communications capabilities, response personnel safety measures, and whether police officers are knowledgeable about their traffic (routing) and access control responsibilities (e.g., who may be admitted to an evacuated area).

Consider building in a communications failure into the exercise scenario so that the backup system is tested, not merely simulated or explained during the exercise.

Exercise Evaluation

The extent and depth of the evaluation is based on the participating response organization's needs and resources, plus any State and Federal technical assistance available. Controllers' evaluations and observations may suffice for many exercises, while additional assessment by trained evaluators may be needed for others.

One method of evaluation is to use related criteria or standards of performance. These standards of performance, agreed to before the exercise, are based upon observable response measures which must be performed to meet each objective. It is more useful for a response organization to receive an objective-based evaluation to know that a particular task was or was not performed and that it was or was not consistent with the plan, rather than a subjective judgment based solely upon an evaluator's opinion of "how well" an overall function was accomplished. Opinions are important, but they should be based upon specific observations and facts.

Another way of evaluating an exercise is to use evaluation techniques, such as FEMA's **Hazardous Materials Exercise Evaluation Methodology Evaluation (HM-EEM) and Manual**, described above. It can be beneficial to use the HM-EEM Manual in advance of the exercise to define the scope of each objective. In some cases, evaluators may require training on the exercise evaluation technique in advance of the exercise.

When possible, ensure that evaluators are trained, technically qualified to observe hazardous materials response activities, and experienced at evaluation of emergency response activities. Using qualified evaluators in technical areas (e.g., chemical characteristics, impacts) and/or evaluators experienced in evaluation can result in an objective and useful evaluation. If trained evaluators are not available locally, the response organization can gain its own evaluation experience by participating in a neighboring response organization's exercise, or by requesting help from State and/or Federal agencies. These agencies may be able to provide assistance in locating trained evaluators, providing evaluators, or training local evaluators.

Training and Exercising

Some extra training, shortly before the exercise, enhances a response organization's performance and is particularly useful for communities inexperienced in exercising. As a general rule-of-thumb, however, training should be conducted throughout the year, not just as a concentrated effort before the exercise.

Pre-exercise training might include communications training for all players involved in response activities so they can become familiar with equipment and proper protocol for exercises. This will help to eliminate a major problem experienced in many exercises.

The team should make arrangements to use a specifically identified radio channel on the day of the exercise. Begin and end each communication with "This is an exercise," because many people monitoring emergency radio channels may mistake the messages for a real incident. Everyone must know it is an exercise. Develop a fail safe mechanism or code (i.e., Code "red") to indicate when to immediately end an exercise for safety reasons or for a real emergency. Real emergencies take precedence over an exercise.

Final Preparations

Once a community has an emergency plan in place and the advance exercise planning activities are completed, the next steps are to fine tune the scenario, stage and set-up the site and equipment, and to finalize logistical and coordination aspects of the exercise.

For example, shortly before the exercise, the team should conduct an orientation seminar (often called a pre-exercise meeting) to inform players of last-minute changes, and to review roles, responsibilities, and objectives. Players are instructed on the extent of exercise "play" expected from them during the exercise -- what can and cannot be simulated. Often, in exercises, responders say "In an actual emergency I would have done this, but this is only an exercise." Make the exercise a worthwhile training experience by ensuring that all involved understand their roles.

The orientation seminar or pre-exercise meeting is a convenient time to distribute badges to all exercise personnel. These badges can be used to identify players, controllers, evaluators, and observers. The use of badges minimizes confusion about who may insert control messages, and identifies personnel to one another, maintaining the integrity of the exercise/evaluation process. Badges will work in only limited situations, however--primarily tabletop exercises. In functional and full-scale exercises, something readily visible and distinctive should be used (colored hats, t-shirts, etc.)

It is important to note that the amount of last minute activities will increase proportionately with the scope of the exercise. Thus, final preparations for a tabletop exercise will require less effort than those required for a full-scale exercise. Consequently, appropriate time and resources should be allowed to complete the critical last-minute, activities.

EXERCISE CONDUCT

Advance planning sets the stage for the smooth conduct of an exercise. A sample exercise planning checklist is located in Appendix F. It may be useful for the team director to refer to this before the exercise is initiated. The team director must assume responsibility for the conduct of the exercise to ensure that the exercise stays on track and thus, the agreed upon objectives are tested. The team director's job is to:

- Present the players with the exercise-initiating narrative.
- Announce the first event of the scenario.
- Stimulate player responses, without intervening in a way that assumes control of the play, unless it appears likely that the players will not initiate a response action critical to the objective(s) of the exercise.
- Manage the flow and pace of the exercise by introducing the remaining events in sequence through the use of control messages.

- Keep the exercise on schedule and terminate play at the specified end-time.

In general, it is best to let the exercise play develop naturally, with the players responding to the scenario events as they deem appropriate. Some response actions are so critical to the completion of the exercise objectives, however, that the exercise director and/or controllers may have to intervene in exercise play by interjecting additional response-stimulating messages in order to ensure that such responses occur. If intervention is necessary, it should be noted and discussed during the exercise evaluation.

POST-EXERCISE ACTIVITIES

There are numerous activities which should be conducted after an exercise. These activities include: the Evaluation Process, Exercise Feedback, and Follow-up.

Evaluation Process

Exercise evaluation is the systematic examination of the effectiveness of the emergency preparedness program. It provides decision makers with justification for improving the emergency plan or providing additional training.

Evaluation activities are ongoing throughout the exercise as evaluators record data and observations and make tentative judgments. One important post-exercise activity is a post-exercise debriefing in which facts and findings are presented, compared, and discussed by and among evaluators, players, and controllers, and conclusions are provided to exercise players. Tentative conclusions are generally provided shortly after the exercise and final conclusions are often provided later in a formal written report.

The exercise evaluation should address each exercise objective:

- Was the objective met?
- If yes, what were the results?
- If no, what changes are necessary to achieve the objective?

The most successful exercise is <u>not</u> one where all went well and participants walked away thinking "aren't we great?" Rather, the successful exercise <u>is</u> one that forces an honest look at capabilities and leads to improvement.

Exercise evaluation answers such important questions as:

- Are additional resources necessary?
- Are parts of the plan in need of revision?
- Is additional training required?
- Are staffing levels adequate?
- Is the communication system vulnerable to overload?

- Can first response units communicate with one another?

Exercise Feedback

In addition to exercise evaluation, other post-exercise activities may include having exercise players complete an evaluation questionnaire. This will produce information about the exercise, particularly the effectiveness of the plans and emergency response to the exercise scenario. Other post-exercise activities may include:

- Arranging for feedback mechanisms (e.g., participant debriefings, oral critiques, or a brief or comprehensive exercise evaluation report) to provide participants with an indication of opportunities for improvement in their plans and performance.

- Scheduling a follow-up exercise to test corrected deficiencies from previous exercises and to validate response under more complex situations and increased agency involvement.

- Arranging for newspaper accounts of the exercise to enlighten the public about the risk from hazardous materials and local efforts to respond to any incidents.

- Making concrete recommendations for resolving problems and improving procedures (additional practice, training, staffing, equipment). Re-plan, re-train, and re-exercise where objectives were not fully met.

Follow-up

Of particular importance is "following-up" on the exercise evaluation recommendations. Recommendations without follow-up would limit the response organizations from receiving the full benefit of the exercise. The follow-up is one of the most neglected areas of exercise development. Experts suggest the following techniques to ensure that follow-up occurs:

1. Use the exercise to establish goals for a long term preparedness program that includes exercises.

2. Assign tasks, a schedule, and the responsibility for recommended improvement.

3. Monitor the progress of implementing recommended improvements.

4. Test improvements during the next exercise.

Reconvene the original exercise design team following an exercise to determine what follow-up activity is necessary.

V. LEARNING FROM THE EXPERIENCES OF OTHERS

Over the past decades literally thousands of emergency exercises of varying scope have been conducted and evaluated by various communities and levels of government in order to test emergency plans. As a result of those exercises, such as those conducted under FEMA's Radiological Emergency Preparedness Program (REP), RRT/OSC exercises, actual hazardous materials incidents, and hazardous materials exercises and drills, many valuable lessons have been learned. This section utilizes many of the lessons learned from various exercises and provides a set of helpful hints for conducting effective hazardous materials exercises. Clearly, these lessons can transfer to hazardous materials exercises as well as plan development and review. For example, these lessons can be particularly useful in selecting exercise objectives, establishing requirements for demonstrating objectives, developing exercise scenarios, and evaluating exercises.

The helpful hints based upon these lessons learned are categorized according to their relation to the following specific response functions identified in NRT-1, **Hazardous Materials Emergency Planning Guide,** March 1987 (pages 37-38):

- *Initial Notification of Response Agencies*
- *Direction and Control*
- *Communications - Responder*
- *Warning Systems and Emergency Public Notification*
- *Public Information/Community Relations*
- *Resource Management*
- *Health and Medical Services*
- *Response Personnel Safety*
- *Personal Protection of Citizens*
- *Fire and Rescue*
- *Law Enforcement*
- *Ongoing Incident Assessment*
- *Human Services*
- *Public Works*
- *Others - Hazardous Materials Identification and Analysis*

Some of the activities suggested in the following helpful hints for exercises may require new plans or procedures to be developed, if they are not already in place, prior to the exercise. If so, all participates in the emergency response system should be fully briefed and instructed on new plans and procedures prior to the exercise. In addition, some of these suggestions are more likely to be used for a full-scale exercise than a tabletop or functional exercise.

INITIAL NOTIFICATION OF RESPONSE AGENCIES

- Verify the ability to detect and declare an emergency at the facility site or location of a transportation accident. This should be demonstrated by the hazardous materials facility management, transportation vehicle operator, and/or first arriving local responder(s) (e.g., police, fire).

- Contact the National Response Center (NRC) and the local emergency response organization (e.g., police or fire department dispatcher) in a timely manner once an emergency has been detected or declared. This contact can be made by the hazardous materials facility management, transportation vehicle operator, and/or local responder. Emergencies involving releases of reportable quantities of hazardous materials must, under federal law, be reported by the responsible party to the NRC.

- Notify each agency involved in the response effort. By making actual calls, a community can demonstrate that all required notifications can be made in a reasonable period of time. Simulating this may not give a true picture of the time needed to complete the initial notification. Give special attention to verifying the accuracy of listed phone numbers and to testing alternate numbers of contact points, even if the primary number is answered.

- Use pagers for notifying key, mobile personnel who are difficult to reach by phone.

- Use checklists to ensure that all necessary personnel are contacted.

DIRECTION AND CONTROL

- Establish a clear understanding of areas of responsibility for initial emergency response between the hazardous materials facility or transportation management and off-site officials. The facility, because of possibly greater resources and technical knowledge, may need to take some responsibility for off-site actions at the beginning of exercises and real events (e.g., field team monitoring of a toxic cloud).

- Implement the Incident Command System (ICS), which is now required under an Occupational Safety and Health Administration (OSHA) final rule (29 Code of Federal Regulations 1910.123[a][3]. An ICS is a combination of personnel, policies, procedures, and equipment working together within a common organizational structure with responsibility for management of assigned resources to effectively accomplish stated objectives at the scene of an accident. An ICS can be used to effectively manage minor incidents such as an automobile accident as well as major disasters. Experience has shown that an agency which uses ICS for day-to-day operations will be better prepared to handle major situations. For more information, contact the Occupational Safety and Health Administration, Division of Consumer Affairs, Room N-3647, 200 Constitution Avenue N.W., Washington, D.C. 20210, 202/523-8151.

- Ensure that the official designated in the local plan to take charge of an emergency response effort actually assumes control during the exercise. Don't short change the exercise by passing this responsibility off to a staff member. If the official must leave, only a specified alternate should perform the official's assigned tasks.

- Strive to get all agencies and organizations to participate. Exercise coordinators should put forth considerable effort to ensure that all critical agencies and organizations participate in exercise play. Nothing is more frustrating for local emergency response personnel than to have key representatives missing during an exercise.

- Incorporate 24-hour staffing and an actual shift change for key positions as part of an exercise. The area of direction and control is often the weakest with respect to 24-hour staffing. The primary (first shift) emergency response coordinator is usually quite competent, but the backup is less often capable of functioning without direct supervision or assistance.

- Do not activate the command posts or emergency operating center (EOC) ahead of the exercise. This pre-positioning can pose an obstacle in observing whether the EOC can be activated in a timely manner. An exception to this, of course, is when the community has a full-time, dedicated EOC available. Make sure all EOC staff have been trained in EOC operations.

COMMUNICATIONS - RESPONDER

- Utilize both primary and backup communications links during the exercise. Common communication problems observed during exercises include the number of different radio frequencies and the lack of a common channel for coordination of response efforts.

- Secure a commitment from the lead communications person at each facility to save copies of all communications-related documentation including message and radio logs. If such facilities do not currently use logs, adding them and procedures for their use should be considered. Such logs can be especially valuable in a later determination of where things went wrong during an exercise. Radio logs maintained by local agencies may contain sensitive information about actual agency business and may not be available for release. To overcome this potential problem, communications personnel need to keep a separate exercise communications log.

WARNING SYSTEMS AND EMERGENCY PUBLIC NOTIFICATION

- Schedule exercises to coincide with the routine test of public alerting systems. Such scheduling will minimize undue public concern (e.g., siren testing). If this is not possible, emergency response personnel should proceed with their normal procedure up to the point where the public alert system would actually be sounded. Evaluators will want to pay particular attention to the actual amount of time required to complete the activation process to determine if normal staffing can manage the activation process in addition to their day-to-day duties.

- Draft emergency broadcast system (EBS) messages as if they were to be read on the system. To determine whether the message is readable, ask participating radio stations to read all EBS messages associated with the exercise into a tape recorder in real-time according to the scenario. The tape can then be reviewed to verify validity of the message content that would actually have reached the public in the event of a real incident.

- Perform route alerting if it is intended to be the emergency warning system. To realistically assess the amount of time route alerting would take, read messages while driving slowly, knock on doors, and deliver the emergency instruction message. Responders should make a special point of identifying persons with special needs and simulate alerting them. Again, carefully review message content and clarity. If the area is largely non-English speaking, the message should be in both English and the dominant language of the area.

- Use existing emergency warning systems during hazardous materials exercises. If the area has an existing coastal storm warning or some other system, use that system, if possible, for hazardous materials incidents.

- Ensure that all announcements about on-site (e.g., at a chemical facility) protective measures include the information necessary for employees to implement them. This includes information on sheltering in-place as well as evacuation. Include information about wind direction, specific routes to follow to avoid the toxic cloud (plume), and specific assembly area.

- Use aspects of the warning system which are not routinely checked. Exercises should focus on aspects of the system unique to the emergency in the scenario (e.g., finding and using the right pre-scripted or pre-recorded messages, or writing and transmitting customized messages).

PUBLIC INFORMATION/COMMUNITY RELATIONS

- Treat media relations as realistically as possible during an exercise to adequately prepare for a real emergency. For example, actually set up a Joint Information Center (JIC) - a central location where actual media briefings and press conferences are held. A JIC helps eliminate the potential for conflicting news reports and helps control rumors. Provisions should be made to monitor TV and radio broadcasts to quickly correct erroneous information. Invite actual media representatives and other players primed to ask realistic, tough questions.

- Coordinate public information releases. This is particularly important given the large number of agencies involved and the relatively short time available for release. During an exercise, make sure all forms and releases are marked "This is an exercise."

- If the emergency plan calls for the use of a "citizen's information hotline," include the emergency telephone number in every news release, mention it at every news briefing, and display it prominently in the media room for television. This is one way to avoid rumors.

- Practice answering the "citizen's information hotline" with correct responses to inquiries. Calls from the media, insofar as possible, should be handled by the Public Information Officer (PIO) to ensure accurate information.

- Assign a full-time PIO to supervise the operators. This PIO supervisor should attend each news briefing to ensure up-to-date information is provided from the "hotline."

- Consider video-recording news conferences. This will be useful backup for post-exercise reference.

- Ensure that news releases and conferences are timely and accurately reflect information in the scenario as well as exercise events (protective action decisions, etc.).

- Ensure that news releases are clearly written. Do not expect the media to interpret highly technical information and then pass this information on to the public with a minimum of distortion.

- Explain and define terms and acronyms unique to emergency planning and response as well as terms related to different modes of transportation (e.g., piggyback, tankcar, boxcar, tanktruck etc.) and manufacturers or distributors of chemical products. Be careful to fully explain this terminology when it is used during briefings.

- Explain characteristics and hazards associated with the present emergency and the released materials. Use simple language easily understandable by the public.

- Make full use of the visual aids provided in the briefing area during the entire emergency exercise. This will enhance the briefing and result in a clear presentation.

- Provide to the media as soon as possible, accurate information about any injuries sustained by personnel at the incident and detailed accounts of the emergency response activities, reducing the likelihood of misunderstandings and inaccurate reporting.

- Use an effective leader to coordinate and integrate the information received by the spokespersons from each agency to ensure that accurate and comprehensive information is being released.

- Ensure that all sources of public information given out during the exercise are consistent with information previously distributed (e.g., information distributed via telephone books, hotel information cards, brochures, local media).

RESOURCE MANAGEMENT

- Confirm that all of the needed resources are actually available. It is often impractical and too costly in an exercise to mobilize all the actual resources that would be needed in a real emergency. So, when resources are needed, place actual calls to the providers of those resources; request the simulated provision and the actual numbers needed. Actually placing these calls provides emergency planners with an opportunity to verify that resource inventories are accurate and up to date.

- Keep logs of all requests, by both the requesters and providers, to verify that all needs are met, and that each provider actually has available the numbers of resources requested from him. This may involve MOUs with adjacent communities, counties, industry, and/or regional response organizations with facilities, equipment, and personnel having useful expertise.

HEALTH AND MEDICAL SERVICES

- Control the spread of contamination to ambulance and hospital staff when treating contaminated patients. Although written procedures may be in place, actual demonstration of these procedures during an exercise will point out if further training is needed or if procedures should be revised.

- Place actual telephone calls to the providers of health and medical services, even if only a small sample will be demonstrated during the exercise. These calls may be conducted out of sequence from the rest of the exercise, often in coordination with routine medical facility drills or exercises.

- Determine whether medical facilities know how to obtain and use necessary medical and other data for diagnosing and treating victims exposed to hazardous materials. Many local hospitals will not be able to treat such exposed victims without consultation with medical experts from other parts of the State or country.

- Ensure that contaminated victims are appropriately decontaminated in the field or at the medical facility as needed.

- Test procedures for providing hospitals with information on the number of victims, types of injuries and contamination involved, and estimated time of arrivals (ETAs) of emergency vehicles to allow adequate preparation by the hospitals. This information can be relayed from the emergency vehicle to the hospital.

- Utilize Poison Control Centers as another source of health hazard, diagnostic, and treatment information and as a dissemination point for information to the general public. Exercise design should test the ability of on-scene personnel to communicate with the Center and vice-versa.

- Consider testing use of color-coded triage tags (green - patient can wait; yellow -patient needs hospital attention, but, injury is not life threatening; red - patient needs immediate care, injury is life threatening; black - patient is beyond help or dead).

- Protect medical personnel from exposure to high concentrations of hazardous materials because of vaporization from contaminated clothing of victims in enclosed spaces such as ambulances or treatment rooms. For example, demonstrate providing personal protective equipment to medical personnel caring for victims in the ambulance. Medical personnel need to be familiar with and able to work in various levels of protection as needed. Consider the use of materials that are very odorous but safe to simulate actual hazardous materials.

RESPONSE PERSONNEL SAFETY

- In compliance with applicable OSHA regulations, it is the responsibility of employers to ensure that sound safety principles and practices are followed during the exercise to prevent injuries to participants. The Bibliography at the end of this report lists additional sources of safety information.

- Verify a working knowledge of the potential hazards of the hazardous material(s) involved in the simulated incident. Emergency responders frequently receive training on the proper use of their protective clothing, but may fail to demonstrate a working knowledge of the potential hazards they face.

- Question emergency responders about the type of protective clothing worn, its applicability to the chemical released in the exercise scenario, and any short- or long-term risks associated with exposure to that particular chemical.

- Issue protective equipment to each responder who needs it. Issuing the equipment will help verify that supplies are adequate and represent the time required to deploy responders into the "hot" zone.

- Simulate the use of personal protective equipment (PPE) to prevent the danger of evoking heat stress conditions in an exercise. At a minimum, try on the suits for fit, to test proper donning procedures, and to detect any defects in garments.

- Conduct personnel monitoring and decontamination activities as near as possible to the access control point and away from the incident site. If the area is located at a considerable distance from showers, demonstrate the use of a mobile washdown facility (e.g., tanker truck or hazardous materials response van with portable showers and eyewash capabilities).

- Institute a warning system for emergency evacuation of responders in the hazard zone. For example, SOPs might call for an emergency warning system (e.g., a 30-second blast from an air horn or electronic siren to signal operating teams to exit the hazard zone immediately) to be in place in case communication fails between command and the operating teams and a critical situation develops. Apparatus should be positioned so that the signal can be heard throughout the hazard area.

- Check the progress of response actions during the exercise. After implementing the best option, the response leader (e.g., Incident Commander) must be sure what is expected to happen is actually happening (or simulated as happening in the exercise scenario or controller messages). If not, he/she must review the real or simulated problem and select another option to lead to the desired objective.

- Monitor the use of field equipment and materials during the response. Ensure that adequate replacements and backups are available for portable air packs, washdown water (e.g., for portable

emergency showers and eyewash devices), electricity, neutralizers, sorbents, and expendable equipment.

PERSONAL PROTECTION OF CITIZENS

- Ensure that sound safety principles and practices are followed during the exercise to prevent injuries to the public. The Bibliography at the end of this report lists additional sources of safety information.

- Test the local emergency responder's ability to resolve problems that are likely to arise while protective actions are being implemented. For example, have people call the EOC and request special transportation assistance.

- Consider the time of day, season of the year, transient populations, and traffic conditions when discussing potential protective actions. Any decision made should be based upon incident assessment information rather than an ad hoc reason to act.

- Test the coordination between incident command personnel and school officials on any decisions to release students early or to evacuate the school. School evacuation has, for many communities, been an action that has come under intense scrutiny. As a result of this increased attention, officials may elect to evacuate the schools prior to a recommendation to do so. In hazardous materials incidents, such action may expose students to a greater risk than a decision to shelter in-place.

FIRE AND RESCUE

- Develop procedures to ensure a timely arrival at and entry into a fixed facility or scene of a transportation related incident by appropriate local emergency responders such as fire, police, and emergency medical services personnel.

- Challenge response personnel by having them demonstrate functions that are unique to hazardous materials incidents. Rather than engaging in routine functions, consider demonstrating: recognizing and identifying hazardous materials from shipping papers, identification numbers, labels, placards, and the shape and type of transport package (e.g., tankcar, cylinder, drum); victim decontamination; assessing injuries caused by a hazardous material and giving emergency medical treatment; using chemical sensing and neutralization equipment and materials.

- Require emergency responders to demonstrate proper procedures for decontamination of victims exposed to hazardous materials.

- Verify that emergency responders are able to communicate with other responders while wearing protective equipment; using a portable radio, headset, or cellular telephone.

- Test procedures and arrangements for necessary air supplies to ensure that air supplies can be augmented or recovered quickly during a lengthy incident.

LAW ENFORCEMENT

- Verify how protective equipment and supplies are provided to law enforcement personnel, as well as their effective use of these materials. Although state police are in charge of hazardous materials emergency responses in some states, local law enforcement personnel are often overlooked as emergency responders and need resources and training to enhance their response capabilities.

- Inform law enforcement personnel about the current incident status and recommended protective action. They have frequent contact with the public during hazardous materials incidents and are often asked for current information about the situation, protective action recommendations, and where the public might turn for more information (EBS stations, "hotline" numbers, etc.).

ONGOING INCIDENT ASSESSMENT

- Ensure adequate quantities of expendable field supplies such as portable air supplies, air or water sample containers, chemical monitoring equipment, etc. This precludes premature termination of monitoring or reduction in field capability.

- Provide for varying assignments of responsibility for incident assessment. For example, early in the exercise, a fixed facility simulating a hazardous materials emergency may demonstrate both on-site and off-site tracking of toxic cloud size, contents, and movement. Later, off-site activities will be taken over by local or State emergency responders. In a transportation exercise, the carrier may demonstrate initial assessment of the damage to a dented tank truck or railroad tankcar, and then call in experts for example, an inspector from the Bureau of Explosives of the Association of American Railroads.

- Confirm that field equipment (such as air sampling devices) is currently calibrated and certified as accurate. Establish procedures to assure this is done on a routine, periodic basis, and not just for the exercise.

- Confirm that designated team leaders are responsible for directing field team operations. Each team member should have clearly defined duties.

- Brief teams, prior to deployment, on the nature of the incident, the chemical(s) released, and meteorological information. Remind team members of team and individual duties as well as all safety procedures.

- Test procedures calling for instruments and communications to be checked prior to deployment. This precludes having to return to the site to replace the equipment once the team has deployed to the incident.

HUMAN SERVICES

- Make allowances for previous work commitments that may prevent full participation of volunteers in a exercise. All key positions must be filled by primary or alternate staff.

- Challenge agencies responsible for mass care by having them demonstrate their capability to provide health for citizens with special needs (e.g., people in wheelchairs).

PUBLIC WORKS

- Include public works personnel in an exercise. Generally, they are called upon to furnish equipment, materials, and personnel (e.g., for diking of spilled chemicals) to aid in mitigating a hazardous materials incident. While they are quite experienced in routine duties, they may lack the special training needed during hazardous materials incidents (e.g., protective equipment, hazard awareness). Many of the suggestions found under INITIAL NOTIFICATION OF RESPONSE AGENCIES, DIRECTION AND CONTROL, and WARNING SYSTEMS AND EMERGENCY PUBLIC NOTIFICATION response functions also apply, especially since Public Works is often not thought of as an "emergency response" agency.

HAZARDOUS MATERIALS IDENTIFICATION AND ANALYSIS

- Identify and determine the characteristics and risks of the hazardous materials(s) involved in the exercise. Once the hazardous material and its form (e.g., liquid, gas, or solid) is identified using a material safety data sheets (MSDS), shipping papers, waybills, identification numbers, labels, placards, and the shape and type of shipping package (e.g., tankcar, cylinder, drum), its risks should be studied and analyzed using emergency response guidebooks and other technical references. This skill is particularly important for transportation accidents, which are more unpredictable than incidents at fixed facilities which use the same hazardous materials. The U.S. Department of Transportation's "Emergency Response Guidebook" (1990) and the Association of American Railroads', "Emergency Handling of Hazardous Materials in Surface Transportation" (1989) and "Emergency Action Guides" (1984, with supplements up to and including 1990) are useful guidebooks for aiding first responders in identifying the hazardous material, analyzing its hazards, and establishing an effective course of action.

- Contact manufacturers of the hazardous material(s) involved and appropriate industry organizations and services for information and help in hazard identification and analysis. Contacting the manufacturer of the hazardous materials can provide the most useful information. Industry services such as the Chemical Manufacturers Association's Chemical Transportation Emergency Center (CHEMTREC) can also provide initial response and medical information and assistance in contacting the manufacturer, transporters, and shippers. The number for CHEMTREC is 1-800-424-9300.

- Demonstrate the use of CAMEO II or other computer tools to assess the situation and their use in managing the response.

VI. TAPPING ADDITIONAL RESOURCES

In preparing for a hazardous materials exercise, a response organization utilizes its own resources and may also look for resources that may be available through mutual aid agreements. Additionally, the response organization might consider tapping resources from the State government, Federal government, and the private sector.

State and Federal agencies have been conducting emergency exercises over the years as a prudent course of action for ensuring emergency preparedness to deal with catastrophic situations. Private sector companies are increasingly holding exercises at facility sites to test their response procedures and safety systems. As a result, a good deal of "outside" expertise may be available for supporting a local exercise. At the State level, the SERC would be an obvious point of contact. Other State agencies that may be of assistance include the State emergency management office, environmental health agency, and transportation agency.

A response organization can also access a variety of Federal resources and technical assistance to support its exercise. Resources include pre-scripted scenarios, a computer exercise generator that allows a scenario to be tailored to local circumstances, training courses that incorporate exercises, and written guidance on conducting exercises. Also available are specialists who can assist in exercise design and evaluation, videotapes, incident data that can be used to develop an exercise, and computer software for modeling chemical spills, plume movement, effectiveness of in-place sheltering, and movement of evacuation traffic. These models can be used for planning, developing exercise scenarios, helping to make protective action decisions, and measuring the effectiveness of protective actions. A number of Federal agencies in sponsoring their own exercises, actively encourage State and local participation.

Table 3 provides a summary of the resources available from Federal agencies. Following Table 3 is more detailed information on available Federal agency resources. Depending upon the type of resource required, local officials may contact a Federal agency directly or contact the Regional Response Team (RRT) which is composed of Federal agencies and State RRT representatives. The State RRT representative is the most direct conduit for obtaining RRT support. It is strongly recommended that a response organization seeking substantial Federal assistance and support coordinate any requests through the State. Many States have resources that could be used to complement or supplement Federal resources. Start by contacting the SERC, State agencies, and Federal Regional Offices.

TABLE 3: FEDERAL RESOURCES							
	AGENCY[a]						
	FEMA	EPA	USCG	DOT RSPA	DHHS ATSDR	DOC NOAA	DOD
RESOURCE							
Pre-scripted Scenarios	HR						
Computer Exercise Generator	HR						
Computer Resource Tools[b]	HR	HR	HR		HR	R	
Computer-Based Modeling	HR				H	R	
Exercise Training Courses	HR	HR					
Written Guidance	HR	HR					
Exercise Specialists/ Evaluators	HR	R	R		H		
Videotapes	HR	HR					
Incident Data	H			H			
Exercise Sponsorship	HR	R	R				H
HMIX[b]	HR	HR	HR	H			
H = Headquarters					R = Regional Offices or Districts		

[a]See list of acronyms on page 51.

[b]See discussions of appropriate Federal agency's resources listed below (i.e., CAMEO, IEMIS, CADET).

FEDERAL AGENCY RESOURCES

National Response System

The National Response System was created under the authority of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) which required the development of the National Oil and Hazardous Substances Pollution Contingency Plan (commonly known as the National Contingency Plan or NCP). The purpose of the plan is to provide the Federal organizational structure and procedures for preparing for and responding to discharges of oil and releases of hazardous substances. The plan establishes three organizational levels: the National Response Team (NRT), Regional Response Teams (RRTs), and On-Scene Coordinators (OSCs).

NRT - A national planning, policy, and coordinating body consisting of 14 Federal agencies with interests and expertise in emergency response to oil discharges and hazardous substance releases.

RRTs - Regional planning, policy, and coordinating bodies located in the ten Federal regions, the Caribbean, Pacific Oceania, and Alaska. RRT membership parallels NRT membership with the addition of a representative from each State in the region. Neither the NRT nor the RRTs respond directly to incidents although they provide technical advice to an OSC and have access to resources (e.g., equipment) during an incident. Three Joint Response Teams have also been established to promote international planning and coordination along our borders with Canada, Mexico, and the USSR.

OSC - A Federal official predesignated by the Environmental Protection Agency for inland areas and the U.S. Coast Guard for coastal areas. The OSC coordinates all Federal containment, removal, and disposal efforts and resources during an incident. Other Federal agencies, such as the Department of Defense and Department of Energy, also have designated OSCs for dealing with any releases from their facilities.

Through the National Response Team and Regional Response Teams (RRT), Federal agencies are working to combine their exercise resources, to share information, to broaden exercises to include hazardous materials scenarios, and to expand exercise involvement to include all interdisciplinary elements. Each RRT is co-chaired by the Environmental Protection Agency (EPA) and the United States Coast Guard (USCG). To contact the RRT Co-Chairs, utilize the FEMA-DOT Hazardous Materials Information Exchange (HMIX) for an up-to-date list of names, addresses, and telephone numbers.

The NRT, RRTs, and OSCs, together with the National Response Center (NRC), form the National Response System, which is responsible for the overall coordination of Federal activities related to oil discharges and hazardous materials releases. The National Response Center, a central point for receiving incident notifications and collecting incident information, provides technical data to support OSCs in response during an incident.

The National Contingency Plan also establishes requirements for Federal regional and OSC contingency plans. A regional contingency plan must be developed by each RRT as a means for coordinating timely, effective responses by Federal agencies and other organizations to oil discharges and hazardous substance releases. An OSC contingency plan may be developed for responses in each OSC's area of responsibility. OSC contingency plans should be compatible with all appropriate response plans of State, local, and other non-Federal entities.

- **National Response Center**

  Toll-free telephone number for reporting oil and hazardous substance releases:

  1-800-424-8802

FEDERAL EMERGENCY MANAGEMENT AGENCY

The Federal Emergency Management Agency (FEMA) provides a number of resources to assist State and local officials in designing, conducting, and evaluating emergency exercises.

Regional Offices

FEMA Regional Office Hazardous Materials Program Staff members are available, as time permits, to assist State and local governments in all aspects of planning, conducting, and evaluating exercises. Moreover, an **Exercise Specialist** in each FEMA Regional Office serves as a focal point for scenario development, pre-exercise training, and post-exercise evaluation.

FEMA also supports a **State Training Officer** and an **Exercise Training Officer** (ETO) in almost all State Emergency Management Offices. The ETOs are available to aid local communities by furnishing materials, planning exercises, conducting pre-exercise training, evaluating exercises and preparing after-action reports. Exercise Training Officers meet once a year at FEMA's National Emergency Training Center in Emmitsburg, MD, to discuss exercise issues. The Exercise Training Officers are usually responsible for coordinating the State and Local Exercise Annex (SLE) required under FEMA's CCA.

Comprehensive Cooperative Agreements (CCA)

FEMA's CCA provides State governments with a single vehicle for applying for and receiving financial and technical assistance available under FEMA's grant programs. Under the CCA, participating State and local jurisdictions receiving FEMA funding are required under the SLE Annex to develop/update a 4-year exercise plan for validating emergency preparedness and response capabilities. As part of this plan, one full-scale exercise must be conducted during the 4-year period and at least a functional exercise is to be undertaken in each of the remaining 3 years. (FEMA may even give credit for an actual major emergency and/or disaster in lieu of a functional or full-scale exercise.)

Exercises must be rotated each year among three primary scenarios -- National Security (NS), Natural Hazard (NH), and Technological Hazard (TH). Hazardous materials exercises may be accredited as meeting the Technological Hazard exercise required by the SLE Annex in the CCA. States are responsible for seeing that roughly 1/3 of the local communities use one of the three primary scenario types each year. The aim is to allow a community to exercise all emergency functions (e.g., direction and control, fire and rescue) related to its major hazards over a reasonable period of time.

As a result of this 4-year exercise requirement, States are required to submit annually an exercise schedule for each local community indicating the proposed major scenario event, the exercise type, and the quarter for each exercise during the year. After an exercise has been completed, FEMA Form 95-16, Exercise Data is used for documenting the purpose of the exercise, hazard scenario, agencies represented, functions tested, problems encountered, etc. A computer-generated program is available to States to input FEMA Form 95-16 and generate various reports. (A copy of the form appears in Appendix B.) In FY 1989, over 1,300 local exercises included hazardous materials as the primary incident or as a secondary impact according to the data base.

If a hazardous materials exercise is not included in the 4-year plan for a given year as the major scenario event, and there is a desire to conduct a hazardous materials exercise, consideration should be given to incorporating a hazardous materials consequence as a secondary impact in an already scheduled exercise (e.g., flood, earthquake, national security). A community opting to do this could thus meet the requirements of FEMA's CCA and at the same time satisfy any expectations for exercising plans developed under SARA Title III.

Training Resources

FEMA also offers a 4-1/2 day Exercise Design Train-the-Trainer course to qualify instructors to conduct the course in the field. Trainers are given an orientation on educational philosophy; exercise design and methodology; and effective use of the instructor guide, student manual, and other resource materials. The 3-day field version of the course provides knowledge and develops skills that will enable the students to train a staff and to conduct an exercise that will test a community's plan and operational response capability. Through the Exercise Design Train-the-Trainer course and other courses, FEMA delivers some 12-14 classroom exercises each year.

FEMA also offers a training course, "Radiological Emergency Preparedness Exercise Evaluation," for evaluating commercial nuclear power plant offsite exercises. Since many aspects of REP planning and exercises are applicable to hazardous materials, attendance at this course has some practical utility for hazardous materials planners. Additionally, FEMA holds periodic earthquake and national security exercises which involve State/local participation and may include hazardous materials as a secondary scenario.

The Emergency Education Network (EENET) is FEMA's one-way video, two-way audio, satellite-distributed system that beams live programs on emergency management subjects, such as exercising, across the country. EENET provides live, interactive training and education to approximately 68,000 emergency managers and a secondary audience of over 100,000 people.

Computer Resources

FEMA and the Department of Transportation jointly manage the **Hazardous Materials Information Exchange (HMIX)** which provides up-to-date information on Federal hazardous materials training courses (including courses dealing with exercises), regional public and private sector hazardous materials activities, upcoming events and meetings, recent legislation and regulations, and organizational resources. Information can be accessed through a personal computer having communications capability or a terminal and modem by dialing (708) 972-3275. An information systems technician is available to provide assistance Monday through Friday, 8:30 A.M. to 5:00 P.M., Central Time on the toll free line, 1-800-PLANFOR (752-6367); Illinois residents may dial 1-800-367-9592. A toll free line also provides access to HMIX 24-Hours a day, 7 days a week at 1-800-874-2884.

FEMA's National Emergency Training Center has a library of fully tested exercise scenarios for a broad range of disasters including hazardous materials. These scenarios may be modified to meet the special needs of a community. A computerized exercise training design package known as CADET, Computer Aided Design for Exercise Training, is also available through FEMA Regional Offices. The computer software, consisting of 16 floppy discs, is designed to run on IBM-compatible personal computers. The user selects exercise objectives and then customizes the program by providing specific names for rosters, places, etc. The computer generates the complete scenario including events, printed messages, and evaluation forms.

ARCHIE, the Automated Resource for Chemical Hazard Incident Evaluation, is a computerized consequence analysis tool for the DOT/EPA/FEMA developed Handbook of Chemical Hazard Analysis Procedures. The ARCHIE can be used to generate realistic hazard scenarios based upon hazard data inputted by the user. This tool and companion handbook is available from the three producing agencies.

FEMA has developed the Integrated Emergency Management Information System (IEMIS), a general-purpose, computer-assisted system which can be directly applied to hazardous materials incidents including support of exercises and real-time responses. Chemical spills, plume movement, in-place sheltering, and traffic movement can be simulated under varying weather conditions. The resulting technical information can be used for planning, developing exercise scenarios, helping to make protective action decisions, and measuring the effectiveness of protective actions.

FEMA's Capability and Hazard Identification Program (CHIP) is a nationwide data base that includes over 3,800 State and local jurisdictions. Data are available on local hazards, local capability to deal with those hazards, and plans for addressing capability shortfalls. The CHIP data can be used to identify areas of weakness that might be tested in an exercise and/or be used for determining exercise objectives.

Exercise Programs

As an element of its Hazardous Materials Program, FEMA has developed the **Hazardous Materials Exercise Evaluation Methodology (HM-EEM) and Manual** as a part of its technical assistance to State and local governments. The document, developed in response to the need for a standardized and objective-based exercise evaluation tool, is intended for use by State and local governments in evaluating hazardous materials exercises conducted to validate emergency plans and identify opportunities to improve preparedness. The HM-EEM is a series of modules prepared to evaluate 15 major exercise objectives (see Appendix A) covered by response plans prepared using the guidance contained in NRT-1 and CPG 1-8. The HM-EEM may be subdivided into modules using a matrix that links the objectives to specific emergency functions or locations. A companion HM-EEM Manual defines the exercise objectives and provides additional detailed information on each objective to aid in hazardous materials exercise evaluation. Additionally, a blank timeline is contained within the document to facilitate in the reconstruction of significant exercise events.

Under its Radiological Emergency Preparedness (REP) Program, FEMA provides technical assistance to State and local governments for offsite radiological emergency planning and exercising around commercial nuclear power plants. Currently, 71 nuclear power plant sites are operational in the U.S. involving some 441 local communities in offsite preparedness within the 10 mile emergency planning zone. States and local governments are required to participate in a joint exercise with a commercial nuclear power plant once every two years. Federal evaluation of these exercises identifies strengths and inadequacies which the States and local governments are asked to correct. This process of periodic exercises and corrective actions is a key to the high level of emergency preparedness around commercial nuclear power plants which has led many officials to conclude that communities near a nuclear power plant are among the best prepared to cope with any type of emergency.

For information on these or other resources FEMA has to offer, contact your FEMA Regional Office.

- **Federal Emergency Management Agency**
  Hazardous Materials Branch
  State and Local Programs and Support Directorate
  500 C Street, S.W.
  Washington, D.C. 20472
  202/646-2860
  FTS/876-2860

- **Federal Emergency Management Agency**
  National Emergency Training Center
  16825 South Seton Avenue
  Emmitsburg, MD 21727
  301/447-1000
  FTS/652-1000

- **HAZARDOUS MATERIALS INFORMATION EXCHANGE (HMIX)**
  Electronic Bulletin Board: 708/972-3275 or FTS/972-3275
  Toll-Free Access Number: 1-800-874-2884

  Toll-Free Assistance Number: 1-800-PLANFOR(1-800-752-6367)
  (In Illinois: 1-800-367-9592)

FEDERAL EMERGENCY MANAGEMENT AGENCY
REGIONAL OFFICES

REGION I
FEMA
Room 462
J.W. McCormack Post Office
& Courthouse Building
Boston, MA 02109-4595
617/223-4412
FTS/223-4412

REGION II
FEMA
Room 1351
26 Federal Plaza
New York, NY 10278
212/238-8225
FTS/649-8225

REGION III
FEMA
Second Floor,
Liberty Square Building
105 South Seventh St.
Philadelphia, PA 19106
215/931-5528
FTS/489-5528

REGION IV
FEMA
Suite 700
1371 Peachtree St. N.E.
Atlanta, GA 30309
404/853-4454
FTS/230-4454

REGION V
FEMA
Fourth Floor
175 West Jackson Blvd.
Chicago, IL 60604-2698
312/408-5524
FTS/363-5524

REGION VI
FEMA
Federal Regional Center
800 North Loop 288
Denton, TX 76201-3698
817/898-9137
FTS/749-9137

REGION VII
FEMA
Room 200
911 Walnut St.
Kansas City, MO 64106
816/283-7011
FTS/759-7011

REGION VIII
FEMA
Denver Federal Center
Building 710, Box 25267
Denver, CO 80225-0267
303/235-4923
FTS/322-4923

REGION IX
FEMA
Building 105
Presidio of San Francisco, CA 94129
415/923-7187
FTS/469-7187

REGION X
FEMA
Federal Regional Center
130 228th St., S.W.
Bothell, WA 98021-9796
206/487-4696
FTS/390-4696

ENVIRONMENTAL PROTECTION AGENCY

The Environmental Protection Agency (EPA) offers a range of resources and assistance for hazardous materials exercises. EPA Regional Offices play an integral part in working with State and local officials to ensure effective exercises are conducted. If a State or local community intends to exercise a SARA Title III plan, the Regional Office Chemical Emergency Preparedness and Prevention (CEPP) Coordinators are available to provide assistance and advice. Two sources of direct technical assistance in conducting exercises include the Environmental Response Team (ERT) and contractor support, particularly from the EPA Technical Assistance Teams (TATs).

EPA's Environmental Response Team (ERT), located in Cincinnati, OH and Edison, NJ, is a group of highly trained scientists and engineers having expertise in multimedia sampling and analysis, hazard evaluation, environmental assessment, and clean-up techniques. The ERT offers assistance in conducting full-field exercises, coordinating the effort with EPA Regional Offices. The ERT works with a community to design a scenario relevant to the local situation and serves as a facilitator in carrying out the exercise. A debriefing is held on the day following an exercise which allows participants to evaluate their roles and to identify areas and gaps in planning activities and response capabilities which need to be addressed. The ERT, which is available to provide overall technical support to On-Scene Coordinators (OSCs) in actual incidents, conducts approximately ten full-field exercises a year.

EPA offers a number of training courses in safety and technical operations related to hazardous materials responses. Known as the "165 Series," these courses cover topics such as response safety decision making, air surveillance for hazardous materials, sampling, hazard evaluation and environmental risk assessment, and incident mitigation and treatment methods. Three courses in the 165 series include response exercises as part of the course content: Personnel Protection and Safety (165.2), Hazardous Materials Incident Response Operations (165.5), and Hazardous Materials Response for First Responders (165.15). These exercises provide students the opportunity to apply and test the lessons learned during the course in a "hands-on" mode, such as using monitoring and sampling equipment to assess impacts of incidents and determining level of protective clothing needed to respond safely.

EPA maintains a tape library which includes "The Day Before," a tape developed by EPA Region VII on steps to consider in developing an exercise, and videos of previous ERT exercises.

On a bilateral level, EPA is leading efforts of the Joint Response Team in working with Mexico and Canada to include exercises as part of joint preparedness activities. Mexican officials participate in exercises along the U.S.-Mexican border. As a product of these cooperative efforts, a modified table-top exercise has been recently developed by Mexico and EPA Region IX. This type of exercise, which is called "written notification exercise," is especially pertinent in those communities just beginning an involvement in hazmat planning and response and to those with limited resources for exercising. The exercise is conducted in a low-profile, structured, but non-confrontational manner.

The Computer-Aided Management of Emergency Operations (CAMEO) system, jointly developed by EPA and National Oceanic and Atmospheric Administration (NOAA), is being used in all types of exercises to provide information on chemical properties, wind directions, other meteorological information, plume movement, populations centers at risk, and other significant information required in an actual event. (See Department of Commerce/NOAA section of this chapter for a detailed description of the CAMEO program.)

EPA fully supports interagency exercises and believes that better use can be made of the limited resources available to all parties which recognize the value of exercises as part of their preparedness efforts. Appendix C and Appendix D include "hands-on" information on scenarios and sequences of events which may be useful in planning and conducting table-top and full-scale exercises. Appendix E contains a sample list of

exercise participants. Appendix F contains a sample exercise planning checklist, and Appendix G includes a list of potential exercise equipment needs.

- **Environmental Protection Agency**
  Chemical Emergency Preparedness and Prevention Office
  Office of Solid Waste and Emergency Response
  401 M Street, S.W.
  Washington, D.C. 20460

  202/475-8600

- **Environmental Protection Agency**
  Emergency Response Team
  26 West St. Clair Street
  Cincinnati, OH 45268

  513/569-7537
  FTS/684-7537

- **Environmental Protection Agency**
  Emergency Response Team
  Woodbridge Ave.
  Edison, NJ 08837

  201/321-6740
  FTS/340-6740

- **Environmental Protection Agency**
  Emergency Planning and Community Right-to-Know
  Information Hotline

  1-800-535-0202
  1-202-479-2449 in Washington, D.C.

ENVIRONMENTAL PROTECTION AGENCY
AGENCY REGIONAL OFFICES

REGION I
EPA
New England Regional
Laboratory
60 Westview St.
Lexington, MA 02173
617/860-4300
FTS/860-4300, ext. 221

REGION II
EPA
Woodbridge Ave.
Edison, NJ 08837
201/321-6656
FTS/321-6656

REGION III
EPA
841 Chestnut St.
Philadelphia, PA 19107
215/597-0922
FTS/597-0922

REGION IV
EPA
345 Courtland St., N.E.
Atlanta, GA 30365
FTS/257-3931

REGION V
EPA
230 S. Dearborn St.
Chicago, IL 60604
312/886-1964
FTS/886-1964

REGION VI
EPA
Allied Bank Tower
1445 Ross Ave
Dallas, TX 75202-2733
214/655-2270
FTS/255-2270 or 2277

REGION VII
EPA
726 Minnesota Avenue
Kansas City, KS 66101
913/236-2806
FTS/757-2806

REGION VIII
EPA
One Denver Place
Suite 1300 999-18th St.
Denver, CO 80202-2413
303/293-1723
FTS/564-1723

REGION IX
EPA, H-12
75 Hawthorne Street.
San Francisco, CA 94105
415/744-2100
FTS/484-2100

REGION X
EPA
1200 6th Avenue
Seattle, WA 98101
206/442-1263
FTS/399-4349

U.S. COAST GUARD

The U.S. Coast Guard (USCG) sponsors, with RRT support, six On-Scene Coordinator/Regional Response Team (OSC/RRT) exercise simulation training sessions across the country on an annual basis. Five of these exercises involve coastal areas; the sixth focuses on an inland incident.

OCS/RRT exercises are comprehensive and realistic simulations of hazardous materials or oil incidents used to evaluate plans, policies, procedures, and personnel. The focus of the exercise is on the OSC/RRT relationship and the management of a major incident. Over 150 Federal, State, local, and industry officials generally participate in a typical exercise. Participation in the exercise provides the opportunity for Federal predesignated OSCs and RRT members to assemble in a central location with the local response community. Industry response representatives and clean-up contractors are also involved. All actions are simulated; no equipment or personnel are dispatched.

The goal of the exercise is to allow all elements of the response community to work together. The scenario is designed to reflect actual patterns in the host community. The Coast Guard Marine Safety School at Yorktown, VA designs the scenarios in coordination with a selected team of local agency and industry representatives. Generally, each simulation involves a 6-week process from initial planning through scenario development and exercise conclusion. Exercise length is two days -- eight hours of simulation activity conducted in real time and three hours of open forum debriefing. The debriefing is a means to discuss any deficiencies and necessary corrective actions as well as to reinforce positive results. Communities interested in participating in a simulation should contact the RRT or the local predesignated Federal OSC.

- **U.S. Coast Guard**
  Marine Environmental Response Office (T-MER)
  Marine Safety School
  Reserve Training Center
  Yorktown, VA 23690
  FTS/827-2335

DEPARTMENT OF TRANSPORTATION

The Department of Transportation/Research and Special Programs Administration (DOT/RSPA) has a variety of program resources and technical assistance which can support the development of comprehensive hazardous materials exercises, with particular emphasis on transportation issues.

RSPA's primary source of hazardous materials transportation data, the Hazardous Materials Information System (HMIS), can be used to identify either individual incident reports or compilations of State incident history. The actual performance data derived from reports by carriers whenever there is an unintentional release of hazardous materials can be a useful source of scenario material. Individual incident information includes types of vehicles and materials involved, deaths and injuries, if any, resulting from the incident, losses and property damage, estimated cost of decontamination, and nature of packaging failure. New emphasis has been placed on enhancing HMIS use; RSPA encourages requests for data.

Information emanating from enforcement activity can be used both in determining objectives for exercises and in setting up scenarios based on identified patterns of chemicals being shipped on major

transportation routes. DOT is encouraging State and local communities to collect traffic flow information in order to allocate resources and plan emergency response efforts. As information about frequent violations becomes available, planners will have an additional resource for refining their hazard analysis.

As part of the cooperative training initiatives under the auspices of the National Response Team Training Committee, RSPA has established a curriculum exchange effort to identify State-developed training materials, case studies, and exercise scenarios which can be utilized as resource materials. These materials will be collected and indexed for information sharing.

As a result of increased communication among local, State, Federal agencies, and industry efforts like the Community Awareness and Emergency Response (CAER) program, considerable information is being informally shared about exercise plans. DOT is increasing efforts to load this information on the FEMA-DOT Hazardous Materials Information Exchange (HMIX).

ARCHIE, the Automated Resource for Chemical Hazard Incident Evaluation, is a computerized consequence analysis tool for the DOT/EPA/FEMA developed Handbook of Chemical Hazard Analysis Procedures. The ARCHIE can be used to generate realistic hazard scenarios based upon hazard data inputted by the user. This tool and companion handbook is available from the three producing agencies.

New DOT guidelines can be used to assist State officials in evaluating alternative routing approaches which can be tested in exercises. An additional planned resource is RSPA analyses of major transportation incidents. Site visits are planned to document what lessons can be learned for planning and emergency response activities.

Another well-established resource to emergency responders is the DOT Emergency Response Guidebook. It is a guide for initial action to be taken when handling incidents involving hazardous materials. It covers over two thousand chemicals and includes potential hazards, emergency actions, and initial isolation/evacuation distances for selected hazardous materials. The information on protective action and isolation distances can be utilized for exercises.

- **Department of Transportation**
  Research and Special Programs Administration
  Federal, State, and Private Sector Initiatives Div.
  400 7th Street, S.W.
  Washington, D.C. 20590

  202/366-4900

DEPARTMENT OF HEALTH AND HUMAN SERVICES

Under the provisions of CERCLA, the Agency for Toxic Substances and Disease Registry (ASTDR) in the Department of Health and Human Services (DHHS) is responsible for providing support to State and local governments in health matters relating to releases or potential releases of hazardous materials. ATSDR can furnish technical support to Federal, State, and local agencies in planning hazardous materials exercises, and in testing and evaluating the health components of their emergency plans. ATSDR has participated in developing, staging, and evaluating both tabletop and full-scale exercises. Depending on the extent of the exercise, ATSDR

input will address contamination reduction and decontamination activities related to response personnel, emergency medical services, and hospital emergency rooms. Exercises requiring decision making related to overall public health are also encouraged.

- Department of Health and Human Resources
  U. S. Public Health Service
  Agency for Toxic Substances and Disease Registry
  600 Clifton Road (Mailstop E-28)
  Atlanta, GA 30333

  24-Hour Number: 404/639-0615
  FTS/236-0615

DEPARTMENT OF COMMERCE

The National Oceanic and Atmospheric Administration (NOAA) of the Department of Commerce (DOC) currently makes available operational models for spill responses (spill trajectory and air dispersion) which can be used in exercises. For example, the Computer-Aided Management of Emergency Operations (CAMEO) system, developed by NOAA in cooperation with the fire department of Seattle, WA, is receiving increasing use by local emergency management organizations. The CAMEO system is a program jointly managed by NOAA and EPA. CAMEO is distributed by the Environmental Health Center of the National Safety Council in Washington, D.C.

CAMEO is designed to help emergency planners and first responders both plan for, and safely handle, chemical accidents. CAMEO contains response information and recommendations for 2,629 commonly transported chemicals; an air dispersion model to assist in evaluating release scenarios and evaluation options; and several easily adaptable databases, and a computational program that addresses the emergency planning provisions of Title III, the Emergency Planning and Community Right-to-Know Act of 1986. CAMEO can be used for tabletop exercises and simulations and for hazards analysis training.

CAMEO can include such diverse information as facility floor plans with chemical storage locations; contacts lists; locations of schools, hospitals, and other population concentrations; response resources; and maps of the planning area, overlaid with plumes calculated by the air model.

CAMEO operates in Macintosh and MS-DOS (IBM-compatible) computers; both computers programs are functionally equivalent.

- **Department of Commerce**
  National Oceanic and Atmospheric Administration
  Hazardous Materials Response Branch
  7600 Sand Point Way, N.E.
  Seattle, WA 98115

  206/526-6317
  FTS/392-6317

DEPARTMENT OF DEFENSE

Each military service in the Department of Defense (DOD) has well-established programs for routine testing of emergency response plans.

The U.S. Army Material Command Surety Field Activity, for example, is responsible for providing technical supervision of the Army Material Command's chemical surety, nuclear, and nuclear reactor facility accident/incident response and assistance activities, including exercising of the Army Service Response Force. Army installations/organizations that have the mission of storing, handling, or using military hazardous materials are required to develop contingency or operation response and assistance plans. Additionally, they are required to conduct quarterly exercises. One of these exercises should involve testing existing State, local, or other supporting agency plans on an annual basis.

Every two years, the Army through the Army Material Command conducts an Army-wide training exercise to test and improve the Army's capability to respond to an incident involving chemical surety materials. The first of these exercises included FEMA and EPA as participants. As a result of this exercise, it was recommended that offsite response considerations be extended to include greater participation from State and local government representatives and to focus greater attention on the needs of evacuated civilians. The exercise also emphasized the need for clarification of OSC designation during an incident at a defense facility.

- **Department of the Army**
  U.S. Army Material Command
  Surety Field Activity
  Picatinny Arsenal, NJ 07806-5000

  201/724-4836

PRIVATE SECTOR RESOURCES

In addition to State and Federal agency support, the private sector can provide numerous resources (e.g., technical assistance, planning capabilities, equipment). Industry resources, when combined with local, State, and perhaps Federal resources and assistance, can improve overall emergency preparedness, promote public safety, and provide for a multi-disciplinary approach to a comprehensive exercise program.

The Community Awareness and Emergency Response (CAER) program initiated by the Chemical Manufacturers Association (CMA) is one example of available private industry resources. This program encourages chemical plant managers to take the initiative in cooperating with local communities to develop integrated emergency plans for responding to hazardous materials incidents.

Another example is the TRANSCAER program which is jointly sponsored by CMA and numerous trade associations such as the Association of American Railroads (AAR), National Association of Chemical Distributors (NACD), National Tank Truck Carriers (NTTC), American Petroleum Institute (API), and the American Waterways Operators (AWO), to name a few. While CAER is focused in communities where chemical facilities operate, its sister program, TRANSCAER, has begun in towns where hazardous materials are transported - via air, rail, highway, water, and/or pipeline. It is a three-way communications effort among industry, transporters, and the public to increase community awareness and improve emergency preparedness -- especially in communities where hazardous materials are transported.

On another front, the Joint Commission on Accreditation of Healthcare Organizations (JCAHO) has issued standards for Plant, Technology, and Safety Management that hospitals and other healthcare organizations must meet in order to receive and maintain accreditation. These standards require healthcare organizations to develop an emergency preparedness program designed to manage the consequences of natural disasters or other emergency situations that might disrupt an organization's ability to provide health care and treatment.

The JCAHO standards require healthcare organizations to demonstrate semiannually how they would implement their emergency preparedness program -- either in response to an actual incident or through a planned drill. Communities may want to consider coordinating their hazardous materials exercises with local hospital drills.

With the increased awareness of chemicals in the environment supported by recent legislation, numerous quality training programs and computer software applications for data storage and emergency response modeling are readily available. While all these resources will not be discussed in detail in this handbook, be aware that additional resources are available which may enhance a comprehensive exercise program.

PRIVATE SECTOR RESOURCES

- **Association of American Railroads**
  Bureau of Explosives
  50 F St. N.W.
  Washington, D.C. 20001
  202/639-2133

- **Chemical Manufacturers Association**
  2501 M St. N.W.
  Washington, D.C. 20037
  202/887-1100

- **Joint Commission on Accreditation of Healthcare Organizations**
  875 North Michigan Avenue
  Chicago, IL 60611
  312/642-6061

To contact **Federal Agency and Private Sector** sources of exercise assistance, utilize the FEMA-DOT Hazardous Materials Information Exchange (HMIX) at (708) 972-3275 or 1-800-874-2884. The HMIX computer bulletin board contains an up-to-date list of names, addresses, and telephone numbers as well as other resources to tap prior to an exercise. The HMIX is one of the best ways to stay abreast of available exercise resources.

ABBREVIATIONS/ACRONYMS

AAR	Association of American Railroads
API	American Petroleum Institute
ARCHIE	Automated Resource for Chemical Hazard Incident Evaluation
ATSDR	Agency for Toxic Substances and Disease Registry
AWO	American Waterway Operators
CADET	Computer Aided Design for Exercise Training
CAER	Community Awareness and Emergency Response
CAMEO	Computer-Aided Management of Emergency Operations
CCA	Comprehensive Cooperative Agreement
CEPP	Chemical Emergency Preparedness and Prevention
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act of 1980
CHEMTREC	Chemical Transportation Emergency Center
CHIP	Capability and Hazard Identification Program
CMA	Chemical Manufacturers Association
CPG 1-8	Civil Preparedness Guide 1-8, "Guide for Development of State and Local Emergency Operations Plans," Federal Emergency Management Agency, October 1985
DOC	Department of Commerce
DOD	Department of Defense
DHHS	Department of Health and Human Services
DOT	Department of Transportation
EBS	Emergency Broadcast System
EMS	Emergency Medical Service
EOC	Emergency Operating Center
EOP	Emergency Operations Plan
EOS	Emergency Operations Simulation
EPA	Environmental Protection Agency
ERT	Environmental Response Team
ETA	Estimated Time of Arrival
ETO	Exercise Training Officer
FE	Functional Exercise
FEMA	Federal Emergency Management Agency
FSE	Full-Scale Exercise
HAZMAT	Hazardous Materials
HM-EEM	Hazardous Materials Exercise Evaluation Methodology
HMIS	Hazardous Materials Information System
HMIX	Hazardous Materials Information Exchange
ICS	Incident Command System
IEMIS	Integrated Emergency Management Information System
IEMS	Integrated Emergency Management System
JCAHO	Joint Commission on Accreditation of Healthcare Organizations
JIC	Joint Information Center

ABBREVIATIONS/ACRONYMS (Cont'd.)

LEPC	Local Emergency Planning Committee
MSDS	Material Safety Data Sheet
NACD	National Association of Chemical Distributors
NCP	National Contingency Plan
NH	Natural Hazard
NOAA	National Oceanic and Atmospheric Administration
NRC	National Response Center
NRT	National Response Team
NRT-1	"Hazardous Materials Emergency Planning Guide," March 1987, National Response Team
NRT-1A	"Criteria for Review of Hazardous Materials Emergency Plans," May 1988, National Response Team
NS	National Security
NTTC	National Tank Truck Carriers
OSC	On-Scene Coordinator
OSHA	Occupational Safety and Health Administration
PIO	Public Information Officer
PPE	Personal Protective Equipment
REP	Radiological Emergency Preparedness
RRT	Regional Response Team
RSPA	Research and Special Programs Administration (DOT)
SARA	Superfund Amendments and Reauthorization Act of 1986
SERC	State Emergency Response Commission
SLE	State and Local Exercise Annex
SOP	Standard Operating Procedure
STCC	Standard Transportation Commodity Classification
TAT	Technical Assistance Team
TH	Technological Hazard
TT	Tabletop Exercise
TRANSCAER	Transportation Community Awareness and Emergency Response
USCG	U.S. Coast Guard

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APPENDICES A-G

APPENDIX A

HAZARDOUS MATERIALS EXERCISE EVALUATION METHODOLOGY (HM-EEM) AND MANUAL OBJECTIVES

OBJECTIVE 1: EMERGENCY CONDITION LEVELS

Demonstrate the ability to understand, use, and monitor emergency condition levels through the appropriate implementation of emergency functions and activities corresponding to emergency condition levels. The three standard levels are potential emergency condition, limited emergency condition, and full emergency condition.

OBJECTIVE 2: STAFF MOBILIZATION AND 24-HOUR OPERATIONS

Demonstrate the ability to fully alert, mobilize, and activate personnel for emergency response and maintain operations over a 24-hour period.

OBJECTIVE 3: DIRECTION AND CONTROL

Demonstrate the ability to direct, coordinate, and control emergency activities.

OBJECTIVE 4: SUPPLEMENTARY ASSISTANCE

Demonstrate the ability to identify the need for and request emergency assistance from Federal and other support agencies.

OBJECTIVE 5: COMMUNICATIONS

Demonstrate the ability to effectively communicate with all appropriate emergency response locations, organizations, and personnel.

OBJECTIVE 6: FACILITIES, EQUIPMENT AND DISPLAYS

Demonstrate the adequacy of facilities, equipment, displays, and other materials to support emergency operations.

OBJECTIVE 7: ALERT AND NOTIFICATION

Demonstrate the ability to alert the public of a hazardous materials emergency and begin dissemination of instructional messages in a timely manner.

OBJECTIVE 8: EMERGENCY PUBLIC INFORMATION

Demonstrate the capability of coordinating and disseminating accurate information regarding a hazardous materials incident to the media and the public in a timely a manner.

OBJECTIVE 9: POPULATION PROTECTIVE ACTION

Demonstrate the ability to make and implement appropriate protective action decisions based upon projected risk to the public.

OBJECTIVE 10: EMERGENCY WORKER DECONTAMINATION

Demonstrate the ability to monitor and control emergency worker contamination, and the adequacy of procedures for waste disposal and equipment and vehicle decontamination.

APPENDIX A

HAZARDOUS MATERIALS EXERCISE EVALUATION METHODOLOGY (HM-EEM) AND MANUAL OBJECTIVES (Cont'd.)

OBJECTIVE 11: TRAFFIC AND ACCESS CONTROL
Demonstrate the organizational ability and resources necessary to control evacuation traffic flow and to control access to evacuated and sheltered areas.

OBJECTIVE 12: POPULATION CONTAMINATION CONTROL
Demonstrate the ability to monitor and control hazardous materials contamination of the public through an appropriate registration, contamination screening, and decontamination process.

OBJECTIVE 13: RELOCATION CENTERS
Demonstrate the adequacy of procedures, facilities, equipment, and personnel for the congregate care of evacuees. If appropriate, demonstrate the adequacy of procedures for the registration, contamination screening, and decontamination of evacuees.

OBJECTIVE 14: MEDICAL SERVICES - TRANSPORTATION AND FACILITIES
Demonstrate the adequacy of personnel, procedures, equipment, and vehicles for transporting contaminated and/or injured individuals, and the adequacy of medical personnel and facilities to support the operation.

OBJECTIVE 15: REENTRY AND RECOVERY
Demonstrate the ability to determine and implement appropriate measures for controlled reentry and recovery.

Source: Federal Emergency Management Agency (FEMA).

Special Note: For copies of the HAZARDOUS MATERIALS EXERCISE EVALUATION METHODOLOGY (HM-EEM) and MANUAL, contact your FEMA Regional Office.

APPENDIX B

FEMA FORM 95-16
EXERCISE DATA

FEDERAL EMERGENCY MANAGEMENT AGENCY
EXERCISE DATA

FY | QUARTER | *O.M.B. No. 3067-0189 Expires October 31, 1991*

1. FEMA REGION	2. STATE	3. JURISDICTION	4. FIPS CODE	5. POPULATION	6. EMA FUNDED JURISDICTION ☐ Yes ☐ No

7. LEVEL OF EXERCISE
☐ Single Jurisdiction ☐ State
☐ Multijurisdiction

8. EOC ACTIVATED ☐ YES ☐ NO

9. FIELD COMMAND POST ESTABLISHED ☐ YES ☐ NO

10. DATE(S) OF EXERCISE

11. PURPOSE OF EXERCISE *(Check as many as apply)*
☐ Test Reporting Procedures
☐ Enhance Agency Coordination
☐ Validate Emergency Operations Plan (EOP)
☐ Satisfy CCA Program Requirements
☐ EMA ☐ REP ☐ HP
☐ Hazardous Materials ☐ Other: _____
☐ Increase Awareness of Capabilities & Vulnerabilities
☐ Other: _____

12. TYPE OF EXERCISE
☐ Functional (FE) ☐ Tabletop (TT)
☐ Fullscale (FSE)
☐ Actual Occurrence *(Disaster Response Questionnaire FEMA Form 90-2 submitted)*
☐ Yes ☐ No

13. HAZARDS SCENARIO *(Circle "P" to indicate the Primary Hazard and "S" for all Secondary Hazards.)*

NATURAL HAZARDS (NH)
P S Earthquake
P S Flood
P S Hurricane
P S Tornado
P S Fire (wild)
P S Winter Storm
P S Other: _____

TECHNOLOGICAL HAZARDS (TH)
P S HAZ MAT: ☐ Stationary ☐ Transportation
P S Dam Failures
P S Nuclear Power Plant
P S Radiological
P S Fire (urban)
P S Transp. Accident ☐ Air ☐ Water ☐ Rail ☐ Highway
P S Other: _____

NATIONAL SECURITY (NS)
P S Attack ☐ Nuclear ☐ Conventional
P S Other: _____

14. NUMBER OF RESPONSE PARTICIPANTS *(Indicate numoer of personnel in each category represented)*

___ Elected Official(s)	___ Civil Air Patrol	___ City/County Administration	___ Federal Responders
___ Police	___ Environmental Agency	___ Red Cross	___ Private Industry
___ Sheriff/Deputies	___ Public Works	___ Salvation Army	___ Public Information
___ State Patrol/Police	___ Hospital Personnel	___ School Personnel	___ News Media
___ Fire	___ Social Services	___ Amateur Radio	___ Engineering
___ Search & Rescue	___ Public Health	___ Utilities	___ Volunteer Victims
___ EMS	___ Mental Health	___ Emergency Management	___ Other: _____
___ National Guard	___ Radiological Health	___ Transportation	_____ TOTAL Participants

15. FUNCTIONS EVALUATED/TESTED *(Check under "Y" if function performed according to plan, "N" if it did not. Leave blank if not tested)*

Y N	Y N	Y N	Y N
___ ___ Warning	___ ___ Law Enforcement	___ ___ Resource Management	___ ___ Evacuation
___ ___ Alert/Notification	___ ___ Health & Medical	___ ___ EOC/Direction-Control	___ ___ Fire
___ ___ Communications: ☐ Equipment ☐ Interagency	___ ___ Emergency Public Info.	___ ___ Transportation	___ ___ Search & Rescue
	___ ___ Damage Assessment	___ ___ Legal Auth. & Resp.	Other:
___ ___ Shelter	___ ___ Public Works Engr.	___ ___ EMS	___ ___ _____
___ ___ Radiological Prot.	___ ___ Utilities	___ ___ Mutual Aid	___ ___ _____
	___ ___ Incident Command System		

16. PROBLEMS ENCOUNTERED *(Check as many as apply)*
☐ Inadequate Emergency Operations Plan
☐ Warning
☐ Alert/Notification
☐ Inadequate Training
☐ Agency Response
☐ Radiological Prot.
☐ Standard Operating Procedures
☐ Lack of Resources *(generators, equipment)*
☐ Inadequate Crowd/Traffic Control
☐ Lack of Elected Official Support
☐ Message Control In EOC
☐ Communications
☐ Inadequate Interagency Coordination
☐ Lack of Personnel
☐ Other: _____

17. PRE-EXERCISE TRAINING *(Training courses conducted for either some or all of the participants)*
☐ Exercise Design
☐ Exercise Briefings/Orientations
☐ Table Top Exercise(s)
☐ Other: _____

18. REMEDIAL/FOLLOW-UP ACTION PLAN(S)
☐ Update Plan
☐ Additional Training *(type)* _____
☐ Other *(list)* _____

19. NEXT SCHEDULED EXERCISE
Month/Year _____ Type: ☐ TT ☐ FE ☐ FSE Hazard: ☐ NH ☐ TH ☐ NS

20. PREPARED BY *(Print name and title)*	21. STATE EXERCISE ASSIST. OFFICER (EAO)	22. EAO FORM REVIEW/ APPROVAL
SIGNATURE	*SIGNATURE*	☐ Yes ☐ No

FEMA Form 95-16, OCT 88 REPLACES EDITION OF AUG 86, WHICH IS OBSOLETE.

Continued on reverse

APPENDIX B

FEMA FORM 95-16
EXERCISE DATA (Cont'd.)

23. ACCOMPLISHMENTS/SURVEY (Use)

APPENDIX C

SAMPLE TABLETOP EXERCISE SCENARIO AND SEQUENCE OF EVENTS

XYZ Chemicals, Inc., produces a small line of acids for sale in the manufacturing and trade markets. XYZ stores and handles a variety of chemicals on-site for use in its own processes; in addition, XYZ products are often stored on plant grounds pending shipment to customers.

XYZ's Lake City plant is located in a neighborhood characterized by a mix of industrial and residential land uses. Local industrial facilities include two large steel plants, an oil refinery and numerous specialty chemical plants. The XYZ facility itself is bounded on the north by a spur of the Union Railroad; on the south by the Grand River; on the west by Elm Street and a rail line; and on the east by First Street. Beyond the river on the south is an interstate highway that is heavily traveled. Within two miles north of the plant are seven schools and a hospital. Just north of the plant, across the Union tracks, is a residential neighborhood; additional residential zones of Lake City and Middletown lie one and one-half miles to the south and southwest, and three miles to the southeast.

Returning from their 12 P.M. break, two XYZ workers resume the task of transferring anhydrous hydrogen fluoride (AHF) from a pressurized rail car to a 15,000 gallon outdoor storage tank. They had allowed the transferring pump to operate unattended and found upon returning that the failure of an automatic shutoff valve resulted in a spill of approximately 1,000 gallons. The liquid AHF has begun to pool, giving rise to vapor. Inhaling these vapors, both workers suffer severe respiratory injury. Although one worker collapses immediately, the other succeeds in activating the plant safety alarm, thereby alerting the shift supervisor that an emergency has occurred at the transfer site.

The supervisor drives to investigate the accident. Smelling the strong presence of HF vapors in the air, the supervisor stops his vehicle 200 feet from the accident site and radios the plant gate to notify the Lake City emergency response authorities by calling 911. In the presence of suiting up with protective equipment, the supervisor himself collapses.

****

SEQUENCE OF EVENTS AND EXPECTED ACTIONS

****EVENT 1: Plant Supervisor Calls 911****

Message:

From: Plant employee
To: 911

"This is a drill. There has been a chemical spill at the XYZ plant on Elm Street."

Note: No information is provided on identity of chemicals involved.

SEQUENCE OF EVENTS AND EXPECTED ACTIONS (Cont'd.)

****EVENT 1: Plant Supervisor Calls 911 (Cont'd.)****

Expected Actions:

- 911 makes necessary notifications, including:[1]
  - Police Department
  - Fire Department
  - Emergency Medical Services

- Other notifications made, including:
  - State Department of Environmental Management
  - State Police
  - Plainville Fire Department (to activate mutual aid)
  - Middletown Hazmat Squad
  - CHEMTREC/CHEMNET
  - National Response Center

****EVENT 2: Flow Of Chemical Continuing At A Rapid Rate. Plant Personnel Evacuate. Six Workers Suffering Eye And Respiratory Irritation. Condition Of Shift Supervisor And Two Workers Unknown. Also Unknown Whether All Other Personnel Are Safely Out Of Plant.****

Expected Actions:

- First Responders (whether Fire, Police, or Emergency Medical Services (EMS)) - Situation assessment:
  - Confer with plant personnel to determine identity of chemical(s)
  - Count the number of evacuated personnel

Messages:

From: Plant employee
To: First responders

"The chemical leaking from tank is Anhydrous Hydrofluoric Acid (AHF); judging from the rate of vapor formation, it is a rapid leak."

---

[1]Underlining identifies most important response activities.

SEQUENCE OF EVENTS AND EXPECTED ACTIONS (Cont'd.)

****EVENT 2: Flow Of Chemical Continuing At A Rapid Rate. Plant Personnel Evacuate. Six Workers Suffering Eye And Respiratory Irritation. Condition Of Shift Supervisor And Two Workers Unknown. Also Unknown Whether All Other Personnel Are Safely Out Of Plant. (Cont'd.)****

From: Plant employee
To: First responders

"Plant personnel have evacuated. Six evacuated workers have suffered injury. Shift supervisor and two employees are known missing. Not known whether all other workers have been safely evacuated."

- Police Department (when they arrive):
  - Close off access to plant

- EMS (when they arrive):
  - Establish treatment zone in a safe area
  - Begin examining/treating injured workers
  - Radio for backup units
  - Notify City Hospital to expect injured

- Fire Department (when they arrive):
  - Establish command post in a safe area
  - Delineate "restricted areas", staging area, decontamination zone
  - Determine personnel and equipment needs
  - Call for additional resources, as needed
  - Squad 1 personnel (and possibly Middletown Hazmat team) suit up in protective clothing to investigate leak and injured
  - Squad 1 approaches accident site from upwind position
  - Spokesman issues initial press statement

****EVENT 3: Wind Observed Blowing Out Of South/Southwest At 5 MPH****

Message:

From: Exercise Director
To: Fire Department Incident Commander

"Winds blowing out of south/southwest at 5 MPH."

SEQUENCE OF EVENTS AND EXPECTED ACTIONS (Cont'd.)

****EVENT 3: Wind Observed Blowing Out Of South/Southwest At 5 MPH (Cont'd.)****

Expected Actions:

- Begin consideration of evacuation option
- Evacuation notices begin:
  - School bus company (to dispatch 3 buses)
  - Red Cross, Salvation Army
  - Lake City Civil Defense

****EVENT 4: Three Additional Injured Plant Workers Discovered In Plant Powerhouse****

Message:

From: Exercise Director
To: Fire Department Incident Commander

"Three more injured workers have called in from plant powerhouse."

Expected Actions:

- Fire Department/Middletown Hazmat personnel (with protective gear) dispatched to powerhouse to evacuate additional injured
- Shift supervisor, two other initial injured employees evacuated by Squad 1 personnel to decontamination zone
- Initial injured are decontaminated (as necessary)
- Initial injured are taken to EMS treatment zone
- EMS begins triage/hospital evacuation procedures on initial injured

SEQUENCE OF EVENTS AND EXPECTED ACTIONS (Cont'd.)

****EVENT 5: As A Result Of Valve Closure, The Flow Of AHF Has Stopped; Vapor Formation Stops****

Messages:

None.

Expected Actions:

- Fire Department crew notifies Fire Department Incident Commander that leak has been stopped
- Fire Department begins vapor suppression, pool containment procedures
- Fire Department personnel evacuate additional injured from powerhouse to decontamination zone
- Squad 1 members, additional injured decontaminated (as necessary)
- Additional injured taken to EMS treatment area
- EMS begins triage/hospital evacuation procedures

****EVENT 6: Response Completed; Incident Over****

Messages:

From: Exercise Director
To: Fire Department Incident Commander

"The incident is over."

SEQUENCE OF EVENTS AND EXPECTED ACTIONS (Cont'd.)

****EVENT 6: Response Completed; Incident Over (Cont'd.)****

Expected Actions:

- All response personnel notified
- Triage/hospital evacuation completed
- Access to plant reopened
- Clean-up contractor(s) notified
- Press is briefed by press spokesman, plant spokesman

APPENDIX D

SAMPLE FULL-SCALE EXERCISE SCENARIO AND SEQUENCE OF EVENTS

The PQX Chemical Co. plant, located on Lee Highway, manufactures a variety of corrosive, toxic, and flammable chemicals. Many of these chemicals are stored at the plant pending shipment to customers. The plant occupies 50 acres of land and is situated in an area composed of commercial, industrial, and residential buildings. The plant property is bounded on the north by Lee Highway, on the east by a rail line, on the south by Interstate 20 and on the west by the Black River. Beyond the river to the west in the Black River Estates housing development. South of Interstate 20 is the Clover Hill housing development. On the north side of Lee Highway lies a mixture of commercial and industrial buildings. East of the railroad line, there are a variety of industrial facilities. A railroad siding extends into the plant property to the outside storage area.

One clear Saturday morning, a day when the plant is not operating, a repair crew is working on replacing a section of pipe that is connected to the top of an empty tank. After disconnection, a crane is used to lower the pipe onto a flat bed truck. As the crane boom is swung over a nearby tank of liquid sulfur trioxide (SO_3), the cable snaps, thus , dropping the pipe. The falling pipe shears off the SO_3 tank's feedline between the tank wall and the first block valve. The four-inch diameter feedline leading from the tank to the process plant begins leaking immediately. An excess flow valve between the leak and the tank limits the rate of flow to 30 gallons per minute.

Spilled liquid from the SO_3 tank collects within the containment dike surrounding the tanks. Upon contact with the moisture in the air, the spilled SO_3 vaporizes into a white mist resembling steam. The wind, coming from the northwest at 5 mph, blows the vapors directly onto the nearby repair crew that had removed the old piping. Three of the four repairmen are affected by the vapors, with two of them lying unconscious on top of the tank they had been working on. The lone conscious repairman drags the remaining workers from the hazardous area and then runs into the main plant to report the accident. Experiencing burning eyes and difficult breathing, he decides to remain indoors awaiting the arrival of the fire department.

****

SAMPLE SEQUENCE OF EVENTS

****EVENT #1: The Northeasterly Wind Blows The Vapor Cloud Coming Off The Spilled Sulfur Trioxide Towards The Southwest Across Plant Property. Arriving Fire/Rescue Personnel Find An Unconscious Person Just Beyond The Diked Area.****

Simulation Message:

Simulators will set off a white smoke grenade or other smoke/cloud generation device to simulate the SO_3 vapor cloud. Large portable fans may have to be employed to direct the vapors in the desired direction dictated by the exercise. An exercise "victim" should be lying outside of the diked area by away from the white smoke/cloud. Water from a hoseline attached to the feedline of the SO_3 tank will be flowing at a rate of 30 gmp into the diked area to simulate the leaking SO_3.

Written/Verbal Messages:

None.

SAMPLE SEQUENCE OF EVENTS (Cont'd.)

****EVENT #1: The Northeasterly Wind Blows The Vapor Cloud Coming Off The Spilled Sulfur Trioxide Towards The Southwest Across Plant Property. Arriving Fire/Rescue Personnel Find An Unconscious Person Just Beyond The Diked Area. (Cont'd.)****

Expected Actions:

- First arriving fire/rescue units report the on-scene situation to the emergency communications center and request additional fire/rescue and police units (if necessary).
- Rescue unconscious person near diked area and provide emergency medical treatment following rescue.
- Incident commander takes command and establishes:
  - Command post (in safe location)
  - Communications among response agencies at scene
  - Staging area for in-coming apparatus
  - Mechanism for on-going incident assessment
- Ensure that emergency personnel wear appropriate protective gear.
- Secure area around the incident scene.
- Attempt to locate a plant official who can identify the leaking material and provide technical expertise concerning the tank, feedline, control valves, dike, etc.

****EVENT #2: The Injured Repairman That Reported The Accident Advises Fire/Rescue Personnel Of The Two Unconscious Workers On Top Of The Tank Next To The Leaking Tank. The Repairman Tells How The Accident Occurred And Warns Of The Hazards Of The Vapors Emanating From The Spilled Liquid.****

Simulation Message:

Simulators will continue to generate a white cloud to simulate the vaporizing SO_3. The simulated leak will also be continued. The repairman "victim" will be acting as if he is having trouble breathing and a burning sensation in his eyes.

Verbal Message:

To: Fire/Rescue Personnel
From: Injured Repairman

"Joe and Charlie are still up on the tank. I think they've passed out. Do you see them? They were still up there when the pipe fell from the cable and hit the other tank. I don't know what that leaking stuff is, but watch out, it's nasty."

APPENDIX D (Cont'd.)

SAMPLE SEQUENCE OF EVENTS (Cont'd.)

****EVENT #2: The Injured Repairman That Reported The Accident Advises Fire/Rescue Personnel Of The Two Unconscious Workers On Top Of The Tank Next To The Leaking Tank. The Repairman Tells How The Accident Occurred And Warns Of The Hazards Of The Vapors Emanating From The Spilled Liquid. (Cont'd.)****

Expected Actions:

- Plan strategy for the rescue of the two unconscious workers on top of the tank.
- Provide emergency medical treatment for the repairman experiencing difficult breathing and burning eyes.
- Contact CHEMTREC and/or other technical assistance organizations for assistance in identifying the leaking chemical.
- Activate the off-site emergency operations center (EOC) and notify key officials and agencies of the local government.
- Continue efforts to locate a plant official.
- Continue efforts to identify the leaking material.
- Identify strategies and options for controlling the leak.
- Arrange for specified equipment to be brought to the scene:
  - Encapsulated suits
  - Self-contained breathing apparatus
  - Environmental monitors
  - Patching/plugging materials
  - Foam
  - Diking materials
  - Emergency medical supplies
- Notify the following:
  - Community Emergency Coordinator
  - National Response Center
  - State Environmental Protection Agency

APPENDIX D (Cont'd.)

SAMPLE SEQUENCE OF EVENTS (Cont'd.)

****EVENT #3: The Vapor Cloud Is Approaching Interstate 20****

Simulation Message:

Simulators will continue to generate the white cloud but not in amounts great enough to transport the cloud to the interstate, thus avoiding obstructing the view of passing motorists not involved in the exercise. The purpose of the cloud is for realism at the actual storage tank area.

Verbal Message: (via two-way radio)

To: On-Scene Incident Commander
From: Emergency Communications Center

"Motorists on Interstate 20 are reporting "white smoke" just north of the interstate. Could that be coming from your location?"

Expected Actions:

- Initiate monitoring of vapor cloud and spill.
- Confirm vapor cloud movement.
- Close Interstate 20 downwind of the vapor cloud.
- Consider protective actions for residents south of Interstate 20.
- Request mutual aid (if necessary):
  - Fire/rescue
  - Hazardous materials team
  - Emergency medical services
  - Law enforcement
- For arriving mutual aid units:
  - Brief them about incident
  - Assign tasks to them
  - Ensure they wear appropriate protective gear
  - Establish inter-organizational communications
- Establish communications between the on-scene command post and the EOC, and coordinate all response actions.

****EVENT #3: The Vapor Cloud Is Approaching Interstate 20 (Cont'd.)****

- Expand efforts to secure the area around the incident scene:
  - Roadblocks
  - Rerouting of traffic
  - Spectator control
- Establish a media center and appoint a public information officer.

****EVENT #4: Fire/Rescue Personnel Have Located The Two Unconscious Workmen On Top Of The Tank Next To The Leaking Tank****

Simulation Message:

Simulators will continue to generate the white cloud and allow the 30 gpm flow of water into the diked area to continue. The two "victims" on top of the tank should lie still to simulate unconsciousness.

Written/Verbal Message:

None.

Expected Actions:

- Rescue the two unconscious workers if it is decided that adequate protective gear is available at the scene for rescuers.
- Provide emergency medical treatment for the two unconscious workers following their rescue.
- Establish an on-scene triage area for injured workers and emergency response personnel.

****EVENT #5: The Vapor Cloud Has Moved As Far As Interstate 20 And Is Fast Approaching The Clover Hill Housing Development. A Plant Official Arrives On The Scene And Advises The Incident Commander That The Leaking Product Is Liquid And That The 70-Ton Capacity Tank Was Approximately 80 Percent Full Prior To The Accident.****

Simulation Message:

Simulators will continue to generate the white cloud in the area near the tanks and continue the flow of water into the diked area.

SAMPLE SEQUENCE OF EVENTS (Cont'd.)

**EVENT #5:	**The Vapor Cloud Has Moved As Far As Interstate 20 And Is Fast Approaching The Clover Hill Housing Development. A Plant Official Arrives On The Scene And Advises The Incident Commander That The Leaking Product Is Liquid And That The 70-Ton Capacity Tank Was Approximately 80 Percent Full Prior To The Accident. (Cont'd.)****

Verbal Messages:

To: On-Scene Incident Commander
From: Emergency Communications Center

"Motorists are now reporting a white mist coming across the interstate from the northwest. They advise that it's irritating to their eyes and throats."

To: On-Scene Police Department Commander
From: Patrol Unit

"The vapors from your location have reached Interstate 20 and are heading towards Clover Hill. Please advise."

To: On-Scene Incident Commander
From: PQX Chemical Company Official

"The leaking product is SO_3. *As of close of business yesterday, it contained approximately 55 tons of* SO_3."

Expected Actions:

- Evacuate Clover Hill and other nearby residences.
- Open emergency shelters for evacuees.
- Disseminate information to all emergency response personnel and agencies involved in the incident that the leaking material has been identified as liquid SO_3.
- Contact CHEMTREC and/or other technical assistance organizations for:
  - Chemical specific information
  - Associated health hazards
  - Recommended control/cleanup actions
- Ensure that protective gear is compatible with SO_3 is worn by all emergency personnel operating in the vicinity of the leaking tank and vapor cloud.
- Continue monitoring the vapor cloud for movement and concentration.
- Identify strategies and options for reducing the quantity of vapors emanating from the spilled SO_3.
- Continue efforts to identify strategies and options for controlling the leak.

SAMPLE SEQUENCE OF EVENTS (Cont'd.)

****EVENT #5: The Vapor Cloud Has Moved As Far As Interstate 20 And Is Fast Approaching The Clover Hill Housing Development. A Plant Official Arrives On The Scene And Advises The Incident Commander That The Leaking Product Is Liquid And That The 70-Ton Capacity Tank Was Approximately 80 Percent Full Prior To The Accident. (Cont'd.)****

- Coordinate response efforts between the on-scene incident commander, plant officials, and the EOC.

- Provide public information concerning:
  - Hazards
  - Evacuation
  - Safety/precautions
  - Details of remedial actions

****EVENT #6: Despite Vaporization, The Diked Area Is Filling Up Rapidly With Spilled Liquid.****

Simulation Message:

Simulators will continue to allow the water to flow from the hoseline into the diked area at a rate of 30 gallons per minute. The white cloud will also continue to be generated to simulate vaporization of product.

Written Message: (via messenger)

To: On-Scene Incident Commander
From: Simulator

"The diked area contains a considerable amount of SO_3 and continues to fill at a rapid rate."

Expected Actions:

- Arrange for the off-loading of the SO_3 from the damaged tank to other large capacity tanks that are compatible with SO_3.

- Identify strategies and options for removing the SO_3 contained within the dikes.

SAMPLE SEQUENCE OF EVENTS (Cont'd.)

****EVENT #7: Winds Begin To Shift From The Northeast To The Southeast. The National Weather Service's Forecast Calls For Temperatures And Humidity To Increase As Winds Shift.****

Simulation Message:

Simulators will employ the use of large fans (if necessary) to simulate a wind shift so that the white cloud will blow towards the west instead of the southwest. The simulated SO_3 spill will be continued at 30 gpm.

Written Messages: (via messenger)

To: On-Scene Incident Commander
From: National Weather Service

"Be advised that winds will be shifting over the next 10-12 hours to the southeast at 3 mph. Temperatures will rise 5-7 degrees, and humidity will increase as well."

Verbal Messages: (via two-way radio)

To: On-Scene Police Department Commander
From: Patrol Unit

"I'm at the roadblock along westbound Interstate 20. It looks as though the vapor cloud is heading more towards the west now, in the direction of Black River Estates."

To: On-Scene Incident Commander
From: Emergency Communications Center

"Citizens are reporting irritating vapors in the Black River Estates area. We've received several calls on this."

Expected Actions:

- Disseminate information to all emergency response personnel and agencies involved in the incident concerning the wind shift and weather forecast.
- Evacuate the Black River Estates housing development.
- Open additional emergency shelters for evacuees.
- Expand efforts to secure the area to the west of the plant:
  - Set up roadblocks
  - Reroute traffic
  - Control spectators

SAMPLE SEQUENCE OF EVENTS (Cont'd.)

**EVENT 8:	An Unconscious Person Has Been Spotted In A Canoe Floating Down The Black River Just West Of The Plant. In Addition, Numerous Residents West Of The Plant Have Been Injured.**

Message:

Simulators will continue their efforts to direct a white cloud towards the west. They will also continue to allow water to flow at 30 gpm into the diked area. One "victim" will lie in a slumped position in a canoe in a calm spot on the river. Several "victims" in the Black River Estates will act as though they are experiencing difficult breathing and burning eyes.

Verbal Messages: (via two-way radio)

To: Emergency Medical Services Commander
From: Emergency Communications Center

"We've received a report of an unconscious person in a canoe on the Black River between the POX plant and Interstate 20. The caller saw the canoe floating from the area affected by the vapor cloud."

To: Emergency Medical Services Commander
From: Emergency Communications Center

"Police report finding numerous persons in the process of evacuating Black River Estates who requested emergency medical treatment for irritated eyes and noses."

Expected Actions:

- Provide emergency medical treatment for numerous injured persons.
- Rescue the unconscious canoeist.
- Evacuate the commercial/industrial area northwest of the plant.
- Expand efforts to secure the area to the northwest of the plant:
  - Set up roadblocks
  - Reroute traffic
  - Control spectators
- Continue monitoring vapor cloud for movement and concentration.
- Apply acid-based foam (if available) to the surface of the contained SO_3 to prevent the release of hazardous vapors.

APPENDIX D (Cont'd.)

SAMPLE SEQUENCE OF EVENTS (Cont'd.)

****EVENT #9: Two Railroad Tankcars Have Been Brought Onto The Siding Next To The SO_3 Tank. Off-Loading Operations Of The Tank Will Be Difficult Due To The Presence Of Spilled Liquid Around The Tank Within The Diked Area****

Simulation Message:

Simulators will continue to allow water to flow into the diked area and will continue to generate a white cloud and direct it towards the west.

Verbal Messages:

To: Plant Official
From: Railroad Engineer

"How should I position the two empty tankcars for off-loading operations?"

To: On-Scene Incident Commander
From: Senior Fire Department Officer

"We're going to have a difficult time gaining access to the unloading outlet on the tank with all this liquid SO_3 around the base of the tank. It would be unsafe to have anyone walk through the liquid, even if they're wearing Level A protective gear."

Expected Actions:

- Identify strategies and options for gaining access to the unloading outlet on the SO^3 tank without endangering the lives of the personnel assigned the task.
- Off-load the SO_3 from the tank to the railroad tank cars.
- Continue monitoring the vapor cloud for movement and concentration.

****EVENT #10: The Product Has Been Completely Off-Loaded From The Tank To The Railcars, Thus, Ending the Leak. Vapors, However, Continue To Be Given Off From The Spilled Liquid Within The Dikes.****

Simulation Message:

Simulators will continue to generate a white cloud and direct it towards the west until actions are taken to prevent the vaporization of product and/or pump the product to tanks.

SAMPLE SEQUENCE OF EVENTS (Cont'd.)

****EVENT #10: The Product Has Been Completely Off-Loaded From The Tank To The Railcars, Thus, Ending The Leak. Vapors, However, Continue To Be Given Off From The Spilled Liquid Within The Dikes. (Cont'd.)****

Verbal Messages

To: On-Scene Incident Commander
From: Senior Fire Department Officer

"We just finished off-loading the SO_3 to the tankcars. The leak has stopped."

To: On-Scene Incident Commander
From: Senior Fire Department Officer

"The contained liquid is still vaporizing."

Expected Actions:

- Disseminate information to all emergency responders and agencies involved in the incident that the leak has been stopped but that hazardous vapors continue to be generated from the spilled material.
- Continue monitoring the vapor cloud for movement and concentration.
- Apply acid-based foam (if available) to the surface of the contained SO^3 to prevent the release of hazardous vapors (if not already done).
- Pump liquid SO_3 from the containment dikes into rail tank cars or other compatible tanks.
- Consider post-incident operations, following the complete elimination of hazards, including:
  - Cleanup
  - Decontamination of personnel, equipment, apparatus, and property
  - Removal and disposal of hazardous wastes
  - Re-entry of evacuees to residential areas
  - Opening of roads and the evacuated commercial/industrial area
  - Continued air monitoring

APPENDIX E

LIST OF POSSIBLE SIMULATION EXERCISE PARTICIPANTS

Fire Departments:
- Local
- Industrial

Medical:
- Ambulance
- Rescue squads
- Toxicologists
- Doctors
- Poison control center
- Hospital
- Red Cross

Police Departments:
- Local
- County
- State
- Highway Patrol
- Sheriff
- Industrial security

Civil Defense/Disaster Services:
- Local
- State
- Federal Emergency Management Agency (FEMA)

Health Departments:
- Local
- State
- Federal Centers for Disease Control (CDC)

Public Works/Utilities:
- Water
- Sewage treatment
- Electric/gas

Environmental Scientists:
- Local
- State
- Private
- Universities

Local Emergency Response Contractors:
- Mitigation
- Removal
- Heavy equipment

Federal Agencies:
- U.S. Coast Guard
- National Oceanic and Atmospheric Administration
- Department of Transportation
- Army Corps of Engineers
- National Guard
- Environmental Protection Agency
- U.S. Geologic Survey
- Fish and Wildlife Service
- FEMA

Local Hazardous Materials Carriers:
- Truck
- Rail
- Barge

Chemical Experts:
- Industry
- University
- CHEMTREC

Meteorologists:
- National Weather Service
- Television
- Airport

Communications:
- Radio
- Television

APPENDIX F

PLANNING CHECKLIST FOR TABLE-TOP OR FIELD EXERCISE SIMULATIONS

Key Threshold Actions:

- Has the site of the simulated incident been identified?
- Is there a local contingency plan or standard operating procedures in effect?
- Have planning issues or response needs been identified? If so, what are they?
- What type of simulation do you want to undertake?
- Who will participate in the exercise?
- How will the exercise be documented?
- Has the scenario description been developed?
- Have the sequence of events and control materials been developed?
- What equipment is required for the exercise? (See "The Day Before" for exercise planning guide, EPA Region VII.)

APPENDIX G

FIELD SIMULATION EQUIPMENT LIST*

Props:
- Drums
- Tanks
- Boxes
- Vehicles
- Moulage
- Water
- Simulated hazardous materials
- Smoke
- Pyrotechnic supplies
- Other

Firefighting/Suppression:
- Trucks/apparatus
- Tools/equipment
- Foam and equipment
- Fire extinguishers
- Other

Rescue and First Aid:
- Vehicles
- Stretchers
- First aid/trauma kits
- Oxygen
- Other

Containment Devices:
- Booms
- Patches, plugs
- Sand bags
- Pneumatic bags
- Plastic sheets/tarps
- Neutralizers
- Sorbents
- Shovels
- Other

Personal Protective Equipment:
- Respirators
  - Pressure demand SCBA
  - Air -purifying respirators
- Chemical protective clothing
  - Splash suits
  - Fully-encapsulating suits
  - Gloves
  - Boots
  - Disposables
  - Hardhats
  - Eye protection
  - Face shields
- Duct tape
- Other

Monitoring Instruments:
- Combustible gas indicators
- Oxygen meters
- Detector tubes
- Organic survey meters
- Radiation survey meters
- Passive dosimeters
- Specific survey instruments
- Litmus paper, pH paper
- Other

Sampling Equipment:
- Sampling devices
- Containers
- Labels
- Packaging
- Other

Communications Equipment:
- Radios/"walkie-talkies"
- Telephones
- Megaphones
- Horns

APPENDIX G

FIELD SIMULATION EQUIPMENT LIST* (Cont'd.)

Contamination Reduction Equipment:
- Buckets, tubs, containers
- Plastic
- Brushes
- Water
- Detergent
- Sprayers
- Other

References:
- EPA Extremely Hazardous Chemicals Profiles
- Department of Transportation Emergency Response Guidebook

Documentation Equipment:
- Video cameras
- Still cameras
- Tape recorders
- Note pads
- Other

Heavy Equipment:
- Backhoes
- Dump trucks
- Vacuum trucks
- Offload tankers
- Cranes
- Bulldozers
- Other

Miscellaneous:
- Meteorological equipment
- Clipboards
- Binoculars
- Salvage drums
- Barriers for site control
- Tools
- Other

* This list is adapted from "The Day Before. . .", a simulation exercise planning guide developed by the EPA Region VII Technical Assistance Team (see Appendix F).