



**NOT MEASUREMENT
SENSITIVE**

**DOE G 151.1-3
7-11-07**

Programmatic Elements Emergency Management Guide

[This Guide describes suggested nonmandatory approaches for meeting requirements. Guides are not requirements documents and are not to be construed as requirements in any audit or appraisal for compliance with the parent Policy, Order, Notice, or Manual.]



**U.S. Department of Energy
Washington, D.C.**

AVAILABLE ONLINE AT:
www.directives.doe.gov

INITIATED BY:
National Nuclear Security Administration
Office of Emergency Management

2.5.6	Operational Emergency Hazardous Material Program	2-11
2.6	Training Development	2-13
2.6.1	Training Goals and Objectives	2-13
2.6.2	Training Delivery	2-13
2.6.3	Developing Course Materials.....	2-14
2.6.4	Test Methodology	2-15
2.6.5	Course Evaluation	2-16
2.6.6	Remedial Training.....	2-16
2.7	Training Delivery.....	2-16
2.8	Drills	2-17
3.	EXERCISES.....	3-1
3.1	Introduction.....	3-1
3.2	General Approach.....	3-2
3.3	Exercise Program.....	3-3
3.4	Types of Exercises	3-4
3.4.1	Discussion-Based Exercises.....	3-5
3.4.2	Operations-Based Exercises.....	3-7
3.5	DOE/NNSA Exercise Requirements	3-9
3.6	Exercise Planning	3-11
3.6.1	Exercise Planning Team.....	3-12
3.6.2	Exercise Planning Functions	3-13
3.6.3	Exercise Planning Team Position Descriptions	3-15
3.6.4	Exercise Planning Meetings/Conferences	3-16
3.6.5	Exercise Planning Schedule	3-20
3.7	Exercise Documentation	3-21
3.7.1	Situation Manual (SITMAN).....	3-22
3.7.2	Exercise Plan (EXPLAN)	3-22
3.7.3	Controller and Evaluator Documentation	3-28
3.8	Exercise Objectives.....	3-31
3.8.1	Developing Exercise Objectives	3-31
3.8.2	Basis for Exercise Objectives.....	3-33
3.9	Exercise Preparation	3-34
3.9.1	Controller and Evaluator Training	3-34
3.9.2	Responder and Observer Briefings	3-35
3.9.3	Exercise Setup.....	3-36
3.10	Conduct of the Exercise	3-36
3.10.1	Roles of Participants	3-36
3.10.2	Conduct	3-38
3.11	Exercise Evaluation	3-40
3.11.1	Planning and Organization of the Evaluation	3-41
3.11.2	Evaluation Process	3-44
3.11.3	Critiques	3-46
3.12	Follow-up Activities	3-47
3.12.1	Corrective Actions and Improvement Items	3-47
3.12.2	Maintaining Records.....	3-47
	APPENDIX B. Controller and Evaluator Manual.....	B-1

1. PROGRAM ADMINISTRATION

1.1 Introduction

The purpose of this chapter is to assist Department of Energy (DOE) and National Nuclear Security Administration (NNSA) field elements in complying with the DOE O 151.1C (the Order) requirement to provide effective organizational management and administrative control of an emergency management program by establishing and maintaining authorities and resources necessary to plan, develop, implement, and maintain a viable, integrated, and coordinated program. Each manager or administrator of a DOE-, NNSA- and/or DOE/NNSA contractor-operated facility/site or activity subject to this Order shall designate an individual to administer the emergency management program. This individual shall develop and maintain the emergency plan, develop the (Emergency Readiness Assurance Plan (ERAP) and its annual updates, develop and conduct training and exercise programs, coordinate assessment activities, develop related documentation, develop a system to track and verify correction of findings or lessons learned, and coordinate emergency resources. Responsible administrators of emergency management programs should use the guidance in this chapter to define responsibilities and implement functions to ensure and maintain effective emergency **planning, preparedness, readiness assurance, and response** activities.

This chapter is designed primarily for facilities/sites or activities that are required to implement an Operational Emergency Hazardous Material Program and is directed at operations and emergency management staff at Field Elements and operating contractor organizations responsible for DOE and NNSA facilities/sites or activities.

This guide cancels and supersedes the following.

- DOE G 151.1-1, Vol. 5, Ch. 1, *Program Administration*, dated 8-21-97
- DOE G 151.1-1, Vol. 5, Ch. 2, *Standard Format and Content for Emergency Plans*, dated 8-21-97
- DOE G 151.1-1, Vol. 5, Ch. 3, *Emergency Readiness Assurance Plans (ERAPs)*, dated 8-21-97
- DOE G 151.1-1, Vol. 5, Ch. 4, *Training and Drills*, dated 8-21-97
- DOE G 151.1-1, Vol. 7, Ch. 1, *Development and Conduct of Exercises*, dated 8-21-97
- DOE G 151.1-1, Vol. 7, Ch. 3, *Exercise Controller and Evaluator Manual*, dated 8-21-97

1.2 General Approach

Management and Operating (M&O) contractor managers/administrators at each DOE/NNSA facility and site retain overall authority and responsibility for emergency management at their respective levels. However, responsibility for and authority over the development and day-to-day operation and maintenance of the program should be delegated to a specifically designated emergency management program administrator, with responsibility and authority to ensure:

- Development and maintenance of the Hazards Surveys and Emergency Planning Hazards Assessments (EPHAs), emergency plans and procedures, and related and supporting documentation
- Development and conduct of training and exercise programs, and development, conduct, and coordination of the readiness assurance program and activities [e.g., evaluations (internal and external)]
- Coordination of emergency resources by identifying resource needs and ensuring the availability of adequate resources
- Development and submittal of the annual ERAP
- Interface with State and local emergency response elements, other Federal agencies, and private institutions providing emergency medical and other emergency support to the site

The designated administrator has authority and resources in accordance with assigned responsibilities and has access to top-level management. The administrator is responsible for implementing a facility/site- or activity-specific comprehensive emergency management program based upon a graded approach that is *commensurate with hazards*.

The administration of programmatic activities (i.e., planning, preparedness, readiness assurance, and *programmatic* response element) activities is established and maintained through rigorous adherence to a formal process. Review and approval processes are established and documented to ensure that the planning and development of components of the emergency management program receive sufficient oversight by staff, management, and DOE/NNSA elements. To ensure that *programmatic* activities are initiated, completed, and periodically repeated in a timely and efficient manner, reasonable schedules are established for planning (e.g., document submission, reviews, approvals), preparedness (e.g., training), readiness assurance (e.g., self-assessments), and *programmatic* response element [e.g., maintaining Emergency Response Organization (ERO) assignment roster] functions.

Adequate resources are identified and obtained to ensure that the program is ready to respond. Financial resource requirements are identified and budgeted. Response facility needs are identified and locations established. Equipment requirements are identified;

supplies of required equipment are monitored and acquired as needed. Personnel requirements are identified and addressed.

An emergency management document control system that meets industry standards for document review, approval, distribution, and change control is established or emergency management documents are controlled under an existing site-wide document control system. An auditable administrative program for ensuring the availability of vital records (i.e., essential to the continued functioning or reconstitution of an organization during or after an emergency), regardless of media, is established and reliably maintained (Cf. DOE O 243.2). If classified information or materials are being used or generated, effective security procedures and controls are implemented, and security reviews are conducted.

Administration of an emergency management program can vary considerably from site to site depending on characteristics of the site and program, including, size, geographical layout, hazards, administrative structure of the M&O contractor, and structure and constituents of the ERO.

A small site with few facilities and hazards and a simple response structure may have one program administrator responsible for management and control of the program, who may have direct responsibility for various aspects of the detailed planning, implementation, and maintenance functions and activities. At a larger site with many facilities, more extensive hazards, and a more complicated ERO, the program administrator may delegate detailed *programmatic* responsibilities to site-level and facility-level administrators, retaining overall responsibility for site-wide program administration and control.

Information and data that the designated site administrator can track and oversee depends primarily on the size of the site and scope of the emergency management program. With only a few facilities, the program administrator at a small site is familiar with details of the site-wide program, as well as each individual facility program. The administrator at a large site may only be personally cognizant of the larger aspects of each facility program (e.g., percentage of each facility ERO trained versus the detailed data on who is trained).

On a multiple-facility site, the site emergency management program administrator is responsible for tasks similar to those of the facility program administrator (or for all tasks, if the sole administrator). In addition, the site program administrator is responsible for review and oversight of emergency management activities of facility emergency management program administration. The site program administrator must prepare guidance for facility emergency planners to ensure an effective, integrated site program is achieved when the facility capabilities are activated for a coordinated response.

The program administrator's job is to *ensure* the emergency management program is *developed and maintained* - not necessarily to *perform* all these tasks or *track/monitor* all activities personally. Emergency management authority may be delegated to subordinate administrators responsible for various aspects of the program (e.g., exercises, training, plans and procedures). The designated *emergency management program administrator* has ultimate responsibility for ensuring that requirements of the Departmental emergency

management-related policies and Orders are met. The program administrator coordinates with other site groups responsible for implementing various aspects of emergency preparedness and response (e.g., Health Physicists, Industrial Hygienists, Medical, Public Affairs, Security, Operations, and Engineering).

The general approach in this chapter focuses on functions or activities, specific responsibilities, and documentation that are expected to be accomplished at any DOE or NNSA site in order to effectively manage and administer an emergency management program. At a site with a single site administrator or at one with multiple facility/area administrators, the same management and administrative control is required to assure that emergency response capabilities are maintained and are *ready* to respond.

In the following sections, general responsibilities of program administration are discussed in the context of the key activities of an emergency management program: *planning*, *preparedness*, *readiness assurance*, and *response*.

1.3 Planning Responsibilities

As indicated in the Order, emergency *planning* includes “the identification of hazards and threats, hazard mitigation, the development and preparation of emergency plans and procedures, and the identification of personnel and resources needed for an effective response.” In the following sections, the responsibilities of program administration with respect to emergency management planning activities are divided according to the following topics: technical planning basis, program implementation, documentation, resource management, and policy issues.

1.3.1 Technical Planning Basis

The primary responsibility of the emergency management program administrator(s) is the establishment and implementation of the Comprehensive Emergency Management System. This involves the establishment of an Operational Emergency **Base Program** that coordinates and integrates the emergency planning and preparedness requirements of applicable Federal, Tribal, State, and local laws, regulations, and ordinances, and other Orders and standards of performance. As warranted, the Base Program is expanded to implement additional emergency management requirements of an Operational Emergency **Hazardous Material Program**, if hazardous materials pose a major threat to the health and safety of workers and the public.

The Hazards Survey and EPHA (if required) are the technical planning basis for establishing the scope of the facility/site- or activity-level emergency management program. Development of the Hazards Surveys and EPHA is often a complex and multi-disciplinary activity involving a number of technical skills and facility/site or activity organizations, coordinated by the emergency management program administrator(s). The program administrator(s) ensures that the proper technical staff are assigned to the efforts [e.g., health physicists when radioactive materials are involved; industrial hygienists to address toxic chemicals; meteorologists; subject matter experts (SMEs) in the transport and dispersion of hazardous materials; operations personnel; security specialists; etc.].

A key responsibility of program administrator(s) is to ensure that the technical planning basis (i.e., Hazards Surveys and EPHAs) is regularly maintained and reflects the current operations and hazards associated with the facility/site or activity. The appropriate method is dependent on the specific facility or site programs established on the site [e.g., hazardous materials inventory control systems, Integrated Safety Management Systems (ISMS)] that can be utilized to achieve emergency management objectives.

1.3.2 Program Implementation

Using the results and conclusions of the technical planning basis, the program administrator(s) coordinates the development of the emergency plan(s) and the implementing procedures for the Base Program and, as required, the Hazardous Material Program and ensures that they are *commensurate with the hazards* on the facility/site. As with the Hazards Survey and EPHA efforts, this activity may require involvement of personnel from a variety of technical areas and facility/site organizations.

The program administrator(s) ensures that emergency plans and implementing procedures are coordinated with all involved site and facility response elements, integrated for site-wide consistency, and in accordance with Departmental policies. Emergency management plans are developed for Base Program Facilities, which must address the minimum Base Program requirements, and for facilities requiring a Hazardous Material Program, whose requirements are seamlessly integrated with Base Program requirements. Coordination and cooperation of tenant facilities (if any) with the site organization in *programmatic* and *response* activities should be described in the emergency plans.

The program administrator(s) ensures that emergency plans and procedures have the following characteristics:

- Document the emergency management program, including provisions for response to an Operational Emergency (OE) and procedures to describe how the emergency plan will be implemented.
- Clearly state roles, responsibilities, and requirements associated with program administration, EROs, individual positions, operations, and interfaces.
- Describe the integration and coordination of the emergency management program with the DOE/NNSA ISMS.
- Are compliant with the requirements of the National Response Plan (NRP) and the National Incident Management System (NIMS).

1.3.3 Documentation

Documentation of the technical planning basis (i.e., Hazards Surveys and EPHAs) is an essential component of an emergency management program. It represents the technical information related to hazards on the facility/site or activity, methods and assumptions that form the foundation of the program, and documented evidence that responsible

emergency management planners understand the facility/site- or activity-specific hazards. Existing hazardous material databases and safety documentation are monitored to ensure that Hazards Surveys and EPHAs represent the current status of hazards and operations at the facility/site or activity.

The program administrator(s) is responsible for ensuring that emergency plans and procedures are developed, verified, validated, reviewed periodically, updated as necessary, and that the program receives an appropriate level of oversight. This includes providing direction and guidance for conducting and documenting reviews, assessments, and approvals to ensure they are consistent, correct, up-to-date, and complete. Program administrators ensure that reasonable schedules are established and SMEs are made available to provide competent reviews and evaluations.

Appendix A contains an outline and recommended content for an emergency plan for a facility/site required to have a Hazardous Material Program.

1.3.4 Resource Management

Emergency management programs require *resources* to function effectively. Emergency management programs are developed based on the *technical planning basis*, four *programmatic* and ten *response* program elements. Each program element requires financial, material, and human resources to develop and maintain the program.

- **Financial resources.** The program administrator(s) tracks the financial resources allocated for their emergency management programs, including costs of facilities, equipment needed to respond to emergencies, training programs, drills and exercises, and all related personnel costs. Annual budgets are prepared, based on program needs identified through the readiness assurance process. The program administrator(s) provides justification for budget requests and acts as an advocate for needed resources. (Cf. DOE Order 226.1, *Implementation of Department of Energy Oversight Policy*, for possible additional sources of information regarding the identification of program needs.)
- **Emergency facilities and equipment requirements.** Changes in Hazards Surveys and EPHAs and the results of program and exercise evaluations and self-assessments may identify needed modifications and improvements that necessitate revising or updating facilities or equipment.
- **Personnel requirements.** Program and exercise evaluations, as well as the self-assessment process, may identify additional personnel needs. These requirements should also be documented so that additional resources can be allocated.

In summary, the program administrator(s) is responsible for ensuring: adequate resources are identified and obtained to ensure that the program is ready to respond; financial resource requirements are identified and budgeted; facilities and equipment requirements are identified, monitored, and acquired; and personnel requirements are identified and

addressed. Resource needs (including personnel, facilities and equipment, and financial) are identified and justified in the annual ERAP.

1.3.5 Policy Issues

The emergency plan and associated procedures, as well as supporting planning documentation (e.g., EPHAs), must comply with DOE/NNSA policy as contained in DOE O 151.1C, *Comprehensive Emergency Management System*. A companion Emergency Management Guide (EMG), DOE G 151.1-series, provides guidance for implementing the Order requirements and represents a source for **interpreting the intent of the requirements in the Order**. The program administrator(s) is responsible for ensuring that all of the emergency management program elements are consistent with Order requirements, including both prescriptive requirements as well as broadly stated and general performance goals found in the EMG. Plans must also be fully compliant with the requirements of the NRP and NIMS.

Examples of policy issues that should be monitored include:

- The Order contains no prescriptive requirements for performing EPHAs. However, the EMG provides sufficient guidance for developing an EPHA that satisfies the intent of the Order (e.g., a spectrum of events analyzed, including beyond-design-basis events, identification of emergency recognition indicators).
- The emergency plans and associated procedures for consequence assessments and protective actions are consistent with the Order requirements in terms of the components (and phases) of the assessment process and Protective Action Criteria (PAC) selected for triggering protective actions.
- Prescriptive times for emergency notifications are given in the Order and must be followed in the facility/site and activity procedures.
- ERO training requirements (i.e., initial and refresher training) are given in the Order.

1.4 Preparedness Responsibilities

As indicated in the Order, emergency *preparedness* includes “. . . the acquisition and maintenance of resources, and the conduct of training, drills, and exercises.” In the next four sections, the responsibilities of program administration with respect to emergency preparedness activities are divided according to program plans, program implementation, documentation, and policy issues.

1.4.1 Program Planning

Training and Drills. DOE/NNSA emergency management training and drill programs ensure that personnel are *prepared* to respond to, manage, mitigate, and recover from emergencies associated with DOE/NNSA facilities/sites and activities. Training

programs can include a variety of instruction methods, such as classroom instruction, computer-based or web-based coursework, and hands-on training and drill activities.

General training for employee response, required as part of the Base Program, may be included as part of an employer's General Employee Training (GET) program. This program may include emergency awareness, warnings and alarms, evacuation and accountability, and first aid. Hazardous Material Programs have additional training requirements for developing and maintaining specific emergency response capabilities for all personnel identified as members of their EROs. The training program should be commensurate with the hazards identified in the EPHA.

The program administrator(s) must ensure the development and coordination of training program activities to prevent conflict with other activities and to ensure that resources are available. In larger facility/site programs, there may be an individual assigned to be the manager of the training program(s). In smaller programs, the designated site emergency management program administrator(s) may be responsible for all aspects of the training program. The program administrator should also ensure a formal training plan [cf. DOE G 151.1-3, Chapter 2] is developed that describes program goals and objectives, organizational responsibilities, resources, and planned activities.

The administration of training and drills programs should include functions to:

- Ensure that a plan is developed and maintained describing and documenting the training and drills program.
- Ensure a comprehensive and coordinated program of training and drills for the identified ERO, both primary and alternate members.
- Establish training requirements for each position in the facility/site- or activity-specific ERO.
- Ensure a coordinated program for all responders, both initial training, and annual refresher training based on the plan and procedures for that emergency management program.
- Identify and coordinate adequate resources for training program implementation, including facilities, equipment, budget, etc.
- Ensure the integration of GET in the Base Program and training programs necessitated by the DOE/NNSA Hazardous Material Program.
- Ensure the training program adequately addresses each Response Element of the facility/site or activity emergency management programs.
- Ensure that the program plan provides for demonstrations of proficiency following training for ERO positions.

- Identify training needs and provide for development, scheduling and delivery of training activities.
- Establish qualifications for the training staff for each training module.
- Ensure that drills provide practical, hands-on training and use realistic situations and scenarios; ensure they are coordinated with site groups, such as Health Physicists, Industrial Hygienists, Medical, Public Affairs, Security, etc.

Exercises. Emergency management exercises are formal, evaluated demonstrations of the integrated response capabilities of an emergency management program. Exercises are conducted to validate the response program elements of an emergency management program. Exercises should be realistic simulations of potential facility/site or activity emergencies. They may vary significantly in size and complexity to achieve their respective purposes. Department of Homeland Security (DHS) exercise methodology refers to these evaluated demonstrations as *discussion-based* or *operations-based exercises* (cf. Chapter 3 of DOE G 151.1-3).

Exercise-specific objectives are used to establish the exercise scope, specify the emergency response functions to be demonstrated, identify the extent of organizations/personnel participating, and identify the breadth and depth of exercise activities to be accomplished or simulated. Typically, not all emergency management program elements are demonstrated in each exercise. The program administrator(s) ensures that a systematic approach is used, with emphasis on participation and coordination among the members of the EROs, to develop an exercise plan to ensure that all elements of facility/site and activity programs are exercised and validated over a multi-year period. Coordination of exercises is particularly important at sites with multiple, integrated facility emergency management programs, where response resources are shared, and efficiency in scheduling and conducting exercises is paramount.

The administration of exercise programs should include functions to:

- Ensure a formal exercise program to validate all response elements over a five-year period, in accordance with DOE O 151.1C.
- Ensure each exercise has specific objectives keyed to the emergency plan and procedures.
- Ensure that exercises are evaluated, including a critique process to gather and document observations of the participants.
- Ensure that a system is in place to track lessons-learned and corrective actions resulting from the evaluation of exercises.
- Ensure, at a minimum, the conduct of building evacuation exercises consistent with Federal regulations, local ordinances, or National Fire Protection Association (NFPA) Standards.

- Ensure tests of communications systems annually, or as often as needed, to ensure information can be efficiently exchanged with response organizations off site, and at DOE/NNSA field element and Headquarters (HQ)-levels.

1.4.2 Program Implementation

Training and Drills. The emergency management program administrator(s) has the responsibility for the conduct of the training program, including the scheduling of drills, based on the plans and procedures developed for the specific program. Administration of the training and drills program implementation should include functions to:

- Ensure training and periodic drills are scheduled, conducted, monitored, and documented.
- Ensure coordination of training and drills at sites with multiple facilities.
- Ensure auditable *training and drill records* are developed, maintained, and updated.
- Ensure a system is in place to track the development and implementation of *lessons-learned* from training and drills and promote program improvements.
- Conduct periodic (training program) self-assessments, including evaluating instruction and reviewing (training) materials.
- Ensure drills provide supervised, “hands-on” training for members of EROs.
- Ensure emergency preparedness training is provided to all workers who may be required to take protective actions.
- Ensure emergency-related training on facility/site conditions and hazards is made available/offered to *offsite response organizations* that may need to respond onsite.
- Maintain access to a qualified training staff.

Exercises. For effective conduct of the exercise program, the administrator(s) must ensure that:

- Each facility exercises its emergency response capability annually in a *facility operations-based exercise*.
- Each site exercises its site-level ERO elements and resources, as well as its integrated emergency response capability, at least annually in a *site operations-based exercise*. For multiple-facility sites, this site-wide exercise will be rotated among the facilities.
- Offsite response organizations are invited to participate in the annual site-wide exercise once every three years. Site-wide exercises that include offsite participation are referred to as *full-participation operations-based exercises*.

- The annual site-wide exercise is a *full-participation operations-based exercise* at least every third year, if offsite response organizations agree to participate.
- The evaluation of exercises conducted by the sites and facilities is accomplished by knowledgeable, independent organization(s) whose staff displays familiarity with responder organizations, functions, and procedures.
- Auditable *exercise records* are developed, maintained, and updated.
- Corrective actions items, identified as a result of the evaluation and critique process, are incorporated into the emergency management program.
- A system is in place to track the development and implementation of *lessons-learned* from exercises and promote program improvements.

1.4.3 Documentation

Training and Drills. The training program plan should be documented and training materials archived. Training and drill records enable the emergency management program administrator(s) to determine the types of training to be scheduled, the numbers of people to be trained, the specific individuals to be trained, and the type and quantity of resources that are needed to conduct the training and drills. Scores on training validation tests and performance during drills should also be recorded. The training records provide a means for verifying qualification requirements for ERO participation.

Lessons-learned from training and drill sessions are recorded and correlated with exercise evaluations, and other readiness assurance activities to determine additional training program needs.

Exercises. A complete, documented operations-based exercise package [i.e., an Exercise Plan (EXPLAN), as described in DOE G 151.1-3, Chapter 3] should be produced for each annual site-level exercise. Facility-level exercises can be accomplished with an exercise package that contains only the essential elements that are required to actually conduct the exercise. Exercise participation records enable the emergency management administrator(s) to ensure that individual members of the ERO are given the opportunity to demonstrate their proficiency annually. An exercise report [i.e., After Action Report (AAR)] should be produced following the exercise that provides an account of exercise control, player performance, and self-assessment evaluation findings.

1.4.4 Policy Issues

Training and Drills. Policy issues related to training and drills will focus on the adequacy of the training to prepare ERO members for their respective response tasks. The Order requires a coordinated program of training and drills for developing and maintaining ERO position skills, including initial and refresher training. The administrator(s) are responsible for ensuring that the training matches the skills required for the specific ERO positions.

Exercises. In addition to frequency requirements for conducting the exercises, the administrator must ensure that the scopes of facility- and site-level operations-based exercises match the intent of the Order. Also, the exercise program should include facilities participating in the site-level exercise on a rotating basis and all of the emergency management program elements validated over a multi-year basis.

1.5 Readiness Assurance Responsibilities

As indicated in the Order, emergency *readiness assurance* includes “. . . evaluations (assessments) and documentation to ensure stated emergency response capabilities are sufficient to implement emergency plans.” In the next three sections, the responsibilities of the program administrator(s) with respect to emergency readiness assurance activities will be divided according to the following topics: program plan, program implementation, and documentation.

1.5.1 Program Plan

Readiness assurance provides a framework and associated tools to assure emergency plans, implementing procedures and resources are sufficiently maintained, exercised and evaluated; and appropriate, timely improvements are made in response to identified needs. The framework consists of evaluations, improvements, and documentation. Emergency management administrator(s) should develop a readiness assurance plan that consists of evaluations (e.g., internal and external program evaluations, exercise evaluations, performance tests of single response tasks, tabletop tests of decision-making) and a real-time improvement system to ensure that findings from all evaluations (including *self-assessments*) result in corrective actions that are implemented in the program and are verified and validated. In addition, the administrator(s) should institute a lessons learned program to take advantage of lessons, not only from DOE/NNSA, but also from other Federal (e.g., DHS) and commercial activities performing similar tasks.

1.5.2 Program Implementation

To assure a quality emergency management program, persons with knowledge of the program or response activity being assessed should conduct an internal assessment of all aspects of a facility or site emergency management program annually. These assessments will be the basis for improvements, which should be integrated into the emergency management program. The site emergency management program administrator(s) should coordinate the scheduling of evaluations and assessments by external organizations to minimize impacts and maximize benefits. Evaluation schedules shall be forwarded to the Program Office and HQ Associate Administrator of Emergency Operations to ensure maximum coordination. The emergency management program administrator(s) should coordinate the response to emergency management evaluation findings.

The emergency management program administrator should maintain a root cause investigation and corrective action program that establishes and documents an integrated site program for corrective actions, including tracking corrective actions, and validating

the adequacy of corrective actions resulting from the annual assessments. The program should also include specific findings and lessons learned from training, drills, exercises, and particularly those from actual responses and self-assessments, even though such findings may not have the same visibility and urgency as those associated with external oversight. Site emergency management program administrators should maintain an open door policy for employee concerns regarding emergency management.

1.5.3 Documentation

The emergency management program administrator ensures the timely preparation of facility ERAP elements for inclusion in the site ERAP. The contributions to the site ERAP are made on an annual basis and reflect current and projected facility emergency management program capabilities, resources, and requirements (e.g., personnel, facilities, equipment, emergency planning and preparedness activities, etc.). Guidance on this topic may be found in DOE G 151.1-3, Appendix C.

Lessons learned from evaluations of exercises should be included with such records to enable facility emergency management program administrators to identify areas requiring additional training or that could require changes to the facility emergency plan and implementing procedures.

1.6 Response Responsibilities

The responsibilities of the program administrator(s) related to plans and procedures associated with emergency response have been covered in Section 1.4. However, associated with several of the response emergency management program elements are functions/activities that must be maintained on a regular or periodic basis in order to be ready in the event of an OE. The program administrator(s) must ensure that these functions are performed regularly. DOE G 151.1-4 contains guidance related to all of the response program elements, and, in particular, descriptions of the associated programmatic functions. These response-related programmatic functions/activities are identified and associated documentation requirements are indicated in the following sections.

1.6.1 Programmatic Activities

ERO. An adequate number of fully trained personnel, with periodic participation in an exercise, an evaluated drill, or an actual response, are assigned to facility- and site-level ERO positions to ensure adequate staffing for emergency response. The standby staffing of ERO emergency facility positions and response teams is effectively accomplished. ERO rosters are periodically reviewed for accuracy (e.g., current qualifications, correct phone number, correct response time, etc.) Communication systems used to activate both on shift and off shift emergency response personnel are periodically tested.

Offsite Interfaces. The emergency management program administrator(s) should meet with local emergency planning officials at least annually and upon significant program change to ensure their collective understanding of the site emergency plan and emergency

plan implementing procedures. This should occur as the documents affecting their roles, responsibilities, and activities change or require greater emphasis or attention, particularly in the area of emergency categories, classifications, notifications, and protective action recommendations.

The program administrator(s) is also responsible for the development, review, and update of facility/site-specific mutual aid agreements/memoranda of agreement/memoranda of understanding (MAAs/MOAs/MOUs) relevant to a comprehensive and effective emergency management program. These MAAs/MOAs/MOUs routinely involve support provided to and/or from offsite organizations or, on a multiple-facility site, support provided to and/or from other facilities, contractors, and/or offsite organizations. On a multiple-facility site, MAAs/MOAs/MOUs with offsite organizations should be developed, maintained, and updated by the site emergency management program administrator and are typically maintained as a part of the site emergency plan. There are DOE/NNSA locations where DOE/NNSA retains full responsibility for development and maintenance of agreements with offsite organizations.

Organizations which may be needed in a supporting role and/or needed for long-term support have been identified and pre-designated offsite points-of-contact, including organization, names, and telephone numbers, are documented, maintained, and available to the response organization. Planned response functions to be provided by offsite organizations are periodically tested and verified.

Emergency Facilities and Equipment. Designated response facilities, especially multi-use facilities, are adequately maintained. Inventories of all emergency equipment and supplies are maintained in identified locations. Periodic inspections, operational checks, calibration, preventive maintenance and testing of equipment and supplies are carried out as required.

Categorization and Classification. Emergency Action Level (EAL) sets are reviewed and tested regularly against a range of initiating conditions and emergency event/condition scenarios.

Consequence Assessment. A formal Quality Assurance Program is implemented and maintained for control of the tools used in consequence assessment.

Emergency Medical Support. Arrangements with offsite medical facilities to transport, accept, and treat contaminated, injured personnel are established, documented, and periodically reviewed. Onsite and offsite medical personnel are periodically offered information and training on facility/site-specific hazardous materials and offered opportunities for participation in drills and exercises.

Emergency Public Information. Workers and site personnel are informed of emergency response plans, response capabilities, and planned protective actions. Information is disseminated periodically to the public regarding facility hazards, how they will be alerted and notified of an emergency, what their actions should be in the event of an emergency, and points of contact for additional information. Continuing

education is provided to the area news media for the purpose of acquainting the media with the facility, management personnel, facility hazards, emergency plans, and points of contact. A list of 24-hour media points-of-contact is available and maintained current.

1.6.2 Documentation

Written MAAs/MOAs/MOUs should be developed to ensure that the provision of support during an exercise and an actual emergency is not dependent on the presence of specific individuals. MAAs/MOAs/MOUs may be mutual aid or support agreements between onsite and offsite response organizations or may require Departmental elements or contractor organizations to provide specific capabilities, training, and/or information in exchange for assistance from offsite organizations.

Copies of supporting MAAs/MOAs/MOUs between Departmental entities and Tribal, State, and local governments or response organizations should be maintained as an appendix to the emergency plan. If the potential release of phone numbers and radio call information is of concern, a table listing just the MOAs/MAAs/MOUs with renewal dates can be included in the emergency plan.

1.7 Document Control

The volume of information and documents that support and define an emergency management program, together with supporting technical information and reports, represents a significant challenge to emergency management program administration. A reliable document control system for document review, approval, distribution, and change control should be established, where none exists, or emergency management documents should be controlled under an existing site-wide document control system. The following list represents some of the documents that should be managed under a document control system:

- Technical Supporting Information (e.g., diagrams, illustrations, maps, reference documents, and technical documents, such as risk assessments and Material Safety Data Sheets)
- Emergency Management Documents (e.g., facility/site Hazards Surveys and/or EPHAs, Plans and Procedures, Emergency Planning Zone (EPZ) documentation, all MOU, MOA, MAA, and all other documents required by Orders or other applicable laws or regulations)
- Auditable Program Records (e.g., complete training and drill records; exercise records, including participation and evaluation reports; program assessment and evaluation reports; and records resulting from actual emergencies; corrective actions and associated closure verification/validation records)

The program administrator(s) must determine the appropriate controls to be placed on each document, based on the need for review, approval, distribution, and change control. No specific document control system is required, but the system should “meet industry

standards.” It also includes ensuring the availability of vital records essential for the continued functioning, operation, or reconstitution of a site organization/activity during or after an emergency [e.g., continuity of operations (COOP)]. DOE/NNSA encourages the program administrator(s) to make maximal use of technological tools, such as the Internet, to increase document and information availability. However, the availability of sensitive, unclassified [e.g., Official Use Only (OUO)] facility/site documents containing information that could be exploited by malevolent interests (e.g., EPHAs, facility/site diagrams and maps) must be secured following DOE/NNSA guidelines.

The program administrator(s) ensures that adequate documentation of all technical data which supports the emergency management program is maintained, kept current using both hard copy and electronic media where possible, and shared with those who require access to it. The program administrator(s) should ensure that up-to-date and controlled, if appropriate, copies are maintained, information is properly distributed and/or made available or accessible, documents are updated when needed or required, and required supporting information is maintained. This enables the emergency management program administrator(s) to ensure that changes and updates are distributed to all organizations using and/or maintaining these documents. Copies of such documents maintained on electronic media should be read-only, access-controlled; the specific procedures used to address access to these electronic media files should be determined by the respective facility and/or site. At the same time, the emergency management program administrator(s) must ensure that Federal and Departmental security regulations and guidance associated with sharing such information and documents are being met and/or complied with.

1.8 Classified/Sensitive Information

If classified and/or sensitive information or materials are being used or generated at/by a facility or site, the emergency management program administrator(s) is responsible for ensuring that required security procedures and controls are incorporated at the appropriate facility and/or site levels. This also includes ensuring that required security reviews are conducted, documented, and lessons learned implemented. The administrator also ensures that a Derivative Classifier (DC) or an Unclassified Controlled Nuclear Information (UCNI) reviewing official reviews emergency management documents [e.g., plans and procedures, Hazards Surveys/EPHAs (especially location and quantity of nuclear materials and malevolent event scenarios), and supporting program documentation].

APPENDIX A. Standard Format and Content of Emergency Plans for Hazardous Material Programs

A.1 Introduction

Emergency management programs for each DOE/NNSA facility/site and activity are documented in an emergency plan. The plan describes provisions for response to Operational Emergencies and activities for maintaining the emergency management program. The recommended emergency plan format and content for Operational Emergency Hazardous Material Programs is provided in this chapter. The requirements for Base Programs and Hazardous Material Programs should be seamlessly integrated into one Emergency Plan for the facility or site with hazardous materials that require a more substantial level of planning and response capabilities. Section A.2 addresses the format and content of the Hazardous Material Program emergency plan.

A.2 Emergency Plan

This section provides a candidate format and associated content for the Hazardous Material Program Emergency Plan. **Figure A-1** contains a recommended format for the emergency plan. Specific content for each section in the plan follows.

EXECUTIVE SUMMARY

Summarize the Emergency Plan by briefly stating its purpose and a description of what is included in each chapter.

TABLE OF CONTENTS

See Figure A-1.

EXECUTIVE SUMMARY	
TABLE OF CONTENTS	
1.	INTRODUCTION
1.1	Purpose of Emergency Plan
1.2	Scope
1.3	Concept of Operation
1.4	Site Description
2.	EMERGENCY RESPONSE ORGANIZATION (INTERNAL)
2.1	Organization Structure
2.2	Emergency Direction and Control
2.3	Emergency Management Operations
3.	OFFSITE RESPONSE INTERFACES
3.1	Overview
3.2	Other Federal Agencies
3.3	Tribal Organizations
3.4	State Government
3.5	Local Organizations
3.6	Private Organizations
3.7	Mutual Aid Agreements (MAAs), Memoranda of Agreement (MOAs), and Memoranda of Understanding (MOUs)
3.8	Offsite Medical Facilities
4.	EMERGENCY FACILITIES AND EQUIPMENT
4.1	Emergency Facilities
4.2	Emergency Equipment
5.	EMERGENCY CATEGORIZATION AND CLASSIFICATION
5.1	Definitions
5.2	Criteria for Operational Emergencies Not Requiring Classification
5.3	Emergency Action Levels (EALs)
6.	NOTIFICATIONS AND COMMUNICATIONS
6.1	Notifications
6.2	Communications
7.	CONSEQUENCE ASSESSMENT
7.1	Consequence Determination
7.2	Coordination
8.	PROTECTIVE ACTIONS AND REENTRY
8.1	Protective Action Criteria (PACs)
8.2	Records
8.3	Protective Actions
8.4	Reentry
8.5	Emergency Planning Zones (EPZs)
8.6	Communication
8.7	Termination of Protective Actions
8.8	Shutdown of Operations

Figure A-1. Recommended Format for Operational Emergency Hazardous Material Program Emergency Plan

- 9. EMERGENCY MEDICAL SUPPORT
 - 9.1 System
 - 9.2 Staff
 - 9.3 Equipment
 - 9.4 Transportation and Evacuation
 - 9.5 Communications
 - 10. TERMINATION, AND RECOVERY
 - 10.1 Emergency Termination
 - 10.2 Recovery
 - 11. EMERGENCY PUBLIC INFORMATION
 - 11.1 Public Information Organization
 - 11.2 Public Information Facilities
 - 11.3 Public Education
 - 11.4 Public Inquiries
 - 11.5 Security
 - 11.6 Field and Headquarters Coordination
 - 12. PROGRAM ADMINISTRATION
 - 12.1 Emergency Management Program Administrator
 - 12.2 Document Control
 - 13. TRAINING AND DRILLS
 - 13.1 Courses
 - 13.2 Training, Certification, and Proficiency Requirements
 - 13.3 Examinations
 - 13.4 Record Keeping
 - 13.5 Offsite Personnel
 - 13.6 Offsite Training Support
 - 13.7 Offsite Personnel Training
 - 13.8 Instructor Training and Qualification
 - 13.9 Drills
 - 14. EXERCISES
 - 14.1 Exercises
 - 14.2 Offsite Coordination
 - 15. READINESS ASSURANCE
 - 15.1 Self-Assessment
 - 15.2 Corrective Action Program
 - 15.3 Lessons-Learned Program
- Appendixes
- List of Figures
 - List of Tables
 - List of Acronyms
 - List of Definitions
 - Agreements
 - Maps
 - Listing of Emergency Management Personnel
 - References

Figure A-1. Recommended Format for Operational Emergency Hazardous Material Program Emergency Plan (cont'd)

1. INTRODUCTION

1.1 Purpose of Emergency Plan

State that the purpose of this Emergency Plan is to provide the Departmental community with an effective and efficient emergency management operation that will provide acceptable levels of protection. For example, the Emergency Plan provides an efficient and effective response operation that, should an emergency occur, will protect the health and safety of workers, responders, the public, and the environment. Identify the Departmental Orders and legislation that require this plan and that this Emergency Plan satisfies. Describe the operational use of the Emergency Plan and Emergency Plan Implementing Procedures (EPIPs).

1.1.1 Update of Emergency Plan

State the process and time table for Emergency Plan updates, including required periodic updates and updates made necessary by changes in emergency planning or facility operations and/or hazards.

1.1.2 Distribution of Copies

Identify which organizations, Departmental and non-Departmental, are to receive copies of the Emergency Plan.

1.2 Scope

Identify the types of emergencies, per DOE O 151.1C, to which this Emergency Plan applies and does not apply. (Emergency Plans generally are for Operational Emergencies and not Energy or Emergency Assistance emergencies.) Identify the boundaries and define the site to which this Emergency Plan applies (i.e., site emergency plan versus building or facility Emergency Plan).

1.3 Concept of Operations

Describe the concept on which site-wide emergency planning is based. Identify the documents, reports, surveys, and assessments used to develop this Emergency Plan, or refer to where this information can be found in the Emergency Plan.

1.4 Site Description

1.4.1 Overview Site Description

Identify the overall function and mission of the site. Broadly describe the site and the buildings and facilities within the site. Use maps and other graphics/diagrams as appropriate to describe the site. Do not use classified information.

1.4.1.1 Detailed Facility Description

In detail, describe the specific facilities that, by the nature of the hazards present on those facilities, could cause an emergency to be declared. Do not use classified information in the facility description. Identify the maximum number of employees in each facility described. Provide facility floor plans where appropriate.

1.4.1.2 Hazard Survey and Hazards Assessment

A Hazards Survey shall be used by the site, facility, or activity Emergency Manager to identify the planning requirements addressed in the Operational Emergency Base Program. A Departmental site, facility or activity may then be required to establish and maintain a quantitative Emergency Planning Hazards Assessment (EPHA). The quantitative EPHA analyzes hazards significant enough to warrant consideration in a facility/site or activity Operational Emergency Hazardous Material Program.

Include or summarize the results of the Hazards Survey. Describe known hazards originating outside the Departmental facility that could impact the health and safety of onsite personnel or other Departmental interests.

List and/or summarize the significant radiological and non-radiological hazards present. Describe the system for updating the EPHA. The EPHA may be included as a separate appendix, if desired or necessary for completeness. Identify technical supporting documents that describe the methodology and information of EPHAs used as the bases for emergency planning. Describe the hazards associated with leased facilities (if applicable).

1.4.1.3 Contractors

Identify the major contractors and their contractual commitments and responsibilities.

1.4.1.4 Leased Facilities on Site (if applicable)

Identify facilities onsite that are leased to others, including contractual arrangements and agreements. Identify emergency management agreements and interfaces with the site emergency management program.

1.4.2 Physical Attributes of the Site

1.4.2.1 Geography

Identify the state, county, and any other appropriate local subdivision in which the site is located. Discuss the site location with respect to prominent natural and man-made features such as rivers, lakes, or dams. Describe land use of

surrounding area. Discuss any groundwater features. Identify other vital features, such as fault lines or flood plains.

1.4.2.2 Topography and Geology

Briefly describe the terrain of the site and the surrounding area, including ground cover and elevations. Describe the geology of the site and the surrounding area, particularly as it relates to possible seismic activity.

1.4.2.3 Population Distribution

Describe the surrounding area (offsite) population, including population density. Provide maps identifying potentially affected onsite population groupings and, based on the most recent census information available, offsite populations to distances of 10 and 50 miles from the site boundary. Discuss projected population growth or change trends and the basis for these projections.

1.4.2.4 Meteorology

Briefly describe the general climate of the region, including types of air masses, synoptic features (high- and low-pressure systems and frontal systems), general airflow patterns, temperature and humidity, precipitation, and relationships between synoptic-scale atmospheric processes and local meteorological conditions.

1.4.2.5 Natural Phenomena

Describe seasonal and annual frequencies of severe weather phenomena, including hurricanes, tornadoes, and waterspouts, thunderstorms, lightning, hail, severe drought, and high air pollution potential. Describe the potential for earthquakes and floods.

1.4.2.6 Transportation System

Describe major public and private transportation systems used by employees and the surrounding public. This includes waterways, airports, rail systems; major highways located on, through, and near the site and major local access routes. Describe any transportation systems operated within the site. Describe any transportation interfaces required for site evacuations.

1.4.2.7 Utility System

Describe the public and private utility systems used by the site that would be affected by an actual emergency or declaration of an emergency. Describe how the utilities would be affected and the effect on the surrounding population. Identify and describe any back-up utility systems present and the plan for their use.

2. EMERGENCY RESPONSE ORGANIZATION (INTERNAL)

2.1 Organization Structure

Generally describe the overall organizational structure of the site and describe in detail the emergency response organization, including its relationship to the overall structure. Figures, diagrams, and organization charts may be used to show lines of authority between the various government officials, the emergency manager, and heads of various departments. Specifically delineate the functions, authorities, and responsibilities of all internal organizational elements with emergency responsibilities. Outline the relationship of all emergency organizations to each other, with Departmental (field and Headquarters) and other Federal, Tribal, state, and local organizations.

List all committees with emergency management or emergency planning roles and responsibilities. Describe the purpose and make-up of each committee. Include both onsite and offsite committees in which employees serve either as a working member, a participant, or an observer. List the members, the authority and responsibility of each committee, and the authority and position of each member. Identify the meeting frequency and any other pertinent details to describe the committee.

2.2 Emergency Direction and Control

Delineate the site chain of command in the event of an emergency. Discuss the organizational structure, authorities and responsibilities, and roles played by each position. Include an organization chart specifying, at a minimum, the positions responsible for emergency direction and control, both during routine operations and emergency conditions. Identify the succession of authority for emergency positions.

2.3 Emergency Management Operations

Describe the actions and activity for the following:

- Declaration of an Operational Emergency
- Activation of the command center or Emergency Operations Center (EOC)
- Emergency response
- Reentry
- Emergency termination

The actions describing the activation of the command center or EOC include the time required for staffing (during both normal duty hours and non-duty hours) and the minimum positions required for activation. Note that this section is not intended to include detailed emergency procedures, which are contained in separate implementing procedures. Describe each position's emergency management responsibilities, its place in the overall organization, and the authority and responsibility of each position.

3. OFFSITE RESPONSE INTERFACES

3.1 Overview

Provide an overview of relationships, both formal and informal, with offsite organizations, including other Departmental elements and other Federal government, Tribal, state, and local organizations with emergency management or emergency planning responsibilities. MAAs, MOAs, and MOUs should be described in this section.

3.2 Other Federal Agencies

Describe agreements with other Federal agencies, specifying the role of the agency, potential response, regulatory control, and notification chain required. Discuss the relationship of the organization in the activation of the National Response Plan (NRP) and its role in the National Incident Management System (NIMS). Examples of Federal agencies that may be involved in a Departmental response are as follows:

- Department of Defense
- Defense Threat Reduction Agency
- Department of Homeland Security
- U.S. Forest Service
- Federal Bureau of Investigation
- Federal Aviation Administration
- U.S. Coast Guard
- U.S. Environmental Protection Agency
- Nuclear Regulatory Commission
- National Oceanic and Atmospheric Administration

3.3 Tribal Organizations

Describe the roles of Tribal organizations with emergency response or regulatory control responsibilities relevant to Departmental facilities and/or sites. Summarize primary and secondary support roles. Describe Tribal emergency plans or procedures that affect the Departmental facility or program. Specify the nature of any MAAs, MOAs, or MOUs with the local tribal organizations.

3.4 State Government

Describe the roles of state organizations with emergency response or regulatory control responsibilities relevant to Departmental facilities and/or sites. Summarize primary and secondary support roles. Describe emergency plans or procedures with impact upon the Departmental facility or program. Specify the nature of any MAAs, MOAs, or MOUs with the State.

3.5 Local Organizations

Describe the roles of local organizations with emergency response or regulatory control duties as they pertain to Departmental facilities and/or sites. Summarize primary and secondary support roles. Describe local emergency plans or procedures that affect the Departmental facility or program. Specify the nature of any MAAs, MOAs, or MOUs with the local authorities.

3.6 Private Organizations

Describe the roles of private organizations with emergency response responsibilities relevant to Departmental facilities and/or sites. Summarize primary and secondary support roles. Describe private emergency plans or procedures that affect the Departmental facility or program. Specify the nature of any MOAs or MOUs with the local private organizations. Describe any contractual arrangements and annual funding obligations in order to maintain the desired level of emergency preparedness.

3.7 MAAs, MOAs, and MOUs

List all MAAs, MOAs, and MOUs with offsite organizations. Include in the list the parties to the agreement, points of contact, the date of the agreement, and the expiration date of the agreement. Identify all organization(s) responsible for negotiating, executing, and maintaining agreements. Specify where documents are on file, and include copies of the unclassified MAAs, MOAs, and MOUs in an appendix to this Emergency Plan. List all classified MAAs, MOAs, and MOUs, identify unclassified points of contact, and state where the agreement can be viewed.

3.8 Offsite Medical Facilities

Discuss capabilities of local medical centers to support mass casualties and contamination events.

4. EMERGENCY FACILITIES AND EQUIPMENT

4.1 Emergency Facilities

List and provide a brief description of the following facilities. Distinguish between dedicated and non-dedicated facilities. Maps and floor plans of facilities should be included when a complete description of the facility will be useful in a response.

4.1.1 EOC or Command Center

4.1.2 Alternate or Secondary EOC

4.1.3 Emergency Response Facilities

- 4.1.4 Technical Support Center**
- 4.1.5 Primary and Alternate Onsite JIC**
- 4.1.6 Offsite Communications Center**
- 4.1.7 Decontamination Facilities**
- 4.1.8 Medical Facilities**
- 4.1.9 Security Control Centers**

4.2 Emergency Equipment

List and describe the equipment likely to be used for responding to emergencies. Include in the list: equipment capability and limitations, quantity of equipment, locations (both fixed and portable equipment), consumables, maintenance requirements, certification requirements, expiration dates, and computer/communications compatibilities.

- 4.2.1 Communications Equipment**
- 4.2.2 Heavy Construction Equipment**
- 4.2.3 Decontamination Equipment**
- 4.2.4 Alarm Equipment**
- 4.2.5 Rescue Team Equipment**
- 4.2.6 Sanitation and Survival Equipment**
- 4.2.7 Transportation Equipment**
- 4.2.8 Personnel Protection Equipment**
- 4.2.9 Gas and Liquid Monitoring Equipment**
- 4.2.10 Damage Control Equipment**
- 4.2.11 Fire Fighting Equipment**
- 4.2.12 Emergency Power Equipment**
- 4.2.13 Logistics Support Equipment (maps, plans, etc.)**

5. EMERGENCY CATEGORIZATION AND CLASSIFICATIONS

5.1 Definitions

State the definitions of Operational Emergencies and emergency classes per DOE O 151.1C. In the interest of consistency, the definitions as provided in the Departmental Orders can be repeated.

5.2 Criteria for Operational Emergencies Not Requiring Classification

State the criteria used to define an emergency. Briefly describe the methodologies used to develop criteria and reference specific technical supporting documents.

5.3 Emergency Action Levels (EALs)

Identify the EALs used to define an emergency. Briefly describe the methodologies used to develop EALs and reference technical supporting documents. The EALs should be described for all potential emergencies at the facility or site, including radiological, non-radiological, terrorism, sabotage, fire, explosion, security, and natural phenomena. Describe the criteria for each classification of emergency at the facility or site. Identify personnel (positions) responsible for determining the classification and action level. Discuss the level of emergency staffing required at each level. Describe how the EALs are incorporated into and integrated with the facility procedures that govern response to alarms and/or abnormal events. Identify where the complete EALs are kept on file.

6. NOTIFICATIONS AND COMMUNICATIONS

6.1 Notifications

Discuss the required and proceduralized notification process for onsite and offsite notifications for all operational emergencies. Specify time limits in which notifications are required, and the authority for the time limit. Identify personnel (positions) responsible for both initiating and receiving notifications. Discuss the method of notification (e.g., beepers, telephone). Discuss notification procedure for termination of an incident. Discuss the procedure variance for classified notifications. Include copies of all notification record forms, particularly those forms used in response to DOE O 231.1A and its successors.

6.1.1 Offsite Notifications

Identify the applicable requirements for notification and communication with appropriate offsite agencies and organizations, including, at a minimum, Tribal government; state government; local government; local fire, police, and medical organizations; private organizations; contractor organizations; other Federal

agencies; and any organization for which an agreement of notification has been signed.

6.1.2 Onsite Notifications

Identify personnel (positions) required to be notified for any emergency, specifying any differences for day shift or night shift. Discuss, if appropriate, the Duty Officer Program and specific responsibilities.

6.1.3 Departmental Radiological Emergency Response Assets

Identify the notification procedure for requesting Departmental radiological emergency response assets, and the specific circumstances under which notification is permitted or required.

6.1.4 Field EOC and Headquarters Operations Center Notifications

Identify the circumstances under which the operations/field/site EOCs and/or the Headquarters Operations Center are notified of an emergency and describe the procedures for notification, including the responsible personnel.

6.2 Communications

Describe the communications systems and equipment employed by emergency personnel at the site or any specific facility for any notifications, sirens, or warnings to the public, including a description of primary and alternate systems. Discuss communications interface with offsite organizations; describe the integration of the site's communications with offsite response resources, such as the police, fire and offsite EROs.

Identify what portions of the system are dedicated to the Emergency Management System. Describe the equipment, back-up equipment, readiness assurance, and testing procedures. Describe the troubleshooting system for ensuring that problems noted during tests and drills are identified, tracked, and resolved. Reference to any listing of communication equipment in the Emergency Equipment chapter is acceptable. Describe the procedures and plans for communicating classified information.

7. CONSEQUENCE ASSESSMENT

7.1 Consequence Determination

Describe the procedure(s) used to determine the potential consequences based on the results of hazard assessments and input from all other pertinent areas, such as intelligence and meteorological information. Describe the methodologies used for consequence assessment and reference technical supporting documentation.

Describe the expected utilization of the National Atmospheric Release Advisory Center (NARAC) capabilities during a response. Describe the procedures for continually (and in real time, where appropriate) monitoring an emergency or a continuing situation to update the consequence assessment. Describe the processes for initiating and performing field monitoring for both radiological and chemical releases. When appropriate, include a discussion of any special circumstances associated with coordination and execution of offsite field monitoring.

7.2 Coordination

Describe the procedure to coordinate with other Federal, Tribal, State, and local organizations information necessary to make accurate and timely consequence determinations.

8. PROTECTIVE ACTIONS AND REENTRY

Identify the purpose and intended use of protective actions. Describe protective actions used at the facility/site or activity and under what circumstances they are implemented.

8.1 Protective Action Criteria (PACs)

8.1.1 Radiological PACs. List and summarize existing radiological Protective Action Guides (PAGs). Reference applicable supporting technical documentation.

8.1.2 Chemical PACs. List the AEGL/ERPG/TEEL used for chemicals involved in potential Operational Emergencies. Reference applicable supporting technical documentation.

8.2 Records

Describe the procedures and the responsible organization tasked with maintaining an accurate log of the events of the emergency, including all follow-up health and hygiene surveys. Describe the coordination procedures with medical personnel and facilities. Identify the length of time and method of storing the records.

8.3 Protective Actions

Present the assumptions for the development of protective actions for both offsite and onsite populations. Discuss what constitutes potential protective actions at the site, such as sheltering-in-place, monitoring activities, and accounting of personnel. Discuss the process for implementing the protective actions. Discuss the procedures for ensuring that the protective actions are timely, communicated, safe, and complete. Identify the notification process and responsibilities.

Describe the considerations used to determine whether shelter-in-place or evacuation is appropriate. Identify the notification process and responsibilities.

Discuss conditions requiring shelter-in-place. Discuss the method(s) for implementing shelter-in-place and for accounting for personnel. Identify the location of shelters.

Discuss conditions requiring evacuation (full or partial). Identify onsite evacuation routes and include maps. Discuss the method for collecting and housing the evacuated individuals. Describe access control procedures for evacuated areas. Discuss the method and procedures for accountability of onsite personnel and visitors.

8.4 Reentry

Describe the plan and criteria for reentry at each facility, where applicable, for the entire site, and identify all reentry plans. Identify and discuss, where appropriate, the criteria for reentering areas under emergency conditions or which had restricted access during the emergency. Describe the procedure used to assess damage and/or contamination. Identify personnel who develop, approve, or implement reentry and indicate their relationship to the emergency organization. The reentry plan shall also include: methods for protection of workers from hazardous exposure, exposure guides for rescue personnel, facility accessibility, security considerations, access to protective clothing and equipment, availability of medical assistance, and debriefing procedures. Provide references to technical supporting documentation if applicable. Note that some activities of reentry may be relevant to recovery.

8.5 Emergency Planning Zones (EPZs)

Describe the procedures and/or the predetermined emergency planning zones in determining potentially affected areas. Use maps, as appropriate, for an accurate and complete description. Identify the persons (positions) responsible for determining and recommending protective actions for the public within the plume exposure EPZ and receiving protective action recommendations from the site.

Specify the evacuation routes to be used in an emergency. Discuss sheltering and evacuation plans for the EPZ. Define the size of the plume EPZ limit, specifically noting what portions of the EPZs fall onsite and offsite. Describe the exposure pathways. Describe conditions, procedures, and authorities for evacuation of local populations.

Describe the ingestion pathway planning zone. Identify the persons (positions) responsible for determining and recommending protective actions for the public within the ingestion pathway planning zone.

8.6 Communication

Describe the communications to notify other Federal, Tribal, State, local, and private organizations of necessary actions required for their protection or for

which they are responsible for informing the public or otherwise need to take action. Define and list, if necessary, sources of information used by Federal, Tribal, State, and local organizations in further determining their course of action.

8.7 Termination of Protective Actions

Describe how protective actions are lifted or modified, the authorities for removal of protective actions, how this information is communicated, both onsite and offsite, and how the activity is accomplished. Describe any post-emergency communications or follow-up actions.

8.8 Shutdown of Operations

Describe the system to ensure safe shutdown of facility and/or site operations following the declaration of an emergency.

9. EMERGENCY MEDICAL SUPPORT

Describe the medical capabilities available onsite and offsite to respond to an emergency.

9.1 System

Describe the onsite medical care organization responsible for medical care for managing injured and/or contaminated personnel. Describe the onsite medical care capabilities and facilities. Discuss roles, responsibilities, and procedures for treatment of radiological and chemical exposures (e.g., radiological prophylaxis). Describe the provisions in place to ensure coordination among onsite medical, industrial hygiene, health physics, environmental response, security, and management personnel during emergencies.

9.2 Staff

Identify the lead medical emergency director. Describe the staff available both permanently and on call, outlining qualifications and training required. Identify the minimum requirements for offsite medical assistance including contractual arrangements and offsite staff training requirements.

9.3 Equipment

Describe the health services available onsite and offsite for response to emergencies. Describe the equipment available for extrication, rescue, and transport of injured personnel. Describe the onsite facilities and equipment for decontamination of injured personnel. Describe the equipment available for bioassay and whole body counting. Identify the types of medical supplies maintained onsite and any special equipment maintained offsite for emergencies. Describe how the quality and quantity of these supplies are determined, maintained, and ensured.

9.4 Transportation and Evacuation

Describe the transportation and evacuation capabilities, equipment, and process for moving contaminated and uncontaminated casualties. Identify person/positions with responsibility and authority for evacuation of injured or ill personnel.

9.5 Communications

Describe the communications procedures in place for emergencies. Identify the persons/positions responsible for notifying emergency medical teams, security, administration, offsite hospital and offsite emergency services.

10. EMERGENCY PUBLIC INFORMATION

Describe the program to provide information concerning the emergency to the media and the general public, including information release approval. Identify the recommended time requirements for information release.

10.1 Emergency Public Information (EPI) Organization

Describe the organization, including the relationship to the overall emergency organization, which will be used to disseminate information to the media and the general public. Identify the personnel within the Public Information Office who are authorized to release information (e.g., to employees and their families, media, and the public), including the designated spokesperson.

10.2 Public Information Facilities

Describe the facilities and communications equipment used to disseminate information to the public. Include meeting rooms, press areas, and communications facilities. Describe the function and staffing of the Joint Information Center (JIC). Discuss the coordination roles at the JIC (both onsite and offsite).

10.3 Public Education

Describe the public education program and methodology for informing workers and the public of potential hazards at DOE/NNSA sites and providing information on emergency plans and protective actions before and during emergencies as well as how they will be notified of the protective actions, including recommended evacuation routes and sheltering.

10.4 Public Inquiries

Describe the plan to respond to public and worker inquiries, including rumor control.

10.5 Security

Describe the plan to ensure that security is not being compromised with the release of sensitive or classified information to the public.

10.6 Field and Headquarters Coordination

Describe the plan to coordinate with the operations/field/site office and Headquarters on the release of information to the public.

11. TERMINATION AND RECOVERY

Describe the plan and criteria for declaring the emergency condition terminated and transitioning to recovery at each facility, where applicable, and for the entire site, and identify all termination and recovery plans. The plan includes termination authority and responsibility and recovery criteria for protection of workers and the general public from hazardous exposure, exposure guides for recovery personnel, facility accessibility, security considerations, access to protective clothing and equipment, availability of medical assistance, and requirements for establishing the recovery organization. Provide references to technical supporting documentation if applicable.

11.1 Emergency Termination

Describe the procedures for terminating the state of emergency, including the personnel responsible for decision-making and their relationship to the overall emergency organization described in Chapter 2 of the emergency plan. Address the special circumstances of an error in initial categorization that necessitate an emergency downgrade. Describe the conditions or identify the document under which the emergency may be terminated and initiation of recovery activities may occur.

11.2 Recovery

Describe the recovery (transition) process from an emergency condition to the restoration of a safe, pre-emergency environment. Discuss the plan to restore vital systems, such as power, water, and communications. Include a discussion of the areas that must be verified for safety, such as fire hazards, toxic gas, and radiation. Describe the measures taken to ensure that security procedures are maintained. Describe the continued recovery (transition) process from a safe environment to the pre-emergency conditions.

Describe the recovery organization and the authority and responsibility of the chain of command that restores pre-emergency conditions. Describe how this organization may differ from the emergency organization described in Chapter 2. Describe the plan, either here or in Chapter 10, to notify the media and the public about the conditions of emergency recovery.

12. PROGRAM ADMINISTRATION**12.1 Emergency Management Program Administrator**

Provide the name, position, mailing address, and telephone number of the Emergency Management Program Administrator at the facility and/or site level. (This information should also be provided in the appendix that lists the emergency management personnel.) Indicate, where appropriate, whether the Emergency Management Program Administrator has been given emergency management responsibility through delegation of authority.

12.2 Document Control

Identify the procedure used to control dissemination of or access to the facility or site Emergency Plan and to assure its annual review and update.

13. TRAINING AND DRILLS

Describe the goals and objectives of the facility and/or site training and drills program. Describe the overall approach to the design of the training and drill program, including training analysis methodology, overall curriculum design, and qualifications.

13.1 Courses

List the available courses for emergency response planning, preparedness, and analysis, including title, length of course, target audience, a brief summary, and the periodicity or schedule.

13.2 Training, Certification, and/or Proficiency Requirements

Describe courses given to emergency management personnel. Identify training, certification, and/or proficiency requirements for key emergency management positions and response teams. Identify periodicity of courses and employee requirement for training and retraining or refresher training.

13.3 Examinations

Describe the examinations, if any, required for emergency response organization personnel qualification and/or certification and for documenting individual and team proficiency.

13.4 Record Keeping

Describe the system of record keeping for verifying that training and proficiency requirements are met.

13.5 Training for Onsite Public

Describe the system of training available to and required for visitors, vendors, and subcontractors.

13.6 Offsite Training Support

Describe the available offsite training resources available to onsite emergency response organization personnel, which can substitute for or complement existing onsite training courses and/or meet training, certification, and/or proficiency requirements.

13.7 Offsite Personnel Training

Describe the in-house training available to offsite organizations in order to support their abilities to participate in site emergency response actions. Describe training available, if any, for the general public. Describe procedures for documenting attendance of offsite personnel at training.

13.8 Instructor Training and Qualification

Describe the plan to provide qualified instructors for the onsite training available to emergency response organization personnel and the required qualifications of such instructors, including training courses for instructors.

13.9 Drills

Describe the drill program, per DOE O 151.1C, including the goals, frequency, complexity, and integration of lessons learned into emergency planning. Describe how the drills develop expertise and proficiency in performing emergency activities such as notification, communication, fire control, medical planning, and Hazardous Materials (HAZMAT) response. Describe how drills will be controlled and evaluated, and how lessons learned from drills, improvements, and/or corrective actions, are incorporated into emergency planning.

14. EXERCISES

Discuss the intended purpose of the exercise program.

14.1 Exercises

Describe the emergency management exercise program and how it conforms to the requirements of DOE O 151.1C and any other applicable Federal, State, and local legislative-based regulation. Describe how exercises will be controlled and evaluated and how lessons learned from exercises (improvements and/or corrective actions) are incorporated into emergency planning.

14.2 Offsite Coordination

Describe the method of coordination with Headquarters and participating Federal, Tribal, State, local, and private organizations for drill or exercise planning, and the level of participation.

15. READINESS ASSURANCE

Describe the procedures for developing a structured readiness assessment program, including program and exercise evaluations (e.g., self-assessments, external evaluations, performance indicators).

15.1 Self-Assessment

Describe the site internal assessment program, which requires an internal assessment to be conducted annually.

15.2 Corrective Action Program

Describe site validation and verification procedures for Corrective Actions and the tracking system used to monitor Corrective Action Plan schedules and milestones.

15.3 Lessons-Learned Program

Describe the program responsible for collecting relevant site-wide and community-wide lessons learned, evaluating them and identifying potential applications, and implementing the lessons learned in site processes and activities.

Appendixes

List of Figures

List of Tables

List of Acronyms

List of Definitions

Agreements

Maps

Listing of Emergency Management Personnel

References

2. TRAINING AND DRILLS

2.1 Introduction

The purpose of this chapter is to assist DOE and NNSA field elements in complying with the DOE O 151.1C requirement to ensure that a coordinated program of training and drills for developing and/or maintaining specific emergency response capabilities is an integral part of the emergency management program. The program must apply to emergency response personnel and organizations that the facility/site expects to respond to onsite emergencies. The Order further requires that emergency-related information must be available to offsite response organizations.

This chapter is designed primarily for facilities/sites and activities that are required to implement an Operational Emergency Hazardous Material Program and is directed at operations and emergency management staff at Field Elements and operating contractor organizations that are responsible for DOE and NNSA facilities/sites and activities.

2.2 General Approach

DOE/NNSA emergency management training programs must ensure that personnel are prepared to respond to, manage, mitigate, and recover from emergencies involving hazards associated with facilities and onsite activities.

A comprehensive and systematic training program should be established to accomplish emergency management training goals. The training program should provide a current and structured view of program-specific training requirements and also address position-specific requirements for all primary and alternate personnel assigned to the emergency response organization. Minimum program standards should be defined for emergency responder position training, proficiency, performance, and refresher training. The program should be integrated and coordinated with related training programs provided by other site organizations. Training courses should be performance-based and include testing to validate learning. The program should ensure that instructors are qualified in both instructional skills and technical competency for the training subject.

Training documentation and records should be formally managed and controlled to ensure that training programs support current emergency plans and requirements and that training records are maintained for instructors and for all personnel assigned Emergency Response Organization (ERO) positions. Drill and exercise participation and performance should be documented for each member of the ERO.

Requirements for initial and periodic refresher training should be identified for all emergency response organization personnel. This should include special team training for functional groups with technical and management assignments and training for decision makers to ensure they can perform duties promptly and accurately. Training needs should also be addressed for offsite emergency response personnel and organizations that are expected to support onsite response to emergencies. This includes

training on facility and site-specific hazards and emergency plans and participation in training and drills to ensure integration of onsite and offsite response resources.

Emergency drills should be developed, scheduled, and conducted to provide supervised “hands-on” training and validation of classroom training for emergency responders and to provide practical training on interface between site groups that support emergency response. Drills should be developed based upon feedback from actual events and exercise experience, to validate corrective actions from program evaluations, and to validate new or revised procedures and equipment or facility changes.

The Department of Homeland Security (DHS) employs a broad definition of “exercise” that focuses on many of the general functions attributed to the training and drills programs [cf. DHS Homeland Security Exercise and Evaluation Program (HSEEP)], as described in this emergency management guidance. For example, the “drill” is considered an “exercise” that can be used for *training* or *testing performance* in a single or limited functional area. The broad range of purposes attributed to exercise activities described in the HSEEP series emphasizes the design of exercises to familiarize personnel with plans and procedures, achieve teambuilding, build consensus, examine contingencies, solve problems, evaluate functions, measure resources, and examine interfaces. Although these training aspects of drills are emphasized in DOE guidance, the term is commonly used throughout the DOE/NNSA complex as a small-scale exercise (e.g., facility-level exercise).

This chapter of the EMG provides a system-based approach to emergency management training and is organized into the following sections:

- Training program management
- Training needs assessment for onsite and offsite personnel
- Training requirements
- Training development
- Training delivery
- Training drills/practical applications

Sites should reference DOE G 414.1-2A for information on training plans, training effectiveness, qualification of personnel, and management responsibility regarding training programs and also reference DOE O 360.1B, *Federal Employee Training*.

2.3 Training Program Management

Effective management of a training program requires a formal training plan be developed that describes program goals and objectives, organizational responsibilities, resources, and planned activities. To accomplish the elements of the program plan, a schedule of development, delivery, and evaluation activities should be developed and updated as needed. Annual internal assessments of training development and implementation identify needed improvements in the program. Trainer/instructor qualifications should be

established and updated to reflect changes in instructional techniques as well as relevant technical disciplines. Evaluation of the training staff ensures their appropriate skill levels and the knowledge base. Documentation of training requirements and lesson plan reviews ensure that the course materials meet expectations for the subject positions. Finally, a system for managing emergency responder training records ensures that staff personnel on ERO rosters are trained for the positions assigned.

2.3.1 Program Plan

A comprehensive and systematic training program plan includes the following:

- A full description of training program goals and objectives, compliance with requirements, and administrative policies and procedures
- Identification of current training needs for all emergency responder positions
- Identification of training resources, staff, facilities, and reference material to support training activities
- Schedule for training activities, including development, delivery and evaluation of training programs and courses
- Description of the process for identifying and documenting training needs for emergency responders
- Requirements for ERO qualification and re-qualification, including retraining and remedial training

The program plan should also identify administrative processes that support the systematic approach to training. Such processes should be identified for the following elements of training management:

- Identifying training program approval and signature authority
- Establishing a matrix of training requirements for ERO positions
- Identifying methods for selecting qualified instructors and establishing a list of training staff qualified to teach each course or program
- Describing how training records are maintained in a manner that can be audited
- Describing how refresher training addresses the details of program changes and lessons learned from actual events, exercises, and program evaluations
- Describing how the emergency management training program is integrated and coordinated effectively with related training provided by other organizations

(e.g., confined space entry training, radiological monitoring training, and hazard communication training)

The training program plan should address training for all primary and alternate personnel assigned to the facility- and site-level ERO. A training program plan typically distinguishes the following levels of training requirements:

- Initial training to qualify for a position on the ERO
- Refresher training to maintain competency and receive information on changes and lessons learned related to required knowledge and skills
- Remedial training to correct deficiencies in performance or testing related to ERO positions
- Annual participation in performance-based training methods such as drills, simulations and exercises in order to maintain ongoing proficiency and skills

An effective way to illustrate the emergency management organization's training plan is to use a matrix to list ERO positions and specific training required for each position. The matrix is both an internal tool for tracking positions and training as well as a tool for satisfying external evaluators of the completeness of the program.

2.3.2 Schedule

A schedule for developing, delivering, and evaluating training activities should be developed and updated as needed. The schedule should provide a current and structured view of program-specific training requirements, including a detailed list of courses and drills provided by the emergency management department, as well as dates for scheduled implementation. Internal program assessments should be also indicated.

2.3.3 Program Assessments

Internal assessments of training development and implementation should be performed once a year as part of the required annual assessment of the overall emergency management program. A process should be identified to ensure that recommendations from training assessments and lessons learned from previous *training* drills are incorporated into future training development and implementation efforts. Internal assessments should aim to improve training programs, including administration, development and delivery. The site internal corrective actions tracking system provides a convenient tool for ensuring that identified corrections are made to the program.

2.3.4 Trainer/Instructor Qualifications and Evaluations

Qualifications. Each training program should develop a list of requirements for qualifying instructors/trainers. These requirements should be reviewed and updated periodically to keep pace with changes in instructional techniques as well as relevant

technical disciplines. Two primary qualification areas to be addressed in instructor requirements are as follows:

- ***Instructional skills*** - These are skills related to the imparting of knowledge, regardless of the subject. Examples include adult learning methodologies, presentation skills, and training in the use of various instructional media, such as video and on-line computer instruction.
- ***Technical knowledge and experience*** - Adequate understanding of theory, practical knowledge, and experience in the content area are needed. Technical competency is based on instructor credentials, job references, and demonstration of technical expertise. Proficiency in instructing the subject areas should also be evaluated as part of instructor qualification. Examples of areas where technical or subject-specific expertise are necessary include dose assessment, emergency medical and emergency public information.

A schedule should be established to ensure continuing education and professional development of emergency management trainers/instructors in their areas of expertise.

Evaluations. Management should also conduct internal reviews of the training staff as part of the annual assessment of the training program. These evaluations should demonstrate the following:

- The instructor methods are consistent with the site training program standards and are appropriate to the course objectives.
- Instruction adheres to the documented lesson plan and evaluation.
- Subject-matter knowledge and experience are appropriate for course content.
- Instructional presentation styles are appropriate and support course methodology.
- Instructor-related feedback/ratings from course evaluation forms are analyzed and documented.
- Post-training evaluations of instructors are analyzed and documented.

Instructor deficiencies identified during the evaluation should be corrected and documented within a specified period. Input from the evaluation should also be used to improve knowledge, skills, and abilities of the staff.

Documentation supporting the staff qualifications should be maintained in a manner that may be audited. Documentation should include the following:

- A matrix of staff positions, including requisite education and experience cross-referenced with each training staff member;

- Qualification records; and
- Feedback and post-training evaluations

2.3.5 Course Documentation

All documentation for a particular training program should be kept in either hard copy or electronic format. Files should be organized by date, iteration, or topic. Course history files should include rosters/attendance sheets, evaluations of knowledge and performance, and lesson plans and tests.

- ***Training Requirements*** - Training requirements for each emergency response position should be documented and reviewed and updated on an annual basis. This ensures training requirements are still relevant to that position and provides an opportunity to add any new requirements assigned to the position. For example, should hazards change or regulatory requirements for select training change, the organization may need to revise training requirements for some emergency response positions.
- ***Lesson Plan Reviews*** - Each site is responsible for maintaining current, documented lesson plans for all site-specific training developed by that site. Lesson plans include course documentation of classroom training, on-the-job training (OJT) programs, practical drill training and computer-based training. Lesson plans should be reviewed prior to their use. This process includes a review by a subject matter expert (SME) to ensure that information contained in lesson plans continues to be consistent with current procedures and practices and remains applicable to DOE emergency management. Lesson plans should be updated prior to use if there have been changes to the emergency plan and related procedures since the last annual review. Updates should include the dated signature of the SME.

2.3.6 Emergency Responder Training Records

A system for managing emergency responder training records should include a means for tracking the following:

- Course attendance and completion
- Status of individual emergency responder qualifications
- Scheduled training, including a system for reminding employees and program administrators when training is needed
- In-house and external training
- Training dates, location, length, and name of the instructor
- Participation in emergency drills and exercises

Training records should also include all documentation supporting the implementation of training developed by a DOE/NNSA facility/site or activity. Such documents include the following:

- Memos relating to scheduled and canceled training or training exemptions
- Certificates for training conducted outside of DOE
- Course and program evaluations

There have been situations in which training received by an individual emergency responder has become an issue during litigation after an accident or emergency. Facilities should seek advice from General Counsel to determine whether to include additional information in the training records. Examples of additional records to maintain may include lesson plans by course iteration, participant evaluations, and any memoranda or documentation regarding remedial training received by an individual.

2.4 Training Needs Assessment

2.4.1 Training for Onsite Emergency Responders

Training needs are based on tasks to be performed by an emergency responder, hazards that may be encountered by response personnel, and established requirements and standards for emergency responder training. A systematic process should be used to identify and document performance-based training requirements for emergency responder positions. Training needs are identified initially by reviewing regulatory requirements and existing training programs, and then conducting a needs analysis.

In the case of training requirements originating from a regulatory source [i.e., the Occupational Safety and Health Administration (OSHA), National Fire Protection Association (NFPA), DOE Order], a needs analysis may have already been accomplished and included in the regulation. Further in-depth analysis need not be conducted, once applicable requirements have been determined. These requirements should be included and addressed in the design and development phases of the training program. Examples of Federal requirements that specify training for emergency responders are included in Section 2.5.

A needs analysis should ensure that training for individual emergency response positions provides knowledge and skills associated with assigned tasks to be performed. The needs analysis should document the training that the emergency responder receives related to their normal position in the work force that is applicable to their ERO responsibilities. Training topics should reflect specific function, position, and responsibilities consistent with activities associated with the Program Elements of the emergency management program. Training should incorporate lessons learned in emergency planning and response based on site experience, as well as experience from throughout the DOE/NNSA complex, other government agencies, and private industry. Appropriate

topics to be considered for inclusion in emergency management training programs are listed in Section 2.5.

Analysis of emergency response training needs should be ongoing. Additional analysis is appropriate when a discrepancy or problem is identified in the performance of an emergency response task and whenever program changes occur. Responsible managers should receive and use information from a variety of sources to ensure that training continues to reflect changes and to address lessons learned. Training requirements may be modified based on changes in hazards, response facilities or equipment, communication systems, site or facility mission or layout, reorganization of the ERO, or revision of procedures or requirements. Training needs may also change based on drill or exercise evaluations, results of independent evaluations, occurrence reports, and industry lessons learned.

Tabletop analysis is a recommended method for identifying site-specific training needs. This method utilizes a facilitator to guide a group of subject matter experts through a process of job analysis and selection of tasks to be addressed in training.

For personnel who have transferred from another DOE site or for contractor or personnel with experience in a closely related industry, a streamlined and standardized qualification process can be established. The feasibility of streamlining qualifications must be evaluated on a case-by-case basis and documented by proof of experience. Some additional training will usually be required to become familiar with facility-specific hazards and procedures.

2.4.2 Training for Offsite Emergency Responders

Training needs should also be identified for offsite emergency responders who may be involved in response to site emergencies. The applicable agreements [i.e., Memorandum of Agreement (MOA) or Memorandum of Understanding (MOU)] should identify the type of training needed.

A systematic process should be used to determine which offsite organizations have emergency responders that may require site-specific training. For example:

- Facility-specific orientation training on hazards and emergency response procedures, as well as emergency notification and communications should be offered annually to state, tribal and local emergency response organizations.
- Private hospitals, medical and ambulance services expected to support onsite response efforts or receive contaminated injured personnel from the site should also receive training on site hazards and protection from those hazards as well as interface and communications with site responders.
- Offers of annual training for all parties in mutual aid agreements should be considered. These same parties should be offered the opportunity to participate in training drills and exercises. (Ref. DHS HSEEP program for specific information on

requirements pertaining to emergency exercises for local and state agencies and integration with offsite responders)

Training, drills and exercises should aim to achieve team building, consensus building, contingencies examination, problem solving, resources measurement, and interface examination.

2.5 Specific Training Requirements

Each site must determine the specific emergency response training requirements that apply to the ERO positions based on specific site hazards, conditions, resources, and emergency plans. Applicable requirements will differ from site to site. For example, for sites that involve mining operations, the Mine Safety and Health Administration (MSHA) regulations for mine rescue training may apply. Differences would result from the situation where a site must maintain an onsite fire brigade vs. a site that depends solely upon offsite agency fire response. The following sections describe specific training requirements derived from applicable regulations, position-specific functions, site characteristics and operations, and details of the emergency management program.

2.5.1 Regulatory Requirements

Training personnel should monitor applicable regulations promulgated by OSHA, MSHA, Nuclear Regulator Commission (NRC), Environmental Protection Agency (EPA), NFPA, and DHS. The impact of regulatory changes on training needs can be evaluated using the following questions:

- What conditions do the changes address?
- Do those conditions exist at this facility/site?
- Will changes influence the way our personnel perform their tasks?
- What specific effects will this change have on training?
- Does the condition require an immediate response?

The following are examples of non-DOE Federal and national requirements that specify training for emergency responders:

- 29 CFR 1910.156 specifies fire fighter training
- 40 CFR 265.37 specifies training for EROs Granted Facility Access and Training for Hospitals Receiving Facility Patients
- 40 CFR 112.7 specifies training for Spill Prevention, Control and Countermeasures
- 29 CFR 1910.120 specifies training for Hazardous Materials Emergency Response
- 29 CFR 1910.38 specifies training for Emergency Action Plan/Evacuation of Employees

- 29 CFR 1910.157 specifies Fire Extinguisher Education
- 29 CFR 1910.146 specifies Confined Space Rescue Training
- NFPA 472 specifies training for Professional Competence of Responders
- NFPA 473 specifies training for Professional Competence of EMS Personnel
- NFPA 1500 specifies training for fire department Occupational Safety and Health Programs
- NRP and NIMS
- DHS HSEEP, Volumes I through IV.
- Emergency Operations Training Academy (EOTA)

Other Federal or State training requirements may apply for some DOE/NNSA sites.

2.5.2 Site-Specific Training

General training for employee response, including training on protective actions in an emergency is required as part of the Operational Emergency Base Program. This may be included as part of an employer's General Employee Training (GET) Program. Emergency-related information in this training should include emergency awareness, overview of the organization's emergency response plan, warning systems and alarms, protective action (e.g., evacuation and sheltering), accountability for site workers in the event of an emergency, and first aid. Employees assigned to specific responsibilities for onsite emergency response should receive additional training to address those responsibilities. At a minimum, this includes emergency managers, building wardens who support personnel accountability and protective action procedures (e.g., personnel assigned to close doors and windows and shutdown of ventilation systems), personnel assigned to perform first aid/cardio pulmonary resuscitation (CPR) or use fire extinguishers, emergency spokespersons, and personnel responsible for interface with offsite response organizations that may support onsite emergency response.

2.5.3 First Responder Training

Initial and annual refresher training should be provided to workers who are likely to witness emergency conditions involving hazardous materials and who are expected to notify the proper authorities. These workers are expected to attain the applicable training level according to the requirements specified in 29 CFR 1910.120.

2.5.4 Offsite Responder Training

As discussed in Section 2.4, emergency-related information, instruction concerning notification procedures, and training on site-specific conditions and hazards should be made available to offsite personnel who might be requested to respond to an emergency at the DOE facility/site, as well as hospitals that have agreed to receive patients from facility emergencies. Offsite responders should also have the opportunity to participate in drills conducted to validate procedures and test integration of resources with the facility response organizations.

2.5.5 Training on Change

When changes occur involving facilities or sites (e.g., change in mission, facility decommissioning, organization reengineering) or when hazards change, employees and responders should receive training on how these changes apply to them and their responsibilities for emergency response. Annual re-training should address changes; however, training on changes may need to occur prior to scheduled re-training to ensure safe and effective response.

2.5.6 Operational Emergency Hazardous Material Program

The Operational Emergency Hazardous Material Program described in DOE O 151.1C requires a coordinated training program consisting of formal training and drills. The program develops and/or maintains specific emergency response capabilities for all personnel and organizations expected to respond to onsite emergencies. This training program should consist of a combination of self-study, homework, formal classroom training, field training focusing on skills, and drills. All personnel (including both the primary and alternates) who constitute the ERO should receive both initial and annual refresher training. Emergency-related training should also be made available to offsite response organizations.

Training should emphasize the need for prompt, accurate, and practical judgments involving event categorization and classification, protective actions and the urgency of notifications of Operational Emergencies. Training should address decision-making when information is incomplete or uncertain and when events and conditions are not covered explicitly by Emergency Action Level (EAL) procedures.

The training program should be “commensurate with the hazards” identified in the Emergency Planning Hazards Assessments (EPHAs). Individual training programs should be commensurate with assigned emergency-response responsibilities. Training topics should reflect the trainee’s functional position and responsibilities. Appropriate topics to consider in the training program include:

- Hazards assessments
- Emergency Management Program Administration

- Management and decision-making
- ERO
 - Incident command
 - Activation and coordination of response resources
 - Hazardous materials emergency response
 - Fire-fighting
- Offsite interfaces
 - Coordination and liaison with offsite response and support organizations
- Emergency facilities and equipment operation
- Emergency categorization and classification
 - Decision-making
- Notification and communications
- Consequence assessment
 - Dose projection
 - Field monitoring
 - Decision-making
- Protective Actions and Reentry
 - Protective actions/protective action recommendations decision-making
 - Reentry planning
 - Rescue
 - Decontamination
- Emergency medical support
- Emergency public information
 - Emergency spokesperson skills
- Emergency Termination and recovery
 - Recovery planning

2.6 Training Development

In this section, development of individual training courses is discussed. The initial step in training course development is establishment of goals and objectives. The method for delivery of the training will depend on the target audience and the goals and objectives of the training. Course materials will be designed to facilitate the learning process and will be consistent with the delivery method selected. A key element of the course development is identification of the method for testing whether students have successfully achieved the specified level of competency in the material presented. Once all aspects of the course have been developed, the training should be evaluated to determine whether it meets expectations. Finally, the special subject of remedial training development is briefly discussed in this section.

2.6.1 Training Goals and Objectives

The training or *instructional goals* for a specific course state the anticipated outcome of instruction. The instructional goal provides a broad statement of what will be accomplished at the conclusion of the lesson or course. Training *objectives* are measurable statements of intent that specify expected outcomes of each stage of training. They should state clearly what participants would know or be able to demonstrate after training. Course results will be measured against the original goals and objectives set at the beginning of course development.

2.6.2 Training Delivery

Methods of training delivery are an important consideration in the design of each course. Appropriate methods for delivering the specific training depend on the target audience's composition, location, need, and job complexity. The type of delivery for emergency management training should also be based on learning objectives, learning tasks, and group size. Class size may need to be controlled to maximize instructor/ student interaction. Classroom-style delivery of training may effectively use live classroom, video presentations, computer-based instruction, or self-paced instruction via computer disk and Internet. Most training should combine instructor presentation with student participation and hands-on demonstration and experience. Training demonstrations, role-playing, and practical skills training should be realistic but with due consideration for student and facility safety. ISMS practices should be fully implemented when bringing realism into practical training or drills.

To maximize student involvement, classroom training may be augmented with tabletop simulations, hands-on drills, role-playing exercises, group tasks, facilitated group discussions, and assigned reading/reporting. Practical exercises that put knowledge into practice are very effective to help ensure student ability to apply knowledge in the context of realistic hypothetical situations.

2.6.3 Developing Course Materials

Course materials are the materials used by instructor and participants to facilitate training. When preparing to develop course materials, first review any existing training materials, regulations, manuals, and industry guidelines for usability. Existing materials should be reviewed against instructional objectives to determine whether they partially or fully meet training requirements. Course materials can include lesson plans/course documentation, training support materials, and participant materials.

Lesson Plans/Course Documentation. An instructor uses a lesson plan as the primary training tool for guiding the learning process. Standard lesson plans for classroom instruction promote consistent, effective instructor presentation and may include the following:

- Administrative information (name of course, time allotted, target population, instructional method, and approval)
- Training goal and objectives
- Details about training methodology
- Lesson content based on learning objectives
- Lesson content sufficiently detailed to ensure consistent and repeatable training
- Safety information, as relevant
- Training support requirements

Training Support Requirements. Training support materials should be selected and/or developed to support and reinforce the learning objectives. For each course documented, identify, develop, and maintain a list of the resources including trainers, technology, equipment, and facilities (classrooms, laboratories, and response facilities) required to support training activities. Training support materials or aids to consider include computers, software, video, models, demonstration equipment, scenarios and classroom exercises.

Participant Materials. The purpose of participant materials is to enhance learning and to provide reference materials for participants. Materials might include any of the following:

- Student workbook
- Job aids such as procedures or equipment operating instructions
- Glossary of terms
- Checklists used to document action steps

- Copies of viewgraphs used by trainer to illustrate key points
- References discussed during training session
- Lesson plan outline

Participant materials should be marked “**For Training Use Only**” to ensure that trainees do not confuse them with procedures.

2.6.4 Test Methodology

Training and drills should include some form of measurement or demonstration that indicates completion of training objectives and achievement of qualification standards. Tests document the knowledge and skills a participant has gained from training. Written examinations and performance evaluations measure achievement of each instructional objective. Each evaluation item should reference a specific training objective.

Emergency drills in particular provide an excellent opportunity to incorporate performance tests of individual emergency responder and response group proficiencies. Instructors who evaluate practical performance tests during drills must have the technical experience and expertise to provide a valid assessment of performance.

When constructing a test, the following characteristics and constraints should be considered:

- Test length should reasonably reflect the length and complexity of the lesson plan that is delivered.
- Multiple test items for each learning objective may more accurately verify that learning has taken place.
- Vary test materials or use randomly selected test banks to ensure long-term validity of tests and ensure that test information is not shared and compromised between students.
- Performance tests should include checklists addressing each learning objective.
- Development of pre-tests and post-tests, and the comparison of results, can help validate that learning has taken place and help verify the effectiveness of the specific training course.
- Intermediate evaluation (i.e., measuring progress during the course) can help instructors to verify learning before the training course is complete and may prevent the need for remedial training at the end.
- Evaluation of course objectives measures what the participants know or can perform at the end of training.

2.6.5 Course Evaluation

Training programs should be evaluated by the training organization for the adequacy of the following: program and lesson content; examinations; presentation; documentation; and, post-training performance. Participants should be encouraged to provide evaluation of course materials and delivery as part of the overall program evaluation process. This evaluation process determines strengths and weaknesses, improves content and delivery, and ensures that revisions are made as appropriate. Development of new courses should include evaluation and validation of the effectiveness of course materials using pilot presentations, peer reviews, and/or review by subject matter experts.

2.6.6 Remedial Training

Remedial training is additional training provided to a participant who did not correctly answer the required number of test questions or who was unable to successfully complete a formal training session in the previous iteration. Because remedial training requirements are lesson-specific, they should be prescribed in each lesson plan so they are ready for use in case they are needed. Remedial training focuses on the specific knowledge or skills challenging the participant. Remedial training might consist of additional instruction or training directly related to the training objectives for the portion of the course in which the participant had difficulty. The remedial training is intended to raise the individual's competency to a level that allows attainment of the knowledge and skills required to successfully complete the lesson or demonstrate the skill proficiency required to perform the job.

2.7 Training Delivery

The previous section briefly discussed methods for delivery of training and how the delivery method should be part of the training plan. This section provides specific guidance to training organizations, including instructors responsible for actually delivering training. In preparation for delivery of training, training personnel should confirm that the following are ready for the training session:

- *Equipment* — instructional equipment such as projectors, VCRs, computer hardware, computer software and television monitors
- *Facilities* — classrooms and setup of the classroom, exercise sites, ranges, computer labs, etc.
- *Course administration* — materials, supplies, documentation, such as attendance sheets, certificates, and participant notebooks
- *Instructor Qualifications/Skills* — knowledge of lesson plan content and knowledge of target population's needs; preparation of lesson plan and participant learning activities

The following is practical guidance for instructors to help ensure successful delivery of training:

- Adhere to the lesson plan content and presentation method defined in the training design document.
- Adhere to all safety measures listed in the lesson plan.
- Create an instructional atmosphere that enhances the learning process.
- Use effective communication skills to keep students engaged in discussions and activities.
- Dress appropriately for the environment and training activities. For example, if the normal dress is business casual or if training will be conducted outside, dress accordingly.
- Provide and monitor feedback from participants to ensure active learning.
- Ensure that participants accomplish all the objectives during training.
- Ensure involvement of all students in training activities, group tasks, discussions, and hands-on learning experiences.
- Evaluate participant performance during and at completion of the training session.
- Ensure that all required materials are made available to the participant for self-paced training.
- Use standardized materials for on-the-job and technology-based training programs.

2.8 Drills

Drills are training methods that allow an individual to put knowledge into practice in the context of a scenario-based simulation. The drill provides practical training to enhance preparedness for emergency response personnel and organizations that are expected to respond to onsite emergencies. Qualification requirements for each emergency response position should include annual participation in at least one training drill (or, alternatively, an exercise) during which practical knowledge and skills are demonstrated.

Drills are supervised hands-on instruction and application sessions for individuals or teams. These sessions provide an opportunity to demonstrate and maintain individual and organizational proficiency. During drills, the desired skills or actions may or may not be first demonstrated by the instructor(s). These training activities are documented by a plan, which includes a performance checklist used by the instructor or evaluator. The checklist has two purposes: to provide feedback during the training and to summarize overall performance. Because the focus is training, it is often appropriate for

the instructor to stop and correct participant actions during the activity rather than waiting until the end.

Drills should be of sufficient scope, duration, and frequency to ensure adequate training for all emergency response functions applicable to the facility. The size and complexity of any drill will depend on the objectives. Many drills will be functional, focusing on training responders involved in a specific response function. Drills can range from hands-on instruction involving one procedure to a multi-organizational, scenario-driven event. Drills should be as realistic as possible, using realistic scenarios based on hazards surveys and EPHAs as well as actual facility conditions. Conduct of drills requires a skilled and experienced instructor(s) who can present the scenario, control activities of responders, and provide feedback that enhances learning.

Within the DOE/NNSA emergency management system, the distinction between a drill and an exercise is reflected in their primary purpose, namely, a drill is oriented toward training and is not a graded evaluation of the response activity. Because the focus of a drill is training, some aspects of drill conduct can be made more flexible than in an exercise. Some emergency response roles may be combined and the instructor/controller may be free to stop and correct the responder actions during the drill. In a small drill, one instructor may plan, conduct and evaluate the performance.

Consideration should always be given to the need for safety and security plans when drills are conducted. Any drill that has the potential to affect or might be observed by an offsite population (e.g., activities of a field monitoring team, smoke from a fire drill, etc.) should be planned to avoid public concern or inconvenience.

The following represent typical functions/activities for the focus of drills:

- Emergency medical team response
- Hazardous Material (HAZMAT) response
- JIC activation
- Dose assessment drill
- Field monitoring drill
- Emergency notifications/communications with offsite agencies
- Protective Force interface with Fire Department

Successful implementation of drills involves systematic planning, conduct, and assessment.

- Planning for drills should involve the following components:
 - ***Performance objectives.*** Identify the performance, including conditions and standards of performance. The objectives should reference a specific policy, procedure, or training requirement.

- **Performance checklist.** Develop a checklist based on the performance objectives, conditions, and standards of performance. Also, identify how the drill will be conducted in the context of the assessment checklist.
- **Scenario description.** Describe the elements or system being trained through use of the specific scenario. Scenarios may be restricted to specific, limited aspects of the emergency management system. Scenarios should be based on site hazards identified in the Hazards Survey or EPHA. The scenario description should include a detailed description of events and conditions that emergency responders need to deal with and a timeline of events and actions that are expected to take place.
- **Controls.** Describe the controls imposed to ensure the integrity of the drill (e.g., safety plans, security notifications, use of trusted agents, equipment controls, time limitations and coordination with other operational elements).
- **Resource requirements.** Description of resources needed to conduct the drill (e.g., facilities, personnel, and equipment).
- **Compensatory measures.** Describe the measures to be taken to compensate for any degradation of security or response capabilities during the training.
- **Documentation and approval process.** Identify the approval process for drill plans, the dates on which drills were conducted, and the results/corrective actions identified.
- **References.** Included are lesson plans, DOE Headquarters and site orders/manuals, and site policy documents containing requirements for objectives being tested.
- **Conduct** of a drill requires that the instructor adhere to the Emergency Plan. This ensures that the training provides an accurate and valid representation of the emergency management program. Feedback from the instructor during the training is essential.

Guidelines for conduct of a drill include:

- **Explain** the purpose and objectives of the training drill/practical application.
- **Maintain** a calm and professional attitude.
- **Question** to verify the knowledge gained by participants.
- When there is a deficiency, stop the drill/application and provide **immediate corrective action**.
- **Provide fact-based feedback.**
- **Respect** participants' experience and expertise.

- Assessment requires the instructor to document results of training drills in a formal report. Consider including the following elements:
 - **Description of the drill.** Describe the conditions under which the test was performed and specifics of who participated.
 - **Summary of performance.** Describe what was observed during the training drill. Include not only positives, but also opportunities for performance improvement.
 - **Results.** Analyze data to describe observed performance against the performance standards from the objectives.
 - **Remediation/corrective actions.** List and discuss recommendations for emergency response measures that did not meet requirements. Identify the individuals or organizations for corrective actions. If remedial training is required, identify the schedule for conducting the training. Both immediate and long-term solutions should be addressed.

Tabletop Activities. Tabletop activities represent a cost-effective type of training drill experience during which emergency responders have an opportunity to interact with other response positions and learn their individual responsibilities, decision-making functions, and communication requirements in the context of these interactions. Tabletops may range from lecture and guided discussion to a detailed verbal simulation of response to a particular scenario. The instructor and/or students *verbally* walk-down response to a facility-specific scenario to illustrate the overall direction the response is taking and to clarify participant perceptions of their roles.

Learning objectives for a tabletop will determine the focus of the activity (e.g., overall coordination versus detailed problem-solving). Because of the inherent flexibility of this approach, trainers are free to structure the training experience creatively, controlling scenario time and trainee activity. However, a tabletop requires significant preparation to ensure that objectives are satisfied. The instructor must be skilled to facilitate and record the training session. A co-instructor or recorder can also be used to note questions and problems to be addressed later through procedure revisions, additional training, or agreements between response groups. If a tabletop involves multiple response groups or a detailed or highly technical scenario, then representatives of the involved groups/agencies or technical specialists should be involved in the planning of the activity to ensure that scenario details, procedures, and expected response actions are correct.

Typical topics for the focus of tabletop training activities may include:

- Coordination and interfaces between the site and offsite agencies
- Emergency Operations Center (EOC) management decision-making
- Interfaces within the JIC

- Interfaces between site response groups (e.g., Health Physics, Security, Fire Department)
- Hostage negotiations
- Emergency categorization/classification

3. EXERCISES

3.1 Introduction

The purpose of this chapter is to assist DOE and NNSA field elements in complying with the DOE O 151.1C requirement to establish a formal exercise program that validates all elements of a facility/site or activity emergency management program over a 5-year period. The exercise program should validate both facility- and site-level emergency management program elements by initiating a response to simulated, realistic emergency events or conditions in a manner that, as nearly as possible, replicates an integrated emergency response to an actual event.

Planning and preparation for exercise conduct should use an effective, structured approach that includes documentation of specific objectives, scope, timelines, injects, controller instructions, and evaluation criteria. Each exercise should be based on a realistic scenario derived from the facility/site or activity Emergency Planning Hazards Assessment (EPHA) and must be conducted, controlled, evaluated, and critiqued effectively and reliably. Lessons learned from the exercise evaluation should be developed to ensure that corrective actions are implemented and improvements are made to the program.

Requirements, development, and implementation of an exercise program, including program planning and management, are addressed in this chapter. Guidance is provided on the design and development of an exercise including: scheduling, work planning, determining objectives, and production of an exercise plan. Exercise conduct, control, and evaluation processes are also described.

The Department of Homeland Security (DHS) Homeland Security Exercise and Evaluation Program (HSEEP) is a Federal-level exercise program developed by the DHS for State, county and local emergency management programs. The DHS approach addresses not only Homeland Security sponsored exercises, but also those exercises where Federal level agencies may interact with State, county and local emergency management programs. Therefore, to ensure consistency with the DHS approach to exercise development, conduct, and evaluation, common exercise concepts and processes of the HSEEP are incorporated in the guidance presented in this chapter using DHS terminology where applicable.

Two generic types of exercises will be defined in this chapter based on HSEEP exercise methodology: *discussion-based* exercises and *operations-based* exercises. Although both types can play a significant role in facility/site and activity preparedness activities, the guidance in this chapter will focus primarily on *operations-based* exercises, which are the subject of emergency management program requirements specified in DOE O 151.1C.

An easy-to-use computer-based tool for developing DOE emergency exercises, the **Exercise Builder**, has been developed by participants in the Emergency Management

Issues Special Interest Group (EMI SIG) Exercises and Drills Subcommittee, under the sponsorship of the DOE/HQ Office of Emergency Management. It makes available generic exercise components such as scenarios, objectives and criteria and provides a PC-based application that can be used to develop exercise packages. End products include exercise scopes, objectives, scenario materials, and evaluator modules. Once exercise packages have been developed, they can be modified for future use.

Training is also available for using Exercise Builder. Web-based tutorials are available to prepare emergency management staff to plan and develop exercise/drill objectives and scenario materials. Information for obtaining this training and the Exercise Builder tool can be found on the following website: <http://www.orise.orau.gov/emi>.

This chapter is designed primarily for facilities/sites and activities that are required to implement an Operational Emergency Hazardous Material Program and is directed at operations and emergency management staff at Field Elements and operating contractor organizations that are responsible for DOE and NNSA facilities/sites and activities.

3.2 General Approach

Emergency management exercises are formal, evaluated tests and demonstrations of the integrated capabilities of facility/site and activity emergency response resources (i.e., personnel, facilities, and equipment), conducted for the purpose of testing/validating multiple elements of an emergency management program. Exercises include realistic simulations of emergencies and tests of response capabilities, such as command, control, and communication functions and event-scene activities. Exercises can vary significantly in scope, size, and complexity to achieve their respective objectives.

A valid test of response capabilities requires a formal and structured approach for planning, developing, and conducting each exercise. Exercise-specific objectives are used to specify the emergency response functions to be tested. Exercise objectives must be well defined and achievable. The set of objectives should effectively define the pre-determined extent of organization/personnel participation and scope (i.e., breadth and depth) of exercise activities to be accomplished or simulated. The scenario must be based on the specific hazards associated with the facility/site or activity that is the focus of the emergency. The scenario must provide the opportunity for participating organizations/personnel to demonstrate each objective in order to evaluate the function or activity. The flow of the scenario timeline and events must be effectively controlled and the response of the participants must be realistic and professional. An effective evaluation and critique process, based on specific evaluation criteria, ensures clear and useful findings are accurately developed and ultimately will lead to lessons learned and corrective actions resulting in an improved emergency management program.

General guidance in this chapter is primarily applicable to *operations-based* exercises throughout the DOE/NNSA complex at all levels of the emergency response organization: facility, site, Cognizant Field Elements, and Headquarters levels for DOE/NNSA Federal and contractor organizations, including the response activities of the Radiological Emergency Response Assets and Transportation Emergency Preparedness

Program. This guidance follows the DOE/NNSA *commensurate with hazards* approach to emergency management. Guidance is provided for facilities/sites and activities with varying types and levels of hazards and with differing organizational structures and complexity.

Functional aspects of planning, development, and conduct of exercises are addressed, but not roles and responsibilities of specific organizations or individuals. Requirements, development, and implementation of an emergency management exercise program, including program planning and management, are presented. Guidance is provided on design and development of an exercise including scheduling, work planning, determining objectives, and production of an exercise package. Conduct, control, and the evaluation process for exercises are also described.

3.3 Exercise Program

A formal exercise program ensures testing and validation of the elements of a facility/site or activity emergency management program over a 5-year period. The program should provide a continuing series of periodically conducted exercises to evaluate emergency response capabilities and to provide assurances that members of the ERO are prepared to respond promptly, efficiently, and effectively to an actual emergency. The program includes a plan for validating all elements of each program by incorporating specific objectives in exercises over the planning period. The exercise program includes provisions for incorporating specific exercise objectives in each exercise designed to:

- Periodically test specific aspects of emergency response
- Validate plans/procedures
- Validate implemented corrective actions
- Test program improvements
- Evaluate notifications and communications

A formal exercise program should be established and maintained for each DOE/NNSA facility/site or activity to address the following:

- Long-range planning and scheduling for future exercises, and short-range planning for the current year's exercises
- Overall planning, preparation, conduct, control, and evaluation of exercises
- Development of comprehensive exercise objectives based upon Base Program and Hazardous Material Program requirements from DOE O 151.1C and program-specific EPHAs
- Development of exercises commensurate with, and based upon, the facility/site hazards and types of scenarios identified in the EPHAs

- Application of sufficient resources to the exercise program
- Roles and responsibilities of all aspects of the exercise development, conduct, and evaluation process are assigned

Long- and short-range program planning should include:

- A **long-range** plan to be prepared and maintained as part of the Emergency Readiness Assurance Plan (ERAP). The long-range plan should be developed in concert with the various organizations affected by its provisions. The plan should include the general schedule, scope, and objectives of the exercise over a 5-year period and provide for demonstrating all aspects of the emergency program in a systematic and comprehensive manner.
- A **short-range** plan to address fiscal year planning. It should include the scope, exercise objectives, participants, and schedule for the major tasks and activities associated with the current year's exercise(s). Planning and scheduling for a specific exercise includes confirming or modifying the planned scope, developing detailed objectives, committing the participants and resources, and identifying and scheduling the various activities.
- Each organization should identify a single individual who is responsible for the exercise program. Depending on the organization's size and the scope/complexity of the exercise program, these responsibilities may be the primary or collateral duties of the individual. Responsibilities include the authority or capability to commit and coordinate the resources necessary for an effective exercise program. Exercise program functions to be performed by the designated individual should include the following:
 - Resolving conflicts identified during the exercise scheduling process.
 - Concurring on the scope and objectives of each exercise.
 - Coordinating organizational resources for development, conduct, response, and critique of an exercise.
 - Monitoring potential programmatic impacts from the exercise development process, as well as resolving any specific exercise development difficulties or conflicts.
 - Coordinating with the training and drill program to ensure that all participants have completed their required *fundamental* emergency management training (not specific to an exercise) prior to a scheduled exercise.

3.4 Types of Exercises

Various types of exercises can be used to test and validate DOE/NNSA facility/site and activity emergency response capabilities. The type used will be based on DOE/NNSA

requirements and the identified goals of the exercise, and can include *discussion-based* and *operations-based* exercises.

3.4.1 Discussion-Based Exercises

Discussion-based exercises are used as a starting point in the building block approach to the cycle, mix, and range of exercises. Discussion-based exercises include seminars, workshops, tabletop exercises (TTXs), and games. These types of exercises highlight existing plans, policies, mutual aid agreements, and procedures. Discussion-based exercises typically focus on strategic, policy-oriented issues and are ideal tools for familiarizing agencies and personnel with current or expected jurisdictional capabilities. Facilitators and/or presenters usually lead the discussion, keeping participants on track while meeting the objectives of the exercise.

NOTE: Although referred to as “exercises” in DHS terminology, *discussion-based exercises* can accomplish evaluation functions similar to several frequently used techniques for conducting DOE emergency management *program evaluations*. These include emergency plan and procedure reviews, interviews, Limited Scope Performance Tests (LSPT) and tabletop drills (both of which are scenario-based discussions between evaluators and interviewees). Chapter 4, Section 4.5 of DOE G 151.1-3 describes some of these readiness assurance evaluation techniques.

A. Seminars

Seminars are used to orient participants to, or provide an overview of, authorities, strategies, plans, policies, procedures, protocols, response resources, and new concepts/ideas. Seminars can be a starting point when developing or making major changes to plans and procedures. Seminars offer the following attributes:

- Low-stress environment employing a number of instruction techniques such as lectures, multimedia presentations, panel discussions, case study discussions, expert testimony, and decision support tools
- Informal discussions led by a seminar leader
- Lack of time constraints caused by real-time portrayal of events
- Effective with both small and large groups

B. Workshops

Workshops, while similar to seminars, differ in two important aspects: player interaction is increased and the focus is on achieving or building a product (such as a plan or a policy). Workshops provide an ideal forum for:

- Collecting or sharing information
- Obtaining new or different perspectives
- Testing new ideas, processes, or procedures
- Training groups in coordinated activities

- Problem solving of complex issues
- Obtaining consensus
- Team building

Workshops, used in conjunction with operations-based exercise development, are useful in achieving specific aspects of exercise design (e.g., determining program or exercise objectives, developing exercise scenario and key events listings, and determining evaluation elements and standards of performance).

A workshop may be used to produce new emergency operating procedures, mutual aid agreements, Multiyear Exercise Plans, and Improvement Plans (IPs). Workshops share the following common attributes:

- Low-stress environment
- No-fault forum
- Employ different instructional techniques to convey information
- Facilitated, working breakout sessions
- Plenum discussions led by a workshop leader
- Goals oriented toward an identifiable product
- Lack of time constraint from real-time portrayal of events
- Effective with both small and large groups

C. Tabletop Exercise (TTX)

TTXs generally involve senior staff, elected or appointed officials, or other key personnel in an informal setting in which situations are discussed that arise during simulated scenarios. The TTX can be used to assess response plans, policies, and procedures, or types of systems needed to mitigate and respond to the specific emergency event. The TTX is typically aimed at facilitating understanding of concepts, identifying strengths and weaknesses, and/or achieving a change in attitude. The TTX format focuses on slow-paced problem solving rather than the rapid, spontaneous decision-making that occurs during actual emergencies or operations-based exercises.

TTX methods can be divided into two categories: basic and advanced. In a *basic* TTX, the scene set by the scenario remains constant. The emergency event is described to the participants up to a certain point in time. The leader is then presented with a set of problems to be discussed by participants, resolved by the group, and summarized by the leader. In an advanced TTX, play is initiated through injects to the participants that alter the original scenario. The exercise controller usually introduces problems one at a time in the form of written injects; participants then discuss the problems, using appropriate plans and procedures.

The TTX can have the following attributes:

- Practicing group problem solving
- Familiarizing senior officials with a situation
- Conducting a specific case study
- Examining personnel contingencies
- Testing group message interpretation
- Participating in information sharing
- Assessing coordination among participants
- Achieving limited or specific objectives

D. Games

A game is a simulation of operations that often involves two or more teams, usually in a competitive environment, using rules, data, and procedures designed to depict an actual or assumed real-life situation. It does not involve the use of actual resources, and the sequence of events affects, and is in turn affected by, the decisions made by the players. Games stress the importance of planner and player understanding and comprehension of interrelated processes.

Players are presented with scenarios and asked to perform a task associated with a scenario episode. As each episode moves to the next level of detail or complexity, it takes into account players' earlier decisions; thus, the decisions made by players determine the flow of the game. The goal is to explore decision-making processes and the consequences of those decisions. In a game, the same situation can be examined from various perspectives by changing the variables and parameters that guide player actions. Large-scale games can be multi-jurisdictional and include active participation from Federal, Tribal, State, and local governments.

Games are excellent vehicles for the following:

- Gaining policy or process consensus
- Conducting "what-if" analyses of existing plans
- Developing new plans

3.4.2 Operations-Based Exercises

Operations-based exercises represent the next iteration of the exercise cycle and can be used to validate the plans, policies, agreements, and procedures, possibly solidified in previous discussion-based exercises. Operations-based exercises include drills, functional exercises (FEs), and full-scale exercises (FSEs). They can clarify roles and responsibilities, identify gaps in resources needed to implement plans and procedures, and improve individual and team performance. Operations-based exercises are characterized by actual response, mobilization of apparatus and resources, and

commitment of personnel, usually over an extended period of time. Operations-based exercises play the primary role in the readiness assurance program for a facility/site and will be the focus of much of the guidance in this chapter.

A. Drills

According to the DHS exercise program HSEEP, a drill is a coordinated, supervised activity usually employed to test a single specific operation or function. Drills are also commonly used to provide training on new equipment, develop or test new policies or procedures, or practice and maintain current skills. Typical attributes include:

- A narrow focus, measured against established standards
- Realistic environment
- Performance in isolation
- Instant feedback
- Opportunity to stop, correct/educate, and restart

In Chapter 2 of DOE G 151.1-3, the drill program is focused on drills as part of the overall training program, whereas in this chapter the focus is on the role of drills as operations-based exercises, employed to test operations or functions.

B. Functional Exercise (FE)

The FE is designed to test and evaluate individual capabilities, multiple functions or activities within a function, or interdependent groups of functions. The FE is generally focused on exercising the plans, policies, procedures, and staffs of the direction and control nodes of Incident Command (IC) and Unified Command (UC). Generally, events are projected through an exercise scenario with event updates that drive activity at the management level. Movement of personnel and equipment is simulated.

The objective of the FE is to execute specific plans and procedures and apply established policies, plans, and procedures under crisis conditions, within or by particular functional teams. An FE simulates the reality of operations in a functional area by presenting complex and realistic problems that require rapid and effective responses by trained personnel in a highly stressful environment. Attributes of an FE include:

- Evaluating functions
- Evaluating Emergency Operations Centers (EOCs), Headquarters, and staff
- Reinforcing established policies and procedures
- Measuring resource adequacy
- Examining facility or site internal relationships

C. Full-Scale Exercise (FSE)

The FSE is the most complex of the operations-based exercises. FSEs are exercises that test many aspects of an integrated emergency response. An FSE focuses on implementing, analyzing, and evaluating plans, policies, and procedures. Events are projected through a scripted exercise scenario with built-in flexibility to allow updates to drive activity. A FSE is conducted in a real-time, stressful environment that closely mirrors a real event. First responders and resources are mobilized and deployed to the scene where they conduct their actions, as nearly as possible, as if a real incident had occurred.

The FSE simulates the reality of operations in multiple functional areas by presenting complex and realistic problems requiring critical thinking, rapid problem solving, and effective responses by trained personnel in a highly stressful environment. Other entities that are not involved in the exercise, but would be involved in an actual event, should be instructed not to respond. Typical FSE attributes include:

- Assessing organizational and individual performance
- Demonstrating interagency cooperation
- Allocating resources and personnel
- Assessing equipment capabilities
- Activating personnel and equipment
- Assessing inter-agency cooperation
- Exercising public information systems
- Testing communications systems and procedures
- Analyzing memorandums of understanding (MOUs), standard operating procedures (SOPs), plans, policies, and procedures

The level of support needed to conduct a FSE is greater than needed during other types of exercises. The exercise site is usually extensive with complex site logistics. Food and water must sometimes be supplied to participants and volunteers. Safety issues, including those surrounding the use of props and special effects, must be very closely monitored.

3.5 DOE/NNSA Exercise Requirements

DOE O 151.1C contains specific requirements associated with the conduct of operations-based exercises for DOE/NNSA facilities/sites or activities. The following specific exercise requirements apply:

- A. Facility Requirements.** Each DOE/NNSA facility [or group of facilities with common facility-level Emergency Response Organization (ERO) positions] must test and demonstrate the proficiency of personnel in facility-level ERO positions in accomplishing facility-specific emergency response duties and responsibilities in a **facility operations-based exercise**, including facility-level evaluation and critique, at least annually. Evaluations of annual facility exercises by Departmental entities (e.g., Cognizant Field Element, Program Secretarial Officer, or Headquarters Office of Health, Safety, and Security) must be performed periodically so that each facility has an external Departmental evaluation at least every 3 years. [These facility-level operations-based exercises can exhibit a number of the defining characteristics of **functional exercises (FEs)** in HSEEP terminology].
- B. Site Requirements.** A **site operations-based exercise** is designed to test and demonstrate integrated emergency response capabilities of personnel in facility- and site-level ERO positions. Site-level ERO elements and resources must participate in a minimum of one site operations-based exercise annually. For multi-facility sites, the basis for the exercise should be rotated among facilities or groups of facilities on a site. [In general, site-level operations-based exercises may be considered **full-scale exercises (FSEs)** in HSEEP terminology].

A **site operations-based exercise** that involves participation of offsite response organizations is referred to as a **full participation operations-based exercise**. According to DOE O 151.1C, offsite response organizations must be invited to participate in a site-level exercise at least once every 3 years. [In general, a **full participation operations-based exercise** may be considered a full-participation FSE.]

- C. Specific Activity Requirements.** Operations-based exercises of each of the Department's radiological emergency response assets must be conducted at least once every 3 years.
- D. No-Notice Exercises (NNXs).** Contractor facilities/sites and activities participate in a program of No-Notice Exercises, conducted in concert with and at the discretion of the Associate Administrator, Office of Emergency Operations, to determine if the facility/site or activity ERO accomplishes selected objectives, based on applicable plans, procedures, and/or other established requirements. Although generally operations-based exercises, NNXs can use the discussion-based exercise format if the specific objectives can be accomplished.

The NNX is designed to require minimum resource expenditure and cause only limited disruption of facility/site or activity operations. In addition to participation of initial responders, the site/facility organization assigns a "trusted agent" to assist in the identification of a credible emergency scenario and to provide facility- /site-specific information. The Headquarters (HQ) DOE/NNSA Office of Emergency Management schedules (with facility/site or activity concurrence), conducts, and documents the NNX and its evaluation, including the development and coordination of the exercise design package, providing an exercise director and controllers/evaluators, conducting participant and formal controller/evaluator critiques, and producing an After Action Report (AAR).

The primary purpose of the NNX is to provide an objective test of the ability of key elements of emergency response capabilities to respond without prior notice to a simulated Operational Emergency. NNXs are currently focused on initial activation, mobilization, and response activities in six program elements:

- **ERO** – Activation and mobilization of key elements of the ERO
- **Emergency Categorization and Classification** – Categorization/classification of the simulated emergency event
- **Notification and Communication** - Initial and follow-up notifications and communications
- **Consequence Assessment** – Initial assessments of the emergency [e.g., Timely Initial Assessments (TIA)]
- **Protective Actions** – Determination of initial protective actions and offsite protective action recommendations
- **Emergency Public Information** – Initial activities (e.g., initial press release)

The NNX provides a low-impact and low-cost opportunity to test the initial aspects of an emergency response and to enhance key initial function. The NNX is deliberately designed to minimize resources necessary for exercise planning, conduct, control, and evaluation. The NNX is characterized by a limited number of exercise objectives and either no effort or a minimal development effort expended on characterizing the consequences of the event for use by controllers during the exercise. An essential component of the NNX exercise is a limited disruption of normal operations that usually ensures the exercise will be of short duration (e.g., 2 to 3 hours).

The frequency for including NNXs in an annual readiness assurance program for a facility/site or activity should be based on the need for validating lessons learned; reevaluating areas based on observations during prior training, drills, or exercises; or validating recently implemented or revised plans and procedures without incurring the cost and impact of the facility- or site-level exercise.

3.6 Exercise Planning

This section addresses generic aspects of exercise planning. Planning for an exercise is fully documented by an exercise plan that includes: specific exercise objectives, scope, scenario, participants, simulations, timelines, injects (i.e., messages), technical data, safety and security provisions, controller instructions, and evaluation criteria. Planning should be coordinated among onsite ERO components and offsite organizations or groups regarding their respective participation and exercise objectives.

3.6.1 Exercise Planning Team

The exercise planning team is responsible for designing, developing, conducting, and evaluating all aspects of an exercise. The planning team determines exercise design objectives, tailors the scenario to the needs of the participating organizations, and develops documentation used in exercise evaluation, control, and simulation. Planning team members also help with developing and distributing pre-exercise materials and conducting exercise briefings and training sessions. Due to this high level of involvement, planning team members are ideal selections for controller and evaluator positions during the exercise itself.

An Exercise Director manages the exercise planning team (also referred to as the Lead Exercise Planner or Exercise Planning Team Leader). The team should be a manageable size and include a representative from each major participating onsite and offsite emergency response organization/agency, with team membership modified to fit the type or scope of an exercise, (e.g., an operations-based exercise may require more logistical coordination than a discussion-based exercise). Depending on the individual exercise, planning team members can be drawn from a variety of response disciplines within a DOE/NNSA facility/site (e.g., fire/hazardous materials, emergency medical services, security, emergency management, occupational health, and emergency public information). The planning team may expand or contract in size according to the scope of a given exercise, causing a member or group leader to assume additional roles.

Exercise planning teams should follow a combination of common considerations and principles, including:

- Exercise planning teams can be efficient and effective when they adhere to an **Incident Command System (ICS)**-based structure.
- Planning teams should be formed in advance of the exercise to ensure adequate time for effective planning, preparation, and review of the exercise package.
- Members assigned to these teams should be familiar with emergency plans and procedures in their areas of technical expertise and be experienced in exercise development.
- Team members may work independently or meet in subgroups to develop their respective parts of the scenario; members can participate in more than one team, if necessary.
- Effective project management ensures identification, development, and management of critical and supportive tasks; frequent communication about project status; and use of management plans and timelines (e.g., task schedules, Gant charts).
- Exercise planning team members should be aware of both their individual responsibilities and team responsibilities. Tasks should be identified and assigned to an appropriate planning team member, and clear deadlines should be established.

- Subject matter experts (SMEs) should be used in the planning process to ensure that a realistic and challenging scenario is chosen. For example, in a biological terrorism scenario, public health departments and hospitals will have larger roles than special weapons and tactics teams or the bomb squad.
- Certain exercise objectives may require detailed technical or specialty areas of expertise for the development of scenarios, injects, and data. In these situations, a special team can be formed. Typically, this expertise is in specific areas or disciplines such as process operations, health physics, medical, chemistry, safety engineering, or plume modeling.
- Team members should demonstrate appropriate leadership principles, including mentoring, motivation, discipline, personnel management, and time management. Team leaders and members should delegate tasks as necessary. Planning team members should strive toward group and common goals, using all available expertise while fostering creativity.
- Team members should implement standardized processes (such as incorporating task, time, and project management) into exercise design and development. Exercise planning meetings/conferences should be scheduled to develop and review tasks and outputs.
- Both DOE/NNSA and contractor senior management representatives should be briefed to gain their support.
- Coordination with the emergency management training program manager (if designated as a trusted agent) should occur in the exercise planning stage. This allows sufficient time before an exercise is conducted to satisfy any new management training or qualification requirements (not specific to an exercise).

Exercise planners are to consider themselves as *trusted agents* and understand that, in most cases, they will participate as facilitators or SMEs, rather than as participants. Planning team members, as a general rule, are not exercise players except at smaller, less populated DOE/NNSA facilities with limited emergency response/ management capabilities. In those cases, exercise planning team members who act as both planners and players should be especially careful not to divulge exercise information in advance.

3.6.2 Exercise Planning Functions

Development and conduct of a DOE/NNSA exercise requires a structured and coordinated planning process. For each exercise, the following list includes several key functions or activities that should be accomplished at some level, depending on the type and scale of the exercise:

- Development, documentation, and scheduling.
 - Scope - Who, what, where, how, and why of the exercise.

- Objectives - Specific objectives provide the basis for evaluating/validating the performance of response capabilities by each participating organization. Each exercise objective should clearly state what is to be demonstrated and be specific, attainable, and measurable.
 - Participants - Who will plan the exercise and who will respond, control, and evaluate. Any limitations or simulations regarding their participation are identified and documented.
 - Safety - Safety is an integral part of each exercise. The exercise should be conducted in a manner that protects workers and other personnel and does not cause harm to the environment.
 - Security - Instructions on facility access, use of firearms, and classification issues.
 - Scenario – Technically accurate mechanism developed to provide responders with the opportunity to meet objectives. The scenario is consistent with the set of exercise objectives and explicitly supports an evaluation/validation of each objective.
 - Budget - What the exercise will cost to plan, conduct, and evaluate, and the financial obligations of participating organizations.
 - Logistical Support - Specific responsibilities for support activities.
 - Administrative Activities - Procurement, documentation, and reproduction responsibilities.
 - Public Affairs Plan - A public information/education plan should be developed, especially for full-participation site-level operations-based exercise, to coordinate activities with appropriate offsite State, Tribal, and local authorities, the media, and the public. This plan should be developed early in the planning process to ensure coordination with interested offsite authorities/officials.
- Oversight of the exercise development process.
 - Exercise control
 - Exercise evaluation and critiques
 - Exercise AAR
 - Implementation of corrective actions

These key functions or activities should be reflected in the Exercise Planning Team structure presented next.

3.6.3 Exercise Planning Team Position Descriptions

Providing exercise planning team members with clearly stated roles and responsibilities, along with assigned specific tasks and completion timelines, will facilitate the exercise planning process by ensuring that tasks are not overlooked, forgotten, or identified only at the last minute. Regardless of the size of an exercise planning team certain core groups must be formed as described below:

Exercise Director/Lead Exercise Planner

- Overall responsibility for exercise planning, development, conduct, and evaluation

Planning Group

- Schedules exercise activities
- Determines exercise scope, objectives, participants, and planning schedule
- Develops scenario guidelines
- Coordinates administrative, logistics, safety, and security activities
- Maintains fiscal responsibility

Scenario Development Group

- Includes members from all participating organizations
- Coordinates development, assembly, and production of exercise package
- Develops scenario component, including, for example – scenario narrative, Master Scenario Events List (MSEL), time line, injects and messages, and the exercise technical data

Control Group

- Responsible for the safe and effective conduct of the exercise
- Exercise control
- Safety

Evaluation Group

- Responsible for observing, evaluating, and critiquing the exercise

Other planning groups (tasks may be separated from above main teams)

- Administration/Logistics
- Communications

- Technical data preparation
- Security/safety
- Public information
- Visitors

If an ICS management model is used for organizing the Exercise Planning Team, then the groups described above will be formed under the headings of core ICS groups: Command Group, Operations Group, Planning Group, Logistics Group, and Administration Group (Cf. HSEEP reference).

During the planning process, as tasks increase in frequency and complexity, the planning team grows. It may be necessary to expand positions to include several functional experts or SMEs and additional logistical support or service staff. Many large, complex exercises may start with a planning team that fills most, if not all, of the organizational structure represented by the groups indicated above.

3.6.4 Exercise Planning Meetings/Conferences

The Exercise Director/Lead Exercise Planner and the exercise planning team should decide on the number of meetings needed to successfully conduct a given exercise. To effectively host planning meetings, the Exercise Director needs access to information on the program, its objectives, and its flexibilities and limitations. Listed below are basic descriptions of primary objectives for each type of planning meeting along with information on tools (e.g., agendas, draft documents, checklists, and presentations) used to assist the exercise planning team in designing, developing, and conducting an exercise.

Providing advance information to the planning team members significantly enhances the efficiency of a planning meeting. These materials may be provided to team members in a read-ahead packet, which may include proposed agenda items, any relevant background information, and expected meeting outcomes. In addition to making the attendees better informed, a read-ahead packet also allows them to understand the relevancy and importance of the meeting.

The scope, type (operations- or discussion-based), and complexity of an exercise should determine the number of meetings necessary to successfully conduct an exercise. Planning meetings are listed in typical chronological order:

A. Concept and Objectives (C&O) Meeting. The C&O meeting is used to identify the type, scope, objectives, and purpose of the exercise. Typically attended by the Exercise Director, management of the sponsoring facility, and DOE and Management & Operating (M&O) contractor management responsible for other facilities and the response assets expected to be involved in the exercise, and representatives from participating offsite response organizations. The formal beginning of the planning process (when held directly before the Initial Planning Conference/Meeting [IPC]) helps planners identify an overall exercise goal, develop rough drafts of exercise objectives, and identify exercise planning team members. For less complex exercises

and for sites or facilities with limited resources, the C&O meeting can be conducted in conjunction with the IPC.

Possible topics or issues for a C&O meeting include:

- Exercise purpose
- Review of the facility/site or activity
- Review of the applicable EPHA
- Proposed scenario, goals, and objectives
- Exercise location, date, and duration
- Assumptions and artificialities (the scenario is plausible and events occur as they are presented; there are no hidden agendas or trick questions)
- Control and evaluation
- Security organization and structure
- Logistics

B. Initial Planning Conference/Meeting (IPC): The IPC lays the foundation for exercise development. It is used to gather input from the exercise planning team on the scope, design, requirements and conditions (such as assumptions and artificialities), objectives, level of participation, and scenario variables (e.g., hazard selection, venue). The IPC obtains the planning team's input on exercise location, schedule, duration, and other details required to develop exercise documentation. Planning team members should be assigned responsibility for the tasks outlined in the meeting. Unless a C&O meeting is held, the IPC is typically the first step in the planning process.

During the IPC, planning team members are assigned responsibility for tasks associated with designing and developing exercise documents and logistics (e.g., incident scene management, personnel). In addition to conducting the meeting, the team should gather appropriate photos and audio recordings for use in preparing the final documents and/or multimedia presentations used in support of the exercise. An important discussion point for an IPC includes understanding the rationale for developing the exercise.

Outcomes expected as a result of an IPC include:

- Clearly defined, obtainable, and measurable objectives
- Identified scenario variables (e.g., threat scenario, number of casualties, venue)

- Appropriate participants are invited to participate
- SMEs and presenters identified and recruited, if necessary
- Information delivery method identified
- Responsibility assigned for exercise documents and presentations/briefings
- All source documents (e.g., policies, plans, procedures) acquired to draft exercise documents and presentations
- Responsibility for logistical issues (e.g., registration, badges, invitations) identified and assigned
- Dates for completion of action items and tasks established
- Planning schedule developed
- Critical tasks for the next planning meeting identified
- Date, time, and location of the next meeting and the actual exercise

In the period between the IPC and the next meeting, exercise planning team members should prepare their assigned draft exercise documents and presentations. If possible, these materials should be provided to planning team members in advance of the next meeting.

C. Mid-Term Planning Conference/Meeting (MPC): Typically employed for operations-based exercises (e.g., drills, FEs, and FSEs), the MPC presents an additional opportunity in the planning timeline to settle logistical and organizational issues that arise during planning (e.g., staffing concepts, scenario and timeline development, scheduling, logistics, and administrative requirements). It is also a session to review draft documentation. A MSEL meeting can be held in conjunction with or separate from the MPC to review the scenario timeline for the exercise.

The second half of the MPC can be devoted to development of the scenario timeline. If necessary, the exercise planning team may allow sufficient time to conduct a walkthrough of the exercise site and gather pictures, maps, and other visual aids. The MPC should be held at, or near, the exercise site to facilitate the walkthrough.

The following outcomes are expected as a result of an MPC:

- Final exercise plan details (if applicable) agreed upon
- Scenario timeline revised
- Documentation revised

- Scenario injects developed
- Date, time, and location of the Final Planning Conference/Meeting (FPC) finalized

The time between the MPC and the FPC should be used to finalize the exercise plan, scenario timeline, and remaining exercise documentation (as determined at the IPC).

D. Master Scenario Events List (MSEL) Meeting: For more complex operations-based exercises, one or two additional planning meetings, or MSEL meetings, may be held specifically to review the scenario timeline. If not held separately, MSEL meetings can be incorporated into the MPC and FPC. The MSEL meeting should focus on MSEL development.

The MSEL is a chronological list that supplements the exercise scenario with event synopses, expected/anticipated responses, anticipated timing and location of the opportunity for meeting exercise objectives, and responsible personnel. The MSEL should include scenario events that will prompt players to implement the plans, policies, and procedures that planners want the exercise to test. The MSEL identifies the timing and summary content of all key events, messages, or injects and contingency messages. It should also establish the methods that will be used to inject each particular event (e.g., phone call, fax, radio call, e-mail).

In developing the MSEL, the exercise planning team must first consider tasks, conditions, and standards set forth by each exercise objective (as determined during the IPC). A task consists of performing a function or activity that demonstrates the ability to accomplish an objective. A condition is the environment in which a task is performed and can be established by the scenario or through the MSEL. Standards are the criteria by which each task is evaluated. The planning team determines if tasks were completed; this allows evaluation to take place.

If scenario conditions do not stimulate the appropriate behavior, the planning team must develop a MSEL entry to explain the situation. A well-written entry considers the following:

- If the entry is a key event (i.e., is it directly related to meeting an exercise objective)
- The target behavior, who will demonstrate the target behavior, and what will stimulate the behavior (e.g., course of play, phone call, actor, video)
- What/Who originates the stimulant, who receives it, and how is it received
- What the expected action is
- A contingency inject in case the behavior fails to be demonstrated

Once the MSEL is drafted, the exercise planning team should coordinate and sequence entries and resolve any conflicts between events, thus forming a credible and challenging MSEL that will enhance the exercise experience for the players. It is essential that the final MSEL be reviewed with quality assurance procedures in mind.

E. Final Planning Conference/Meeting (FPC): The FPC provides a forum to review the process and procedures for conducting the exercise, final drafts of all exercise materials, and all logistical requirements. There should be no major changes made to either the design or the scope of the exercise or to any supporting documentation. The FPC ensures that all logistical requirements have been arranged, all outstanding issues have been identified and resolved, and all exercise products are ready for printing. The FPC should be located in close proximity to the planned exercise site to allow a final site walkthrough. The facility should be conducive to discussion and accomplishment of work-related tasks.

The following items should be addressed during the FPC:

- Resolve any open issues related to exercise planning and identify last-minute concerns that may arise
- Review all exercise logistical tasks (e.g., schedule, registration, attire, special needs)
- Conduct a comprehensive final review of and approve all exercise documents and presentation materials

The FPC should not generate any significant changes or surprises. Outcomes should include finalization of exercise documents and multimedia presentation materials for production, identification and resolution of last-minute issues, and coordination of other support requirements (e.g., A/V equipment, room configuration and setup, refreshments, and schedule). Final approval of exercise processes and procedures should occur.

Contact should be maintained between all exercise planning team members regarding any outstanding issues, especially issues related to the logistics for conducting the exercise. The planning team should finalize all publications, prepare all supporting materials, rehearse presentations and briefings, and prepare to conduct the exercise. Prior to the exercise, information and documentation should be disseminated to appropriate personnel (e.g., presenters, facilitators, controllers, evaluators, simulators).

3.6.5 Exercise Planning Schedule

Planning and scheduling an exercise requires the involvement and cooperation of all participating organizations. A well planned, executed, and documented exercise requires the coordination and cooperation of senior management, facility- and site-level EROs, and, when applicable, offsite response organizations. Participating offsite response

organizations must be included in the initial planning stages of the exercise. Their participation may range from the limited staffing of a control cell for the purpose of receiving notifications to the complete staffing and activation of all applicable response facilities and assets. In planning the exercise, adequate time should be allowed for effective preparation and review of the exercise plan.

Table 3-1 contains a sample schedule applicable to a DOE/NNSA complex site-level exercise; planning times should be adjusted down for smaller scale exercises.

Table 3-1. Sample Planning Schedule for a Site-level Annual Exercise

<i>Calendar Days Prior To the Exercise</i>	<i>Planning Activity</i>
365	Establish or confirm exercise date. Establish exercise scope.
270	Establish planning organization. Confirm scope and level of participation by all organizations. Develop initial exercise objectives.
180	Verify plans and procedures to be used. Begin scenario development.
150	Finalize exercise objectives.
90	Submit scenario narrative, scope, MSEL (draft), objectives and participant list to Cognizant Field Element, Program Secretarial Office and Associate Administrator, Office of Emergency Operations (NA-40).
60	Complete planning group review/revision of draft Exercise Plan (EXPLAN). Submit EXPLAN to DOE/NNSA Cognizant Field Element for approval. Plan must be approved at least 30 days prior to exercise.
30	Submit approved EXPLAN to Program Secretarial Office and Associate Administrator, Office of Emergency Operations (NA-40).
15	Complete generic controller/evaluator training.
1-5	Conduct exercise-specific controller/evaluator training. Conduct responder and observer briefings.
1-2	Finalize exercise preparations.
Post Exercise	Conduct critiques.
Post Exercise 15	Complete draft AAR.
Post Exercise 45 [~30 working days]	Finalize AAR and submit a copy to Cognizant Field Element, Program Secretarial Office and Associate Administrator, Office of Emergency Operations (NA-40).
Post Exercise 85 [~60 working days]	Develop/prepare corrective and improvement actions and submit a copy to Cognizant Field Element, Program Secretarial Office and Associate Administrator, Office of Emergency Operations (NA-40).

3.7 Exercise Documentation

Typical exercise documents resulting from the efforts of the Exercise Planning Team are addressed in the following sections. They provide essential components for preparing, conducting, and evaluating exercises.

3.7.1 Situation Manual (SITMAN)

The SITMAN is a participant handbook for discussion-based exercises, particularly TTXs. It provides background information on the exercise scope, schedule, and objectives. Also included is the scenario narrative that will drive the participant discussions during the exercise. The SITMAN should mirror the multimedia briefing and supporting narrative allowing participants to read along while watching events unfold.

3.7.2 Exercise Plan (EXPLAN)

An EXPLAN or exercise package, typically used for operations-based exercises, is published and distributed prior to the start of an exercise. The EXPLAN provides a synopsis of the exercise and addresses the exercise objectives and scope. The EXPLAN assigns tasks and responsibilities for successful exercise execution and provides documented components essential for preparation, conduct, and evaluation of the exercise. The EXPLAN contains all the documentation necessary to control and evaluate the exercise, however, the extent and detail of the information will vary with the scope and complexity of the particular exercise.

The EXPLAN contains an explanation of the exercise and provides the documented components essential for preparation, conduct, and evaluation of the exercise.

Development of an EXPLAN by an exercise planning team involves an iterative process consisting of several steps:

- Address issues of exercise scope and duration, participants, objectives, administrative and logistical considerations, and operational or technical constraints
- Develop a scenario timeline, a listing of the sequence and timing of key operational, technical, and logistical events comprising the scenario
- Refine the timeline, develop detailed scenario information, prepare message injects (instructions to controllers) and data, and prepare control, evaluation, and other supporting documentation

This iterative development and refinement process is followed by a final review. Final review of the EXPLAN is conducted to ensure overall completeness and technical accuracy and that players/responders are provided the opportunity to meet the exercise objectives. The EXPLAN should be completed in sufficient time to allow DOE or NNSA line management and the DOE Associate Administrator of Emergency Operations to review and comment before the conduct of the exercise. However, some elements of the EXPLAN, such as, telephone directories or lists containing names of controller/evaluators will be subject to change up to the conduct of the exercise. Prior to final review and distribution, a Derivative Classifier (DC) should review the EXPLAN.

The scenario reflects current facility/site- or activity-specific hazards, correlates technically with the EPHA, and is technically accurate in terms of operations and

radiological, chemical, and meteorological data. A unique scenario should be developed for each exercise to prevent responder anticipation of events and to ensure a valid test of integrated response capabilities. The final approved EXPLAN or exercise package provides documentation to conduct and evaluate the exercise.

The EXPLAN or exercise package contains all documentation necessary to control and evaluate the exercise, however, the extent and detail of information will vary with the scope and complexity of the particular exercise. The format can be tailored by individual organizations but should include the information outlined below. The exercise web site at <http://www.orise.orau.gov/emi> contains specific examples of EXPLANs. A typical DOE/NNSA EXPLAN includes the following components:

- A. *Scope and Purpose.*** All participating organizations, the extent of their participation, and the organizations being simulated are identified. States the purpose of the exercise. Contains the type of exercise, the location of the event scene (e.g., specific facility), facility/site or activity background information, and the date and expected duration.
- B. *Exercise Objectives.*** The objectives are the key to the exercise. Each exercise objective should clearly state what is to be demonstrated and should be specific, attainable, and measurable. They should contain specific conditions, performance/action, and standard of performance to define how the objective is to be evaluated. Exercise objectives are discussed further in Section 3.8.

Use of an exercise objective matrix is recommended as a tool to facilitate administration of the exercise program. The matrix should identify all programmatic exercise objectives and correlate with facility/site- or activity-specific hazards and the specific objectives to be demonstrated in individual exercises. It should support/document validation of emergency management Program Elements over the five-year period. In order to test the interfaces between site security and facility/site emergency response capability, the exercise program at a DOE/NNSA facility/site should include security scenario events.

C. *Exercise Organization.* The exercise organization is comprised of all participants in the actual conduct of the exercise and includes the following:

- Exercise Director/Lead Exercise Planner ensures exercise conducted according to the EXPLAN
- Players include actual responders and onsite and offsite organizations
- Evaluators are subject matter experts who observe, monitor, and evaluate player performance; they are responsible for critiques and final AAR
- Controllers ensure that the exercise proceeds on schedule; monitor the sequence of events and input contingency injects to keep exercise on time; monitor safety;

input technical data at appropriate times in the scenario; and, assist with critiques and the final AAR

- Observers/visitors should have no interaction with players/responders

D. *Scenario Narrative.* The scenario narrative is a storybook summary of the background, initial conditions, initiating events, and expected player/responder actions. It contains descriptions of the simulated emergency situation, including the overall sequence of events, details, supporting data, and timing of activities.

The scenario reflects current facility/site- or activity specific hazards, correlates technically with the EPHA, and is technically accurate in terms of operations, radiological, chemical, and meteorological data. A unique scenario should be developed for each exercise to prevent player/responder anticipation of events and to ensure a valid test of integrated response capabilities.

E. *Rules of Conduct.* Design and development guidelines are established for each exercise and include:

- Limitations are management policies and guidelines of concern to the exercise developers and scenario designers; include issues such as conducting exercises on weekends, overtime restrictions or authorizations, and financial constraints.
- Protocols (ground rules or rules of conduct) remind players/responders of drillsmanship and safety issues.
- Pre-approved simulations list the major simulations applicable to the exercise; may include pre-determined meteorological data, response vehicle red lights, simulating road blocks without interfering or disrupting public traffic patterns, use of water to simulate a chemical liquid hazardous materials spill, use of a smoke generator to simulate fire/smoke, use of protective equipment, simulated operation of systems/equipment, and photographs to simulate equipment damage.

F. *Safety Issues.* Safety of personnel and the facility is paramount during exercises. A major concept of DOE Integrated Safety Management (ISM) is the integration of safety awareness and good practices into all aspects of work conducted at DOE. Simply stated, exercises should be conducted in such a manner that protects workers and other people, and does not cause harm to the environment. Safety is an integral part of each exercise; it is not a stand-alone program.

The planning process and management of exercises must ensure that sufficient precautions and limitations are established and followed for safe conduct of the exercise. A person with the sole responsibility for ensuring safety during the exercise, such as an exercise safety director, should be appointed to the exercise planning team.

During an exercise, all participants must comply with established safety rules and practices. Participants must understand that safety of exercise participants, non-participants, the public, and the environment is the highest priority. An exercise safety plan is an effective method of documenting safety concerns and solutions. The plan should address generic and specific safety concerns, solutions for mitigating the problem, and required actions or notifications if a safety concern or emergency occurs during an exercise.

- G. *Security and Access Planning.*** Adherence to security requirements by all participants in all phases of an exercise is a necessity. Planning and management of exercises should include provisions for the participation of appropriate security personnel and should establish parameters for exercise design, development, and conduct in view of identified security issues. Controllers are responsible for conducting the exercise within security limitations.

Persons involved in exercise planning must be sensitive to information or activities that may have security implications. An exercise security plan is an effective method of documenting security concerns and solutions. This plan should address generic and specific security concerns, mitigative solutions, and required actions/notifications if a security problem or emergency occurs during the exercise. Special provisions should be made for visitors and observers since they may not be familiar with DOE or site security requirements.

- H. *Public Information Planning.*** Scheduled exercises, especially large scale operations-based exercises, should be coordinated with the media and announced to the public. Interfaces with the public and offsite Tribal, State, and local authorities require management awareness and sensitivity.

The public typically has no involvement or participation in an exercise. However, all exercises conducted at a facility/site that have the potential to affect the offsite population, either directly or indirectly, should include adequate provisions to prevent public concern, rumor, or inconvenience. The planning process and the management of exercises should provide for the development of a public information/education plan to coordinate activities with appropriate offsite Tribal, State, and local authorities, the media, and the public. This plan should be developed early in the planning process to ensure coordination with interested offsite authorities/ officials.

- I. *Timeline of Key Scenario Events.*** The exercise timeline should include key scenario events and expected responder actions and, where possible, the events and player/responder actions should be tied to exercise objectives.
- J. *Message Injects.*** Message injects include instructions to controllers to begin simulations, insert information, provide earned information, acting instructions, and contingency messages. Message injects should contain accurate, unambiguous, and non-prompting information and technical data for the players/responders and provide proper direction for the exercise. They should be formatted/presented in a manner as

to reflect the actual data that would be observed by players/responders in a real event (e.g., strip charts, alarm printer output, use of accident mock-ups).

K. *Exercise Data.* Exercise data varies greatly depending on the type and scope of the exercise. For example, the data requirements for a NNX are limited by design in order to minimize the resources needed to conduct this type of exercise. The technical data that supports the scenario, including both general and facility-specific (e.g., operational, radiological, chemical, medical, meteorological), should be technically accurate and clearly and unambiguously presented:

- General facility information is especially important when non-facility personnel participate in the exercise; includes a facility description, (area, site, and facility maps), mission description, emergency management program information, and a description of offsite interfaces.
- Specific facility information provides operational data at the time of the event; may include diagrams, schematics, and data tables that will augment the scenario.
- Meteorological data provides weather conditions and forecasts, both real and simulated, as required.
- Hazardous material data may include radiation or chemical plume plots and tables, decontamination levels, and exposure levels; technical basis and assumptions used to develop this data should be provided.
- Medical information includes a description of medical conditions and moulage procedures, actor behavior instructions, and vital signs.

L. *Exercise Control.* The control organization is responsible for controlling the exercise and is usually depicted on an organizational chart showing the categories of controllers and lines of communication. The categories of controllers include the lead controller, timeline coordinator, area controllers, on-scene controllers (i.e., at the location of the activity to be controlled), the control or simulation cells and their associated actors. Controllers are assigned by name to each position listed in the control organization. The controller assignments should include alternates.

Detailed controller instructions include a schedule of events for all controllers, basic controller instructions, and requirements for each controller assignment. These should include the message injects that the controller is responsible for inserting in the exercise, contingency message injects and the authorization process for their use, and special equipment required for the position. A special type of controller instructions, called profiles, can be used for actors to define roles. Profiles are normally used for media actors in either a control cell or for interviewing in person or for control cell actors representing political figures (profiles are generally used only with experienced controllers).

The **Master Scenario Events List (MSEL)** identifies the timing and summary content of all key events, messages, or injects; contingency messages; and expected responder actions for the duration of the exercise.

Suspension or termination of an exercise is managed through the control organization. Responders are instructed to contact a controller when an unsafe condition exists or when a real emergency is identified. This section details the notification of the control organization, instructions for exercise suspension and re-start, and for exercise termination.

M. *Exercise Evaluation.* Exercise evaluation is conducted by the evaluator organization. The evaluator organization is usually depicted by a chart and description of the categories of evaluators and lines of communication. The categories of evaluators include the lead evaluator, lead area evaluators, and evaluators. Evaluators and alternates are assigned by name and listed in the evaluator organization.

Evaluation criteria provide the standards and activity- or function-specific criteria used to evaluate an exercise. Evaluator modules and/or checklists display the expected response in a time-sequenced format used to monitor player/responder progress. They are based on the exercise objectives, the evaluation criteria, and the participating organization's plans and procedures.

N. *Logistics.* A logistics plan is prepared to specify tasks to be accomplished in support of exercise preparation, conduct, and evaluation. This includes notification of controllers, obtaining meeting rooms and classrooms, identifying and setting up the control cell, communications requirements, meals, transportation, facility security badging/access, and acquiring/staging props (e.g., moulage dummies, smoke generators, damaged equipment, simulated material).

A method to identify exercise participants and, if necessary, various non-participants should be documented in this section. Vests, hats, or armbands of various colors can identify participants. Ensure that the type of participant is printed on the identification method to assist those with color-impaired vision.

O. *Schedule of Events.* A master schedule should be developed that addresses all preparation activities, conduct of the exercise, the critique process, and the evaluation AAR.

P. *Communications Plan.* This plan documents radio and telephone requirements. It provides radio frequencies, protocol, telephone numbers, and directories. Additionally, it contains information concerning controller communications, training, and systems testing. Normally the following exercise telephone (communications) directories are prepared:

- Control Cell Directory provided to responders, which lists the control cell telephone numbers of controllers simulating individuals or organizations

- Controller/Evaluator Directory which includes telephone and radio channels/frequencies used for communication within the control and evaluation organizations
- Responder Directory is provided to control cell controllers and lists the telephone numbers of responders who may need to be contacted by the control cell

Q. *Glossary of Acronyms.* This section contains facility/site- and activity-specific acronyms and definitions for the benefit of personnel who are not familiar with the ERO, operations, and facility/site or activity organization.

3.7.3 Controller and Evaluator Documentation

The **Controller and Evaluator (C/E) Handbook** supplements the EXPLAN by presenting more detailed information about the exercise scenario and describing exercise controller and evaluator roles and responsibilities. The C/E should only be distributed to individuals specifically designated as controllers or evaluators. Larger, more complex exercises may use the Control Staff Instructions (COSIN) and an Evaluation Plan (EVALPLAN) in place of, or to supplement, the C/E handbook.

Controllers ensure that player/responder behavior remains within predefined boundaries. Simulation Cell (SIMCELL) or Control Cell controllers continuously inject scenario elements to simulate real events. Evaluators observe behaviors and compare them against established plans, policies, procedures, and standard practices (if applicable). Safety controllers ensure all activity is executed within a safe environment.

In addition to containing the same information as the EXPLAN, the C/E Handbook usually contains the following sections:

- Detailed scenario information (including agent fact sheets)
- Assignment of personnel to specific controller/evaluator positions
- Roles and responsibilities of functional area or individual controllers and evaluators
- Controller communications plan
- Exercise Evaluation Guides (EEGs)

The **Control Staff Instructions (COSIN)** document contains guidance that controllers, simulators, and evaluators need concerning procedures and responsibilities for exercise control, simulation, and support. COSINs are typically developed for large-scale, complex exercises that require more coordination among control staff. The purpose of a COSIN is to:

- Provide scenario details
- Develop guidelines for control and simulation support

- Explain the exercise concept as it relates to controllers and simulators
- Establish management structure for these activities
- Establish and define the control structure's communication, logistics, and administration

The **Master Scenario Events List (MSEL)** is a chronological timeline of expected actions and scripted events to be injected into exercise play by controllers to generate or prompt player activity. The MSEL ensures that necessary events happen so that all objectives are met. The MSEL links simulation to action, enhances exercise experience for players, and reflects an incident or activity that will prompt players to implement the policy or procedure being tested. Larger, more complex exercises may employ a **Procedural Flow (PROFLOW)**, which differs from the MSEL in that it only contains expected player actions or events.

Each MSEL record contains:

- Designated scenario time
- Event synopsis
- Controller responsible for delivering inject, with controller/evaluator special instructions (if applicable)
- Expected action (player response expected after an MSEL inject is delivered)
- Intended player (agency or individual player for whom the MSEL inject is intended)
- Objective to be demonstrated (if applicable)
- Notes section (for controllers and evaluators to track actual events against those listed in the MSEL, with special instructions for individual controllers and evaluators)

Times listed in an MSEL should reflect the times that injects should occur. These times should be as realistic as possible and should be based on input from functional area representatives. For example, to determine when triage and treatment should be established during the exercise, solicit input from emergency medical services (EMS) or a hospital representative. If the activity occurs sooner than anticipated, the time should be noted but play should not be interrupted.

There are three types of injects:

- Contextual injects are introduced to a player by a controller to help build the contemporary operating environment. For example, if the exercise objectives include information sharing, an MSEL inject can be developed to direct a controller to select an actor to portray a suspect. The inject message would then instruct the controller to

prompt another actor to approach a security officer and inform him/her that this person was behaving suspiciously.

- Earned information injects contain data to be provided to a responder when the function being performed would yield specific information. For example, when Emergency Medical Service (EMS) technician(s) begins to treat a patient, vital signs are provided through these injects when the proper actions to earn them have been achieved. If the EMS does not perform the appropriate actions, no inject information is provided.
- Contingency injects are events that should be verbally provided to a player by a controller if they do not take place. Use of contingency injects during the exercise should be documented. For example, if a simulated secondary explosive device is placed at an incident scene but is not discovered, a controller may want to prompt an actor to approach a player/ first responder and say that he/she witnessed suspicious activity close to the device location. This should prompt the discovery of the device by the responder and result in subsequent notification of protective force (perhaps, specifically, the bomb squad).

MSELs are typically produced in two formats, short and long. Short MSELs list: injects, the time, a short description, the responsible controller, and a player. These can be used as a quick reference guide during exercise play. Long MSELs are used when greater detail is necessary; they include more detailed descriptions, exact quotes for SIMCELL injects, and descriptions of expected actions.

Message injects are typically used in exercises that involve multiple simulated activities. These messages are typically delivered via a SIMCELL and are used to simulate the actions, activities, and conversations of an individual, agency, or organization that is not participating in the exercise but that would likely be actively involved during a real event. For example, in an exercise with limited scope, the State Governor's office may not be playing. To simulate the activities of the Governor's office during an emergency event, a message can be scripted to simulate notification of the mayor. That message can be delivered by phone through the SIMCELL. This script or message inject should be read by a simulator acting on behalf of the Governor's office.

Evaluation Plans (EVALPLANS) provide evaluation staff with guidance and instructions on the evaluation or observation methodology to be used as well as essential materials required to execute their specific functions. During larger, more complex exercises, planners may develop an EVALPLAN in lieu of, or in addition to, a C/E Handbook. The EVALPLAN is a limited distribution document that evaluators use in conjunction with the EXPLAN and the MSEL. Level of detail varies and can include the following:

- Exercise overview
- Evaluation control organization
- Evaluation methodology and observation techniques

- Evaluator roles and responsibilities
- Evaluation communications plan

Exercise Evaluation Guides (EEGs) are developed to assist in exercise evaluation. They incorporate the critical tasks that should be completed in an exercise. EEGs are intended for use by both experienced evaluators and SMEs who may have little or no exercise evaluation experience. EEGs provide evaluators with information on what they should expect to see at the specific location or in the specific situation. (See Section 3.11)

Controller and Evaluator Packets are provided to controllers and evaluators prior to an exercise. The packets contain materials that they need to carry out their responsibilities. These materials can be extracted from the more detailed information found in the C/E Handbook or the COSIN.

A controller packet should contain:

- Essential C/E Handbook or COSIN information (e.g., scenario and threat/hazard information, communications, safety, exercise staff organization)
- MSEL (including injects for each responsible controller)
- Maps/directions

These materials should be placed in a packet (e.g., folder, notebook) for ease of use during the exercise.

3.8 Exercise Objectives

The success of emergency exercises is largely dependent on the quality of the stated objectives. Exercise objectives provide the basis for developing a meaningful and challenging scenario, as well as a gauge to measure performance of the response elements.

3.8.1 Developing Exercise Objectives

Considerations in developing exercise objectives include the following:

- Primary sources of exercise objectives are the participating organization's emergency plans and procedures. Other sources may include lessons learned from past exercises, the specific plans/procedures being exercised, and job-task analyses used to develop the organizational response structure, requirements, or training.
- A recommended source for the specific exercise objectives to be used in validating and testing components of the response is the set of **performance-based evaluation criteria** contained in Chapter 4, Appendix D of DOE G 151.1-3. Each of the 15 DOE/NNSA emergency management Program Elements has a performance goal

and a set of evaluation criteria that represent the expected performance to achieve that goal. An **individual** criterion or **groups** of criteria can be used as a *single exercise objective*.

- Exercise objectives need to be fully developed for all organizations prior to the preparation of the scenario script. If offsite organizations are participating in the exercise, they should develop their own objectives for evaluation during the exercises and these objectives should be included in the exercise plan. These objectives are not evaluated by the DOE/NNSA evaluators but should be reviewed to ensure that the objectives that rely on site input are attainable and measurable. DOE/NNSA should evaluate the interfaces between DOE/NNSA and the offsite agencies, if this is part of an exercise objective.
- Each exercise objective should clearly state what is to be demonstrated by the responders
 - Is the objective *clearly* stated? It should be specific, focus on the performance to be demonstrated, and be interpreted in the same manner by all participants.
 - Is the objective *attainable*? The performance required in the objective must be attainable (achievable). The function or activity specified must be within the capabilities of the responders to accomplish.
 - Is the objective *measurable*? The performance addressed by the objective should have observable and measurable indicators. Specific evaluation criteria should be developed for measuring performance using a procedure or checklist. The evaluation criteria given in Appendix D and modified to be facility/site-specific can be used for the evaluation of exercise objectives.
- Exercise objectives should contain a condition, an action, and a measurable standard. For example, given an Operational Emergency (*condition*), activate the EOC (*action*), in accordance with the Site EOC Emergency Plan Implementing Procedure (*measurable standard*). The condition provides the evaluator an understanding of the conditions that have to occur prior to the responders taking the action. This allows the evaluator to position him/herself to observe the action. The action should be clearly stated and attainable. This is the function that the evaluator will observe and analyze to report performance. The standard is the plan, procedure, and/or regulatory requirement listing the steps to be taken by responders to meet the exercise objective.
- For purposes of identifying responsibilities, it is useful to categorize or group objectives. Typically objectives may be grouped by geographical area (e.g., event scene, command center, collocated facility), function (e.g., notification, consequence assessment, protective actions, etc.), by organization (e.g., Operating Contractor, operations/field office/service center/Headquarters, state, local organizations, etc.), or by relationship to the DOE facility/site. For example, a grouping by relationship to the DOE/NNSA facility/site could result in a categorization of objectives, as follows:

- Facility/site objectives - involve only site and facility organizational units
- Offsite objectives - involve only offsite units
- Shared objectives - involve coordinated site and offsite units
- Special purpose objectives - designed to accomplish a specific purpose and may involve site and/or offsite units

Using the categories in the example listed above and grouping by organization will assist in identifying the entity responsible for determining the extent of exercise play (the How much?), and, therefore, the organizational unit responsible for preparation of its objectives. Joint objectives will require the collaboration of more than one entity. Special purpose objectives may be prepared to test, for example, a new capability, such as a mutual aid agreement, that would dispatch a medic response unit within a specified time.

Once established, the objectives should clearly define the extent of play (including offsite organizations in the exercise), identify types of events to be included in the scenario, and provide the entire framework on which the exercise will be designed.

3.8.2 Basis for Exercise Objectives

A recommended methodology for developing exercise objectives uses evaluation criteria contained in Appendix D of DOE G 151.1-3 as a basis for specific objectives used to validate and test components of the emergency response. The appendix contains standardized generic evaluation criteria for judging the performance of functions and activities associated with each Program Element.

Appendix D contains standard evaluation criteria for each Program Element. Each criterion is labeled to identify the type(s) of evaluations to which it applies:

- P** - Program Evaluation
- E** - Exercise Evaluation
- P/E** - Program and Exercise Evaluation
- CE** - Conduct of Exercise Evaluation

The **P** criteria can be used for evaluating planning and preparedness activities, and the expected performance of responders during an emergency based on the evaluation of plans, procedures, facilities and equipment, and through interviews with personnel on the ERO. The **E** criteria are used for evaluating the actual, observed performance of responders during an exercise or actual emergency. P/E criteria are appropriate for either Program or Exercise evaluations. **CE** criteria should be used in evaluating the conduct of an exercise.

To use this set of criteria, the specific issue to be validated or tested, the corrective action, improvement item, plan activity, or procedure is matched with one or more of the Appendix D evaluation criteria. This general criterion or criteria becomes the exercise

objective. Accomplishment and evaluation of this general objective will be reflected in the references to specific plans, procedures, or standards that are incorporated in facility/site- or activity-specific evaluation criteria. This approach ensures standardization of exercise objectives and evaluation criteria, while providing a facility-/site- or activity-specific evaluation of the objective.

For example:

Emergency Response Organization (ERO). Validate that the ERO responds within the required timeframe and with the required level of staffing. Applicable evaluation criteria under the program element ERO is:

P/E6.9 The ERO is functionally staffed and activated in a timely manner; key emergency response facilities are operational within an hour after declaration of an OE.

This represents the exercise objective. To produce the criteria for evaluating this objective, specific time and staffing standards located within the facility/site or activity plans and procedures must be accessed. For example, if the procedures state that the ERO is operational within an hour after declaration of an emergency and is functionally staffed when certain specified ERO members arrive, then these become the evaluation standards to incorporate in P/E6.9.

3.9 Exercise Preparation

Pre-exercise activities include configuring props or staging equipment, establishing controller and evaluator communications, specifying safety and security precautions, making arrangements to feed participants, and making arrangements for minimizing the impact on non-participants and ongoing operations.

Coordination among participants prior to the exercise should include provisions for exercise initiation, interruption, and termination. All participants (players, controllers, and evaluators) should be reminded of their responsibility to prevent unsafe acts and to stop the exercise, if necessary, to ensure that they do not occur.

3.9.1 Controller and Evaluator Training

Generic Training. Generic training should be developed and conducted for individuals participating as controllers and evaluators in an exercise. This training should include both initial training and a periodic refresher prior to each exercise.

- Individuals with experience in the control and evaluation of exercises should provide the initial training. It should include a classroom-type presentation and discussions of correct controller/evaluator performance in various exercise circumstances.
- Classroom-type presentation should address all aspects of an exercise and include such topics as objectives, safety, participants, realism, simulation, free play,

contingency messages, earned information, prompting, and the evaluator and controller-responder interface. Discussions should provide examples of circumstances that may occur during an exercise with proper controller actions. Emphasis should be placed on the criteria for controllers to intercede in responder actions and the criteria for suspending or terminating the exercise.

Exercise-Specific Training. Just prior to any exercise, all controllers and evaluators must receive a briefing on the scenario package and the specific duties they are to perform. This may include a presentation on the various plans and procedures that the responders are expected to use. Controller briefings should cover the entire scenario and anticipated responder actions, the location and assignments of each controller (including actors), communication plans, administrative and logistical details, an in-depth presentation of safety and security issues, and an in-depth discussion of each controller's specific assignments. Details for controlling complex or sensitive parts of the exercise should be presented in the briefing. A tour of locations and associated equipment involved in the exercise may be performed as part of the briefing; this may **NOT** occur if a tour will result in compromise of the exercise.

NOTE. In preparing for an NNX, a tour of locations and associated equipment involved in the exercise may NOT occur if a tour will result in compromise of the NNX. In this case, a limited tour may be conducted during an earlier visit, thereby not compromising the NNX program. In some cases, the NNX team will not arrive on site or be seen until the implementation of the NNX. It is at the discretion of the NNX Lead Evaluator to conduct any controller/evaluator in-briefs offsite to avoid the possibility of compromising the NNX.

3.9.2 Responder and Observer Briefings

Responder Briefing. Should not include information related to the scenario. Responders shall be briefed regarding rules of conduct; scope of the exercise; safety and security precautions; approved simulations; methods for identifying various exercise participants; and any special administrative, logistical, or communications arrangements in effect during the exercise. Briefing pre-approved simulations must be carefully considered, since some may be very scenario-specific and may divulge too much advance information.

NOTE. Because an NNX is an unannounced exercise, there is **no** pre-exercise responder briefing. During conduct of the NNX (at the first slow down during responder actions), the NNX Lead Evaluator will conduct a short brief to all participants (players, controllers, and evaluators) of the sponsorship and purpose of this NNX, as well as remind them of their responsibility to prevent unsafe acts and to stop the NNX, if necessary, to ensure an unsafe act does not occur.

Observer Briefing. Should occur prior to the exercise to ensure compliance with safety and security precautions and other rules of conduct. Observers may attend the controller briefing or may be provided separate briefings.

3.9.3 Exercise Setup

Exercise setup should be documented in the logistics plan and includes setting up simulations, preparation of scenes and visual areas (e.g., smoke generators, simulated spills, actor moulage, etc.), performing controller communications checks, positioning controllers/evaluators, conducting responder initial conditions briefings, synchronizing clocks, initializing computer simulation data, and other scenario-specific activities. Exercise setup should be carefully planned to ensure that all logistics necessary to conduct the exercise are checked before the exercise begins. Security of the exercise scenario must be properly managed; pre-staging of players and/or prior knowledge of scenario material by players must be effectively prevented.

3.10 Conduct of the Exercise

Control of the exercise ensures that the scenario unfolds according to the exercise plan. Controllers are responsible for staffing and positioning themselves for effective control. They must ensure there is no interference or prompting by non-responders. Players/responders must perform their respective functions, initially and throughout the exercise, in a professional manner as if the situation were an actual emergency. Simulation of activities during the exercise must be sufficiently realistic to provide confidence that the activity could have been performed during a real emergency.

3.10.1 Roles of Participants

Exercise Director. During the exercise, the exercise director is responsible for the following:

- Safe conduct
- Coordination and continuity
- Providing the opportunity to meet exercise objectives
- Commencing, suspending and terminating the exercise

Controllers. Controllers provide overall direction and control of the exercise. They are primarily responsible for ensuring continuity of the scenario and maintaining safety and security precautions. Controllers should do the following:

- Review appropriate emergency response plans, procedures, and checklists prior to the exercise.
- Review safety, security, communications, and logistical plans included in the exercise plan.
- Attend required training and briefing sessions.
- Allow freedom of responder decisions and actions (i.e., free play) to demonstrate exercise objectives and response capabilities.

- Preclude responder decisions or control actions that would result in loss of opportunity for a participating organization to meet its objectives.
- Inject approved contingency messages or provide instructions, as needed, to keep the exercise on track with the scenario.
- Preclude responder decisions and control actions that may compromise safety or security of the facility, personnel, or equipment.
- Refrain from prompting, in any fashion, decisions or actions of responders.
- Keep the lead controller informed of significant unplanned activities.
- Be prepared to suspend exercise activities in the immediate area and to use pre-arranged protocols to terminate an exercise.

Evaluators. In general, the only function performed by an evaluator during the exercise is to observe and document the responder actions; however, in some circumstances, because of limitations on available personnel or financial resources, evaluators may perform a dual role of evaluator/controller. Formal evaluation is performed after the exercise is terminated. Evaluators should be assigned specific locations or specific exercise functions. Evaluators should do the following:

- Review appropriate emergency response plans, procedures, and checklists prior to the exercise.
- Review appropriate plans (e.g., safety, security, communications, and logistical plans) developed for conduct of the exercise.
- Attend required training and briefing sessions.
- Observe performance of responders during the exercise and document their actions using their evaluator modules or checklists.
- Refrain from interfacing with responders to prevent interrupting or prompting.
- Evaluate responder performance (not the person) and adequacy of procedures, facilities, and equipment based on exercise-specific evaluation criteria and evaluator checklists.
- Document errors and problem areas in the scenario or conduct of the exercise.
- Maintain a time line of the events as they unfold.
- Present their evaluations and recommendations in a formal critique.

Observers. Observers should not interfere with or become involved in any exercise activity, nor should they contribute information or opinions to responders in any fashion.

Responders. Responders represent the majority of participants in an exercise. In addition to site DOE/NNSA and contractor emergency response personnel, responders may include personnel from DOE/NNSA Headquarters, DOE/NNSA Operations/Field Elements and service centers, and various other DOE/NNSA elements; Federal agencies; state, tribal, local, and private organizations; and the media.

Non-Participants. Non-participants are individuals outside the scope of play who will continue to perform their normal, routine duties as though the exercise is not in progress. Such routine duties include activities necessary for continued safe and secure operation of the facility. Efforts should be made to minimize the impact of the exercise on non-participants and to avoid interface between responders and those individuals.

3.10.2 Conduct

This section discusses various aspects of exercise conduct that ensure that the exercise represents a valid test of performance of the response capabilities in achieving the exercise objectives.

Confidentiality. Scenario information should be closely guarded and not discussed with potential responders. Guidelines for maintaining exercise confidentiality include the following:

- Controllers/evaluators should be careful of *what* they say and to whom they speak about the exercise because they may be overheard; this includes conversations over radio net communications.
- Controllers/evaluators should be careful when positioning themselves to observe an activity to ensure they do not give away information by their actions.
- Controllers/evaluators should take care that no one can see their scenario notebooks or comments. They should never lay their scenarios, notes, or messages in a location where responders can read them.

Simulation and Realism. Realism should be emphasized throughout any exercise.

- Exercises should be managed to be as realistic as possible. Exercises should attempt to duplicate the sense of stress inherent in a real emergency situation while, at the same time, ensuring safety of personnel and security of the facility.
- Exercise responders should receive scenario information only when it is earned via demonstration of the particular role and its response to the event.
- Simulation should be kept to a minimum. During responder briefings, responders should be briefed on which functions/activities are simulated.

- A control cell should be used whenever it is necessary for responders to interact with entities not participating in the exercise. The control cell is located away from responders and is staffed by experienced professionals who simulate or role-play nonparticipating organizations. This method of simulation enables realistic interactions to occur between the exercise responders and those they would expect to interact with during the course of an actual response.
- Actors/role-players (controllers) should be used to simulate personnel who would actually be encountered by responders if the scenario were real. Actors may come in face-to-face contact with the responders or may be members of a control cell.
- Responders should implement their appropriate plans, procedures, and training to respond as if the scenario information is real. Responders should rely upon the controllers or exercise simulation tools to supply scenario information.

Presentation of Scenario Information. Data and evidence should be presented to the responders as it would be found, measured, or indicated, with a maximum degree of realism.

- Information should be provided to responders only when it is earned through their observations, correct use of procedures, and correct reading and use of instrumentation. For authenticity, data sheets, recorder charts, and instrument output information should be provided wherever possible in the scenario.
- Time-related parameters should be provided to responders at the time identified on messages to ensure progress of the scenario timeline.
- If responders require clarification (i.e., a reasonable request) about a particular message or visual cue, the controller should provide such data/information as accurately as possible considering simulated time and scenario conditions, then advise the Lead Controller/Evaluator of their inject.
- If controllers need to create additional information (e.g., the message was incomplete) or do not know the information required, they should use pre-arranged protocols (e.g., obtain area controller or lead controller permission) to formulate a response.

Free Play. Free play allows responders to make decisions and take actions they consider appropriate to the response. Realism is enhanced and responder motivation is improved when responders are provided the latitude to make decisions and take actions that may differ from those anticipated during the scenario development.

- The key management aspect of free play is to allow such actions to occur, but to preclude actions by responders that would do the following:
 - Jeopardize personnel safety
 - Jeopardize facility/site safety

- Compromise security
 - Interfere with the scenario
 - Exceed established exercise scope or limitations
 - Preclude exercise objectives from being demonstrated
- During exercises, responders may interject innovative, unexpected response solutions or actions that can be accommodated by the scenario. In such situations, the controllers should allow the responders to proceed with their actions and notify the exercise lead controller that a deviation is occurring. If the responder actions compromise safety or security, or limit demonstration of stated exercise objectives, the controller should note the intended action but preclude that intended action from actually occurring. This information should be reported to the evaluator.
 - Actual equipment and procedural problems that are identified during the exercise interject a form of free play. Solutions to actual equipment or procedural problems on a real-time basis afford a valuable evaluation of the conduct of operation, training, and safety culture of the responders. Controllers should allow responders to solve such actual problems unless safety, security, or demonstration of exercise objectives may be compromised.

Prompting. Explicit instructions should be given to all participants to avoid prompting during an exercise. Prompting occurs when responders are provided advance scenario-related information or guidance regarding appropriate response actions. Prompting may result from either unintentional or intentional action by controllers, evaluators, or observers.

Communications. All written and verbal communications among participants should be clearly identified as exercise information and all message transmissions should begin and end with the statement:

“THIS IS AN EXERCISE.”

Because offsite parties can monitor radio and cellular telephone transmissions, personal information such as the names or phone numbers of individuals should never be transmitted. All communications should be in compliance with security practices.

3.11 Exercise Evaluation

Evaluation and critique of the exercise provide feedback to resolve deficiencies and incorporate improvements in the emergency management program. A well-planned, structured evaluation is essential for performing a valid test of the emergency response capabilities of the program. In this section, the planning and organization of an evaluation of an operations-based exercise will be described. This will be followed by a discussion of the evaluation process.

3.11.1 Planning and Organization of the Evaluation

The following steps should be implemented to effectively plan for an operations-based exercise evaluation:

- Define evaluation requirements. Determine what will be evaluated and where the observations will occur.
- Prepare the EVALPLAN. Prepare the complete package of information on the evaluation process.
- Develop evaluation tools. Develop the forms evaluators will use to capture information for evaluation during the exercise observation.
- Recruit, assign, and train evaluators. Determine the necessary qualifications of evaluators, identify appropriate individuals, obtain commitments from those individuals, and train them.
- Finalize the evaluation plan. Undertake the activities necessary to organize the evaluation just before the exercise.

Define Evaluation Requirements. While the exercise is being designed, the evaluation planning team will be provided, via the EXPLAN, the MSEL, and other exercise documents, with information on:

- Exercise goals and objectives
- Exercise flow
- Critical actions
- Exercise participants
- Functions and activities to be evaluated

The evaluation planning team will use this information to plan the evaluation, as follows:

Step 1: The evaluation planning team will first use the exercise goals and objectives to determine what performance outcomes should be evaluated.

Step 2: Once the outcomes to be evaluated are determined, the team identifies what activities should be evaluated.

Step 3: Based on these activities, the team identifies which functions (e.g., individuals, teams, disciplines, and organizations) should be evaluated.

Step 4: From the functions, the evaluation planning team can identify where the observations should take place (i.e., what locations) and which specific tasks should be evaluated.

Step 5: From the tasks to be evaluated, the planning team should develop the guidelines within the objectives and criteria for meeting an objective when criteria are only partially met.

Step 6: Once these steps have been completed, the evaluation planning team can identify or develop the appropriate evaluation tools for the evaluators to use.

Prepare the EVALPLAN. The planning for an evaluation is incorporated in an EVALPLAN, which consists of the following:

- Exercise-specific information: The EVALPLAN should include the scenario, the map of the play site (including evaluation locations), and the exercise schedule (including the evaluation schedule).
- Evaluator team organization, assignments, and location: The EVALPLAN should identify how many evaluators are needed, where they will be located, and how they are organized. Evaluators cannot see everything that occurs at any one location during a response. Yet, during the exercise, evaluators must be able to capture information that provides insight into how effective each group is as well as how well they operate with each other. Thus, location and number of evaluators are crucial to the data collection process.
- Evaluator instructions: Evaluators should be given instructions on what to do before they arrive (e.g., review exercise materials, jurisdictional plans and procedures, and the EVALPLAN) as well as how to proceed upon arrival.
- Evaluation tools: The EVALPLAN should include the data collection instruments and guides as discussed below.

Develop Evaluation Tools. Once the evaluation planning team has determined what will be evaluated and where the observations will occur, specific evaluation tools are developed for use in the data collection and analysis. The **Exercise Evaluation Guides (EEGs)** are developed to assist in exercise evaluation. The facility/site- or activity-specific plans and procedures are used to describe the expected response to be evaluated for each exercise objective. EEGs provide evaluators with information on what they should expect to see at the specific location or in the specific situation. The EEG should provide the evaluator with the important parameters and actions to look for in observing the activities. Guidance is provided for determining whether the objective is met. Space in the EEG should be provided to record observations; a checklist format might be useful to link observations with the parameters and actions required in plans/procedures. Questions to address after the exercise can also be recorded in the EEG.

Recruit, Assign, and Train Evaluators. Selection, recruitment, and assignment of evaluators are crucial components of exercise design. The individual primarily responsible for these tasks is the Lead Evaluator. Other members of the evaluation planning team may assist the Lead Evaluator in this task.

The EXPLAN, which is developed by the exercise planning team, serves as the basis for determining the number and expertise of evaluators needed for the exercise. This document will define the scope and concept of play for the exercise. It describes the response tasks that will be demonstrated by exercise players and indicates whether simulations will be used for nonparticipating organizations. It also identifies exercise locations such as emergency operations centers, medical facilities, decontamination sites, and field locations.

The Lead Evaluator plays a critical role in operations-based exercises and should be identified early in the process to fully participate as a member of the exercise planning team. The Lead Evaluator should be a senior-level person who understands command and decision-making processes and interagency coordination, as well as specific response functions. Exercises with play in multiple sites will need an Evaluation Team Leader for each site.

A number of evaluators will also be needed to observe and record player performance during the exercise. Evaluators should be chosen for their knowledge and understanding of the specific functional area they will be assigned to observe. Evaluators should be assigned to monitor all participating organizations and player locations. The following guidelines will help participants determine the number of evaluators that are needed:

- *Field response.* A minimum of one evaluator for each function evaluated (e.g., incident command, decontamination, and emergency medical services); additional evaluators are needed for functions that involve multiple activities that take place simultaneously or activities that take place in multiple locations.
- *Hospitals/Medical Facilities.* A minimum of three to five evaluators at each participating medical facility, depending on size and expected patient/victim flow; additional evaluators are needed for functions that involve multiple activities taking place simultaneously or activities taking place in multiple locations.
- *EOC.* A minimum of three to five evaluators at each participating facility, depending on the size and organizational structure of the EOC.
- *Joint Information Center (JIC).* Depending on the expected number of participants at the JIC, one or two evaluators may be sufficient.

Additional evaluators would be needed for a large exercise with many players performing a function in a single location or for each location when the function is performed at multiple sites.

Generally, exercise evaluators will be peer reviewers identified by reaching out to other facilities on a site, to other DOE/NNSA sites, or to DOE/NNSA Headquarters offices. Independent evaluators who can assist in monitoring compliance may also supplement this peer review approach. Potential evaluators may be identified from multiple sources, including following:

- Members of the Exercise Design Team, who are fully versed in the scenario, players, and expected action, are a good source for evaluators (if they are not already committed to other duties during the exercises).
- Experienced members of participating organizations and the ERO who are not involved in the play are a good choice for evaluators because they are familiar with the organizations, plans, and procedures.
- Professionals in similar agencies in adjacent or nearby jurisdictions can be a source for evaluators, especially when all of the participating jurisdiction's members of a specialized function, such as a Hazardous Materials (HAZMAT) team, are involved in the exercise.
- DOE/NNSA and contractor employees from other DOE/NNSA facilities and/or sites might be available with sufficient notice.

Although service as an evaluator requires a considerable commitment of time, evaluators and their agencies can expect to gain significant benefit from the peer evaluation process. For example, observing other locations exercising their emergency response plans may help evaluators gain insight into best practices or other ways to provide emergency response, which could benefit their own communities.

Evaluators are expected to be available for the pre-exercise training and briefing/site visit, the exercise itself, the post-exercise hot wash, and the data analysis and contribution to the AAR. This time commitment is usually equivalent to one day before the exercise, the exercise day(s), and one day after the exercise. One or more of the evaluators may devote additional time to drafting the AAR and briefing participant organizations and their management on findings and recommendations.

3.11.2 Evaluation Process

Information is gathered and documented by the evaluators. Evaluators assess the performance of the ERO and adequacy of equipment, facilities, and resource documents used by the responders. The assessment consists of a comparison of performance against predetermined and documented facility/site- or activity-specific evaluation criteria based on program-specific plans/procedures. Information from the evaluation and critique processes provides feedback for use in identifying corrective actions and improvements to the emergency management program.

The evaluator organization must be sufficiently staffed to evaluate the performance and key decision-making of the responders in satisfying the exercise objectives. Evaluators should be familiar with responder organizations, functions, procedures, and anticipated responder decisions and response activities in order to accurately monitor activities and functions performed by the players.

Responders/players are evaluated with respect to their demonstrated proficiency in their respective responsibilities and functions, communication and coordination with other

responders, familiarity and use of applicable procedures and equipment, and overall professional response. Facilities and equipment are evaluated with respect to adequacy of functions/operability. Procedures are evaluated with respect to their use by responders, specifically, their adequacy of content for the tasks performed. Notifications and communications are evaluated during every exercise. When offsite agencies participate, interfaces with offsite agencies are evaluated.

The following overview describes the steps in the exercise evaluation process for operations-based exercises, not including auxiliary activities such as development of the evaluation tools or training for evaluators.

Step 1: Plan and organize the evaluation. As part of the exercise planning and development process, the exercise planning team will determine what information should be collected, who will collect it, and how it will be collected.

Step 2: Observe the exercise and collect data. Expert (peer) evaluators collect data by recording their observations during exercise play and collecting additional data from records and logs. Evaluators of tabletop exercises record discussion and review documents such as plans, procedures, and interagency agreements.

Step 3: Analyze data. The analysis phase should answer the following questions about the exercise play:

What happened?

What was supposed to happen?

If there is a difference, why is there a difference?

What is the effect of that difference?

What should be learned from this?

What improvement should be made or exemplary practices adopted?

The first step in the analysis process is a player hot wash, i.e., a short discussion session immediately following the exercise to get player feedback.

Analysis of exercises is conducted using data collected to reconstruct the timeline of events as they occurred, an approach similar to reconstruction of events that most agencies do following an accident or other type of incident. This information is then used to identify and explore the differences between what happened and what was supposed to happen to ascertain the root causes for the differences.

Step 4: Develop the DRAFT AAR. As part of the analysis phase, the evaluation team drafts the AAR, which provides a description of what happened, exemplary practices, issues that need to be addressed, and recommendations for improvements.

The evaluators share the assessment information with management and, if appropriate, facilitate identification of improvements that can be made. This phase of the Exercise Evaluation and Improvement Process generally consists of the following steps.

Step 5: Conduct Exercise Debrief meeting. The exercise planners and/or evaluation team will present their analysis findings and recommendations in an Exercise Debrief meeting with management from the sites, facilities, departments, agencies and jurisdictions that participated in the exercise. They will also solicit feedback and validation from the attendees on their observations and recommendations.

Step 6: Identify improvements to be implemented. Much of the Exercise Debrief meeting will be devoted to discussing specific actions that the exercise participants will take to address the opportunities for improvement contained in the recommendations in the draft AAR. This list of actions, referred to as the Improvement Plan (IP), identifies what will be done, who (person, department or agency) is responsible, and the timeframe for implementation. Although the IP is a written document, it should be viewed not as a static document but as a dynamic program that is updated and modified regularly in a constant cycle of improvement.

Step 7: Finalize the AAR. Following the Exercise Debrief meeting, the evaluation team should finalize the AAR by incorporating any corrections or clarifications related to the observations or recommendations as well as the improvement steps that will be taken. Some of the actions may include only the preliminary step of a multi-step activity (e.g., create a committee to review the issue and make recommendations for further action).

3.11.3 Critiques

Formal critiques are conducted after the exercise to provide a forum in which the exercise results can be addressed and discussed among the participants. This can result in the identification of “lessons learned” for improving the response to an emergency. For large-scope exercises, it may be necessary to conduct several critiques to ensure that all participants are given the opportunity to take part.

Responder “hotwash” critiques are conducted immediately following the exercise to provide an opportunity for players/responders to discuss their own perspectives on the activities and events. These critiques are typically conducted “in place” (e.g., incident command post, field teams, EOC) by the area lead responder or controller.

A formal verbal critique is conducted following each exercise and should include participation by all controllers and evaluators. This critique should provide the forum for discussion and correlation of individual observations, formulation of exercise findings, determination of objectives demonstrated, and determination of overall exercise performance. Recommendations for corrective and improvement actions should be addressed. The product of this critique provides the framework for the senior management critique (plus any exit meeting) and the exercise AAR.

Key participants, including manager-level responders, the Exercise Director, the lead controller(s), and the lead evaluator(s), should attend a senior management-level critique. Overall exercise performance, significant observations, findings, and preliminary corrective actions and improvement items may be addressed. For exercises evaluated by an external organization, an “exit/closeout” meeting may be conducted for DOE/NNSA and facility/site management.

Critiques should accomplish the following:

- Be conducted in a questioning, objective manner to maximize the benefit and learning experience from each exercise.
- Include a review of scenario events, identification of shortcomings in the scenario or exercise conduct, and analysis of expected and actual responder actions.
- Discuss responder performance, the adequacy of procedures and other documentation, and the adequacy of facilities and equipment.
- Provide the basis for documentation of findings to facilitate identification of corrective actions and improvement items for upgrading the emergency management program.

3.12 Follow-up Activities

3.12.1 Corrective Actions and Improvement Items

Findings resulting from the exercise should be subject to an in-depth review. For recurring problems, a root cause analysis should be performed. A plan should be developed to implement corrective actions and improvement items. Management should budget, schedule, and implement the actions to upgrade the emergency management program. Activities should be coordinated with affected organizations. Corrective actions, such as procedural modifications, necessitate timely feedback to the participants. Such timely feedback demonstrates management attention and concern for upgrading the emergency response capability and demonstrates management support for involvement of participants in exercises.

3.12.2 Maintaining Records

Auditable records should be prepared and maintained for each exercise. Long-range planning information such as exercise objectives, schedules, and the exercise AAR are considered auditable records. Records that may be maintained include the following:

- Training records
- Participant rosters
- Exercise participant packages
- Critique minutes or summaries

- Completed evaluator modules or checklists
- Final report
- Accounting summary

APPENDIX B. Controller and Evaluator Manual

B.1 Introduction

The purpose of the Controller and Evaluator Manual is to prepare DOE/NNSA controllers and evaluators to effectively perform assigned duties and functions during emergency management exercises. It provides pertinent information concerning the exercise development, control, and evaluation processes, and details specific controller and evaluator responsibilities before, during, and after an exercise. This Manual:

- Augments DOE G 151.1-3, Chapter 3
- Details the roles of controllers and evaluators in exercises
- Explains the materials used by controllers and evaluators
- Provides techniques on how to effectively perform the controller and evaluator functions

Section B.2 provides an overview of the exercise organization and participant selection and responsibilities. Section B.3 details controller activities, while Section B.4 is dedicated to evaluator activities. Controllers and evaluators may only need to review the section that applies to their assigned functions during the exercise. However, individuals assigned to both controller and evaluator roles should read the section in its entirety. Section B.5 provides information relative to the exercise critique and evaluation process that is applicable to both controllers and evaluators. The After Action Report (AAR) is addressed in Section B.6.

B.2 Exercise Organization and Participants

The exercise organization consists of the following participants: the Exercise Director, responders, controllers, evaluators, and observers. Each participant performs specific assignments and roles as summarized below:

- **Exercise Director.** The senior exercise official who has primary authority and overall responsibility for the design, development, control, and evaluation of the exercise.
- **Controllers.** Provide direction and control of the exercise. They monitor the sequence of events as they unfold, and are responsible for exercise safety within their span of control. Individual controllers may initiate certain actions in order to ensure the continuity of events described in the exercise scenario. It is their responsibility to ensure that responders *do not* respond in a manner that might jeopardize safety and that responders remain focused on exercise play that demonstrates the exercise objectives. The control organization will vary in number depending on the exercise scope and may include the following controller positions.

- **Senior controller.** Responsible for coordination and oversight of all other controllers.
- **Lead controllers.** May be used to coordinate the activities of several controllers for larger or more complicated exercises that involve a number of response locations and emergency functions. Controller teams may be organized by location, function, or a combination of both depending on the needs of the exercise. However, controller team leaders should have previous experience as an exercise controller before they are selected to lead a team.
- **Control cell.** A simulation center located away from the responders. Staffed by experienced controllers (and/or actors) who simulate or role-play non-participating organizations by providing input to responders, via telephone, on behalf of any non-participating individuals, companies, offsite agencies, or Emergency Response Organization (ERO) members who would normally be involved in responding to an emergency. Role-players in a control cell are subject to evaluation of their performance just like any other exercise controller.
- **Timeline coordinator.** For complex exercises, is responsible for ensuring the exercise timeline remains on schedule—a key factor for proper attainment of exercise objectives. Should exercise play cause deviation from or a delay in the timeline, it becomes necessary to use previously prepared contingency materials. The timeline coordinator, typically co-located with the Exercise Director, is responsible for specific tasks or actions from the control cell. The timeline coordinator receives timeline status reports from lead controllers and provides this information to the senior controller and Exercise Director.
- **Actors/role-players.** Controllers who simulate members of non-participating organizations and role-play key individuals, such as injured personnel. They may have face-to-face contact with responders, functioning as media reporters, next-of-kin, or injured personnel. They may be members of a control cell with telephone communication being the only interaction with responders.
- **Evaluators.** Document and evaluate responder performance and adequacy of facilities and equipment against established emergency plan/procedures and exercise evaluation criteria. Evaluators are unbiased, objective, technical or functional experts. The evaluator organization will vary in number depending on the exercise scope and may include the following evaluator positions.
- **Senior evaluator.** Responsible for the coordination of all evaluation functions including preparation of the AAR that identifies findings and recommends corrective actions.
- **Lead evaluators.** May be used to coordinate activities of several evaluators for larger or more complicated exercises that involve a number of response locations and emergency functions. Evaluator teams may be organized by location, function, or a

combination of both, depending on the needs of the exercise. Evaluation team leaders are responsible for the coordination of a team of evaluators assigned to particular locations and/or similar response functions. As with the control organizations, evaluation team leaders should be selected on the basis of previous experience and demonstrated ability to successfully perform as an evaluator.

- **Responders.** Often referred to as “players,” usually comprise the majority of participants in the exercise. It is their responsibility to take the necessary actions to mitigate the simulated emergency and thus demonstrate the ability to ensure the safety of workers, the public, and the environment, in accordance with established emergency plans and procedures.
- **Observers.** May be present to observe the exercise for either official or educational purposes. Attendance of observers at an exercise, their locations, and rules of conduct should be determined by the Exercise Director. Observers should not interact with responders, contribute information or opinions, or interfere with the exercise in any other way. Observers should direct all questions or comments related to the exercise to the area controller or their escort, if appropriate. Although they may have prior knowledge of the scenario, observers should be reminded of the responsibility for withholding that information from the responders.
- **Video teams and still photographers.** Considered observers for exercise purposes, may be used to document the exercise. These teams may film, record, and photograph response activities, as long as they do not interfere with exercise play.

B.2.1 Selection of Controllers and Evaluators

Controller and evaluator functions generally should not be combined. Each role has specific responsibilities that require total concentration to be performed effectively. If circumstances require that an individual be assigned to both roles, that individual must have a thorough understanding of controller/evaluator requirements and responsibilities.

Individuals who fill controller positions should have extensive emergency management experience and have participated in a variety of tabletops, drills, and exercises, so they know what behaviors and actions to expect from responders. Controllers should participate in several exercises to provide continuity and consistency. Personnel who serve as controllers should be knowledgeable concerning the updates and upgrades to the emergency plans and implementation procedures that will be demonstrated at their locations during the exercise.

Evaluators are selected based on their knowledge of the functions they are to evaluate and their experience with them. It is important that they are technically competent to judge the actions of the responders. Wherever possible, their experience should be equal to or greater than that of the responders in their assigned area.

The conduct of effective emergency exercises depends on the selection and assignment of top-quality controllers and evaluators. Although these individuals may be drawn from

non-participating areas of a response organization, care should be taken to ensure that use of these personnel to support the exercise does not compromise the effectiveness of the response organization.

B.2.2 Responsibilities of Controllers and Evaluators

Controllers.

Controllers are primarily responsible for ensuring the continuity of the scenario and maintaining safety and security.

Controllers play a crucial role throughout the exercise process. Their first and most important function is to maintain exercise safety. They maintain the sequence of events and control the flow of message injects. Controllers are responsible for the overall conduct of the exercise. They are in a unique position to view exercise play, understand the dynamics of an action or activity as it unfolds, and comment on what they observe. Controllers **do** interact with the responders. Controllers provide scenario information to responders as it is earned and may be tasked to inject approved contingency messages to keep the exercise on track with the scenario and exercise timeline. Controllers should do the following:

- Prior to the exercise, review appropriate Emergency Plans, procedures, and documents.
- Prior to the exercise, review appropriate Exercise Plan (EXPLAN) materials, including objectives, scenario, messages, Safety and Security Plans, and controller instructions.
- Attend required training and briefing sessions.
- Conduct the exercise by providing applicable scenario information to responders.
- Allow freedom of responder decisions and actions (i.e., free play) to demonstrate exercise objectives and response capabilities.
- Inject approved contingency messages or provide instructions, as needed, to keep the exercise on track with the scenario.
- Preclude responder decisions and control actions that may compromise the safety or security of personnel or the facility.
- Refrain from prompting, in any fashion, the decisions or actions of responders.
- Prevent observers and evaluators from interacting with responders.
- Be prepared to suspend exercise activities in the immediate area and to use pre-arranged protocols to terminate an exercise.

Evaluators.

An evaluator's function during the exercise is to observe and document exercise activities and conditions. The evaluation assessment is performed after the exercise is terminated.

Evaluators document and evaluate the performance of the responders and the adequacy of facilities, equipment, and resource documents (e.g., drawings, reference materials, maps) used by the responders. Evaluators are assigned specific locations or responder functions to evaluate. Responder performance *must* be evaluated against plans and procedures using criteria established prior to the exercise. Evaluators document the responders' performance and attend the critique facilitated by the controllers immediately following the exercise during which the responders discuss their performance. The evaluation, documentation, and critique discussion(s) provide important data, which substantiate the exercise findings.

The AAR summarizes the overall results of the exercise and provides a comprehensive assessment of the emergency response performance. Evaluators should do the following:

- Review appropriate emergency response plans, procedures, and documents prior to the exercise.
- Prior to the exercise, review appropriate EXPLAN materials including the objectives, scenario, messages, Safety, Media, and Security Plans, and evaluator instructions.
- Attend required training and briefing sessions.
- Observe the performance of the responders during the exercise and document their actions using evaluation modules or checklists.
- Observe the performance of the control organization in controlling and directing the exercise.
- Refrain from interfacing with responders to preclude interrupting or prompting their decisions or actions.
- Evaluate responder performance and the adequacy of procedures, facilities, and equipment based on specific evaluation criteria.
- Document errors and problem areas in the scenario or conduct of the exercise.
- Present their evaluations and recommendations in a formal critique.

Exercise information should be closely guarded and not discussed with potential responders. Scenario materials should be secured at all times, when not in use. All copies of the EXPLAN should be numbered and assigned while under review to ensure

accountability during the review/development period. To ensure that exercise confidentiality is maintained, controllers and evaluators should do the following:

- Be careful of what they say and to whom because it may be overheard.
- Take care in positioning themselves while observing an exercise activity to ensure they do not give away specific information by their actions.
- Ensure responders cannot read their scenario, timeline, notes, inject messages or other sensitive materials before or during an exercise.

Exercises are subject to evaluation by “external” DOE/NNSA organizations (i.e., an organizational entity beyond that of the immediate facility/site conducting the exercise), including any organization [e.g., Defense Nuclear Facility Safety Board (DNFSB)] with oversight responsibility. An external exercise evaluation may also include an evaluation of the manner in which the exercise is conducted, controlled, and evaluated. This evaluation would likely include an evaluation of the performance of the controller and evaluator organizations.

B.2.3 Controller and Evaluator Training and Briefings

A formal training program for controllers and evaluators enhances the capability of the emergency management program to maintain a level of consistency in how exercises are managed and response capabilities are evaluated. The training program should include initial and refresher training and a pre-exercise specific briefing to provide controllers and evaluators with the information and direction necessary to perform their duties with confidence. Both generic training and exercise-specific briefings are discussed in Chapter 3, DOE G 151.1-3.

B.3 Controller Activities

Controller responsibilities include pre-exercise setup, exercise conduct, and post-exercise activities. Selected controller responsibilities during the exercise process are given below:

Pre-Exercise Activities

Initial Training
Refresher Training
Security Access
Simulation Setup
Communications Check

Activities During the Exercise

Exercise specific Briefing
Responder Briefings
Earned Information
Contingency Messages

Unplanned Suspensions

Restart
Exercise Termination

Post-Exercise Activities

Participant Rosters
Self critique Sheets
Responders' Critiques
Evaluators' Critiques
AAR

The following section reviews methods of controlling an exercise, as well as specific responsibilities of controllers before, during, and after an exercise.

B.3.1 Pre-Exercise Activities

Controllers must review the exercise and scenario materials, attend exercise-specific training, perform communication checks, set up simulations, and conduct pre-exercise safety and security checks before an exercise.

Controller Package.

A cover page should remind the controllers of the confidentiality of the scenario materials.

The Controller and Evaluator (C/E) Handbook supplements the EXPLAN by presenting more detailed information about the exercise scenario and describing exercise controller's and evaluator's roles and responsibilities. Larger, more complex exercises may use the Control Staff Instructions (COSIN) and an Evaluation Plan (EVALPLAN) in place of, or to supplement, the C/E handbook.

Controllers should be issued their materials for review prior to the exercise-specific briefing. The controllers, being experienced personnel, may be tasked to help the scenario developers finalize scenario details. The controller package may consist of part or all of the contents of the EXPLAN. Because some EXPLANs are very large documents, controllers may need to reorganize the material so that the information critical to their specific assignment is readily accessible. Controllers should bring their packages to the exercise-specific **briefing** sessions and be prepared to discuss any concerns or questions they have about this information. The controller package should include, as a minimum, the following information:

- Schedule of control activities
- Control organization and assignments
- Procedures for reporting within the control organization
- Suspension and termination procedures
- Scenario material
 - Objectives
 - Scenario narrative
 - Timeline and Master Scenario Event List (MSEL)

- Position-specific messages or injects, including associated data
- Position-specific safety and security instructions

Exercise-Specific Briefing. The overall objective of the pre-exercise briefing is to prepare the controllers to safely and effectively control the exercise without compromising the scenario or prompting responder actions. Controllers who do not attend the briefing should not serve as controllers during the exercise.

Day-of-the-Exercise Preparations. On the day of the exercise, controllers report to the staging area with their notes, scenario messages, data sheets, controller log forms for recording activities, and any other materials assigned. Controllers should have reviewed their instructions (example in **Figure B-1**), and highlighted specific responsibilities and messages that they are responsible for delivering.

Simulation Setup. The controllers may be required to assist in setting up the simulations that will be used in their control areas. This may include the preparation of smoke generators, positioning of special equipment or vehicles, simulated spills, and injured role players. It may also include the pre-staging of simulations for use later in the exercise or for contingency purposes. All simulations should be checked before reporting “ready.” It should be remembered that realism is second only to safety.

GENERIC CONTROLLER INSTRUCTIONS (SAMPLE)

1. Review the exercise objectives and controller package for your area of responsibility.
2. Using the Master Scenario Events List (MSEL), highlight the specific messages for which you are responsible.
3. Be located in the appropriate emergency response facility at least 30 minutes prior to the start of the exercise. If you are not assigned to a specific facility, be in place to meet the responders at least 15 minutes prior to their activation.
4. Obtain or locate necessary communications equipment and test it to ensure satisfactory communication between controllers and the senior controller and/or the timeline coordinator.
5. Wear controller identification, such as the required badge, armband, or vest.
6. Synchronize your watch with the lead controller to ensure that the exercise timeline and the controller logs are consistent. Verify weather conditions if actual meteorology is to be used during the exercise.
7. As instructed, distribute an exercise participant package to specific responders. This may include exercise limitations, meteorology, instructions, and the exercise telephone directory.
8. Do not enter into personal conversations with any exercise responder.
9. Deliver the messages you have been assigned at the time indicated. *Caution:* If the information depends on some action to be taken by the responder, do not deliver the message until the responder has earned the information by successfully accomplishing the required action.
10. When you deliver a message, provide the senior controller with the message number and delivery time.
11. Begin and end all exercise communication over the radio or telephone with the phrase “**THIS IS AN EXERCISE.**” This precaution is taken so that anyone overhearing the conversation will not inadvertently mistake the exercise play for an actual emergency event.
12. If you are to deliver specific data, deliver it as directed on the message instructions. . (Examples: Do not deliver vital signs of an accident victim until the first responder attempts the appropriate actions for obtaining these; do not volunteer radiation readings until the technician has turned on and read the detection instrument.)
13. Record all activities and the time in your controller log. Do not write opinions; rather, write about specific actions.

Figure B-1. Sample Generic Controller Instructions

GENERIC CONTROLLER INSTRUCTIONS (SAMPLE) (cont'd)

14. If responders do not perform as expected and a contingency message is not provided, notify your lead controller immediately and ask for direction. No unplanned simulations should be allowed without the senior controller's approval. This differs from free play, which is action taken by a responder that is appropriate in solving the problem in a unique way.
15. Do not prompt a responder as to what a specific response should be unless a contingency message directs you to do so. Clarify information as long as it does not provide coaching.
16. Ensure that all observers stay out of the exercise activity. If you need assistance, notify your lead controller or security.
17. Do not provide information to the responders regarding scenario event progress or resolution of problems encountered by others. Responders are expected to obtain information through their own resources.
18. The senior controller will notify controllers when the exercise has been terminated. The exercise will be terminated when the Exercise Director, in conjunction with the senior controller, determines that all exercise objectives have been met, or enough time has elapsed for the objectives to be demonstrated.
19. Pick up copies of responder logs and pertinent documentation prior to the post-exercise debriefing and critique. This information should be given to the senior controller. Coordinate this task with the evaluator in your area.
20. At exercise termination, summarize your notes and prepare for the local area critique. Have the summary ready to turn over to your lead controller. The facility lead controller shall provide this documentation to the senior controller.

Page 2 of 2

Figure B-1. Sample Generic Controller Instructions (cont'd)

Pre-Start Safety Checks. Prior to the beginning of the exercise, pre-start safety checks are conducted. These include the checking of simulations, posting "EXERCISE IN PROGRESS" signs, weapons safety checks, and a final communication check with the lead controller.

The Exercise Director will not start the exercise until notified that all controllers have performed their communications check, verifying they are at their assigned location and their safety checks have been completed. The senior controller will give the control organization a time check (synchronizing watches). Large exercises may be started at a

predetermined time while smaller exercises may be started by voice command over the communications network.

B.3.2 Activities during the Exercise

The exercise control organization plays the crucial role in monitoring the sequence of events, injecting messages, and ensuring the overall safe conduct of the exercise.

Monitoring For Safety.

A controller's primary function is to ensure the safe execution of an exercise. The safety of everyone involved in the exercise, as well as the facility, public, and the environment, is the highest priority.

Controllers are responsible for knowing the limitations and precautions for exercise safety and security and for understanding and using this information to ensure that all participants comply accordingly. Precautions and limitations are provided to the controllers in the exercise Safety Plan and Security Plan and also in exercise-specific training. Such information may include details on physical security (such as facility access control), safety (such as the location of fire doors), information security (such as the location of classifiers to ensure classified information is not divulged), and other privileged instructions.

All participants in an exercise are responsible for acting in accordance with the exercise safety plan and are bound by DOE/NNSA requirements, as well as local laws and restrictions. It is the responsibility of the controller to stop any action that would violate any law or safety protocol. General safety rules applicable to all participants may include the following:

- Comply with all Federal, state, and local legal restrictions.
- Obey all traffic laws when responding to the exercise.
- Wear all personal protective equipment required for the job.
- Do not place yourself or anyone else in an unsafe position.
- Obey the directions of the controller at the scene.
- Preface and end all radio, telephone, FAX, and other communications with **“THIS IS AN EXERCISE.”**
- Ensure any weapons being used are empty and on SAFE.
- Contact a controller in the event of an actual emergency.

Methods of Control. Exercise control, in terms of the autonomy and authority of individual controllers, varies depending on the complexity of the simulated events, the

number of participating organizations, and the number and experience level of the controllers. Individual controllers may be delegated extensive, limited, or even no authority to issue message injects and contingency message injects without the Exercise Director or senior controller direction. The method of control for each exercise should be identified and documented, and the controllers should be trained on their individual levels of authority for message inject release and subsequent reporting.

Presenting Scenario Information. Controllers either initiate simulations or provide the description of the initial conditions to the responders. Controllers should introduce themselves and the evaluators in the area and identify the exercise safety rules. Simulations should be identified to the responders. For example, responders might be told that the real meteorological conditions will **NOT** be used and provided with the pre-determined (“canned”) wind speed and direction. Generally, it is the controllers' responsibility to set the stage for the event in their assigned area. The controllers depend on directions from the lead controller.

Scenario information (including physical evidence and visual cues) should be presented in a realistic manner to the responders as it would be found, measured, or otherwise indicated. After a valid field measurement is taken, the controller should inject the scenario value. For consistency and documentation, controllers should use data and instrument readings provided in their controller packages when giving technical information to responders. Visual cues such as victim moulage, liquids, solids, smoke, and other stage props should be used to make the event appear to the responders as if it were actually occurring. If emergency procedures require the use of protective equipment and clothing, the participants should use the actual protective equipment and clothing during the event.

Controllers should not intercede in exercise play unless it is warranted by safety considerations. Controllers should not prompt by providing information early, providing more information than the responder has earned, or phrasing sentences in a way that would cause the responders to perform an action.

Realism versus Simulation.

Making the exercise as real as safety will permit is one of a controller's prime considerations. The more realistic the exercise is, the less information needs to be provided to responders.

The purpose of an exercise is to demonstrate and evaluate response capabilities under simulated emergency conditions. Although it is impossible to predict or measure precisely what response would be under actual emergency conditions, a realistic exercise can provide a valuable picture and assessment of the response capabilities of each participating organization. The realistic presentation of information during exercises can create the sense of pressure and stress inherent in actual emergency situations.

Controllers should provide information to responders in a form and manner consistent with what would occur in an actual emergency, and present scenario information earned

by responders as a result of their actions. Responders should carry out every activity and response action exactly as they would in an actual emergency, such as using emergency equipment and checking instrument and meter readings. However, responders should only walk-down or discuss the response actions that would be necessary to restore or realign equipment using panel switches, to avoid changing critical process or plant equipment alignments and parameters.

Free Play.

It is the controllers' responsibility to monitor free play, note activities, and intercede when free play exceeds the limits established for the exercise or when safety is jeopardized.

Free play is a welcome part of an exercise because it allows responders to provide unique solutions to problems and to respond in ways not foreseen by the exercise planners. In order for free play to be successful, it must fall within prescribed parameters. If the responder actions compromise safety or exceed established limitations, the controller should note the intended action but prevent that action from actually occurring.

Tracking the Scenario and Responder Actions. One of the controllers' most important and difficult tasks is maintaining the timeline for scenario events and tracking responder actions. Controllers should record the time of all significant events associated with their part of the exercise, to include the following.

- Time of message delivery
- Contingency message delivery
- Responder key decisions and mitigation actions
- Free play
- Conversations with responders (or other controllers)

Controllers should note the affects of the messages on play and any unexpected activities, and report any discrepancy/deviation in scenario progress immediately to the lead controller. Later, controllers from different areas can meet to develop a consolidated timeline of exercise play and discuss how the exercise progressed overall.

Maintaining Exercise Pace and Focus. The senior controller, with the assistance of the timeline coordinator, should manage the exercise and ensure that the sequence of events identified in the exercise timeline occurs as close to schedule as possible. Individual controllers should follow the overall exercise timeline in order to keep their respective parts progressing in accordance with the scenario.

Use of the Master Scenario Event Line (MSEL).

The MSEL is one of the primary tools that controllers use to track the progress of the scenario. Evaluators will find that the MSEL is a useful tool for determining whether and when expected responses occur.

The MSEL lists all exercise messages and key events in a table that specifies the time the message delivery is expected, who delivers it to whom, a message number, and a short description of the message. Some MSELs also contain the responder-expected actions and associated exercise objectives to assist the controllers and evaluators in performing their functions.

Use of Scenario Messages. Controllers use prepared scenario messages (also known as controller injects, cue cards, and data input) included in their EXPLAN in conjunction with the MSEL. These messages include information on the placement of props, initial conditions, set-up of the area, and placement of observers. Messages that contain information on activities that are dependent on the completion of other activities should also include information on what to do if that initiating activity is not completed. If this information is not readily available, the controller should contact the senior controller. Exercise messages are developed to do the following:

- Create situations.
- Provide specific instructions and data.
- Correspond with activities required by emergency plans, procedures, checklists, etc.
- Notify participants of safety or compliance violations.
- Keep the scenario on track.

During the exercise, controllers inject messages through one of three methods: voice, hard copy, or face-to-face contact.

- **Voice.** Controllers inject oral messages to control progress of the exercise scenario. These messages include descriptive information that simulates an event or condition, or they may initiate a specific activity that will keep the scenario on track. These messages are given by the controller on location, or over the phone or radio by a controller at a different location such as a control cell. At specified times, controllers will contact the appropriate responder(s) and read the prepared condition or event text verbatim.
- **Hard copy.** Hard copy messages are designed to simulate electronic messages, memoranda, Material Safety Data Sheets, strip charts, news bulletins, etc. At designated times, controllers will deliver these messages to the appropriate responder. Messages of this type are provided on data cards or sheets of paper with appropriate time-related facility/site and hazards parameters, real-time data generated by a simulator or computer, or audiovisual presentations of data such as moulage, charts, or pictures. Parameters can be posted on appropriate control room panels, on cameras for viewing in several locations, or posted at, or generated by, computer terminals and printers. When hard copy messages are provided, the controller makes no additional comments.
- **Face-to-face contact.** Occasionally, selected controllers may play the role of a senior official, a decision maker, or an outside agency representative. While role-playing,

the controller interacts face-to-face with participants and provides information or responses to questions in a fashion appropriate for the role he/she is playing.

Messages help direct the progress of the exercise and clarify situations that cannot easily be described. Messages should normally include only information the participants could gain with their own senses (i.e., sight, hearing, smell, touch, and taste) in their location. Emergency situations like fires, tornados, injury of personnel, alarms sounding on control boards, suspected intruders, and radiation monitor alarms can be described in exercise messages.

Messages may appear in several different formats based on how they will be used during the exercise. Message formats may include data sheets, charts, pictures, and hard copies of voice messages. Information contained in the message should include recipient, time of delivery, expected responder action, and any additional information or directions for the controller. The controller should generally *not* give the entire hard copy of the message to the responder. Only the information portion of the message should be delivered to the responder. Occasionally, the controller may give a message directly to a responder, such as a note from simulated hostage takers.

Messages should not be used to describe situations that participants can and should recognize from facility data. A message such as “temperature is increasing” is usually inappropriate because it prompts responders with information that would not be provided in that form in a real emergency. The controller should understand and be aware of the action that a responder should take in response to a message. Thus, a message with an “actions expected” section may be provided to controllers (not passed to participants) so that they will be aware of what the responders should do.

Generally, controllers should provide the information to the responders as they progress through the scenario and “earn” information. To earn information, responders must act in a manner that would provide them the information in a real event. For example, if a message states that the oil bull's-eye on a pump is empty, the controller should provide that information when the participant looks at the bull's-eye. If participants follow appropriate steps for obtaining information, the controller may then provide it. Controllers should only provide earned information and nothing else that would instruct responders how to proceed.

For simulated events such as fires, controllers should provide the “scene setting” information as responders earn it. For example, in approaching a closed fire door, the controller should tell a team member “the door is hot” only after the team member has actually touched the door. Likewise, the team member would be told “the room is filled with smoke” only after the door has been opened. Information is provided in a sequence replicating the approach to an actual fire.

Contingency Messages. Controllers use contingency messages to force an action by a responder or response organization to keep the exercise on track. Controllers should issue contingency messages in accordance with the pre-established exercise protocol for

their use. If responder actions require a contingency message, the controller should contact the responsible lead controller before injecting the message.

Contingency messages provide supplemental symptoms or necessary information specifying existing conditions that will elicit the appropriate decision or response. Contingency messages should begin with an explicit directive such as the following.

- “Declare a General Emergency for the following reasons....”
- “Contact the state at this time to recommend the following action....”
- “To keep the exercise on track, order a site assembly at this time.”

In some cases, a contingency message may be issued solely to keep the exercise scenario coordinated. An example contingency message would be one preventing operations personnel from beginning a radiological release until a pre-established time so that time-dependent, hard copy radiological data remain credible for the facility/site status and conditions being simulated.

A negative exercise finding may result if exercise play does not occur as expected and responders must be provided a contingency message to induce activities that should have occurred without controller intervention.

Suspension or Termination of an Exercise.

The controller's role in suspending, restarting, or terminating an exercise is to ensure that responders clearly understand when these actions have been implemented. Controllers also provide specific instructions to responders covering any requirements or activities they must undertake. In the case of restart, responders may have to “redo” activities because they are critical for responder performance at other locations.

Suspension or termination of an exercise is managed through the control organization. Responders are instructed to contact a controller when an unsafe condition exists or when an actual emergency is identified. The EXPLAN identifies how the control organization will be notified and the procedures for exercise suspension, restart, and/or termination.

Figure B-2 is an example of suspension and termination instructions.

- **Suspension.** Provisions for suspension or premature termination of the exercise for safety reasons are provided in the controller package. If an unidentified or questionable situation arises that may affect the participants, a controller may suspend play and immediately notify the senior controller. Play may be restarted if the situation is resolved.

In the event of a real emergency, it is the controller's responsibility to suspend the exercise in the immediate area for which he/she is responsible and to contact the senior controller. An actual emergency always takes precedence over an exercise. If

necessary, the Exercise Director may terminate the exercise so that resources can be devoted to the real emergency.

- **Termination.** Information concerning the procedures and protocol for terminating an exercise are included in the controller package and reviewed at the pre-exercise briefing. Termination of the exercise at any time is under the authority of the Exercise Director. Upon notification from the Exercise Director or a lead controller, the controllers should immediately announce the termination of the exercise, record the time, and ensure that responder exercise activity ceases.

In general, an exercise will be terminated when one of the following conditions is met.

- Exercise objectives have been met and the pace of play indicates that major events have been drawn to a logical conclusion.
- Enough time has elapsed to allow the objectives to be demonstrated.
- An actual emergency occurs.

SAMPLE SUSPENSION AND TERMINATION INSTRUCTIONS

The exercise is scheduled to begin at 8:00 a.m. Mountain Standard Time (MST) or 10:00 a.m. Eastern Standard Time (EST). No responders should be pre-positioned, and response should be in accordance with established policies and procedures. The exercise is scheduled to run 6 hours with termination at 2:00 p.m. MST/4:00 p.m. EST. Each emergency response facility participating in the exercise should conduct a critique of their involvement immediately following the exercise. All controllers and evaluators are expected to take notes of items identified by the exercise responders. If controllers or evaluators are asked for their impressions of how things went, specific issues or problems should not be discussed.

The exercise may be terminated by the Exercise Director when exercise objectives have either been demonstrated or given an adequate opportunity to be demonstrated. Following consultation with the senior controller and lead exercise evaluator, the Exercise Director will make the announcement concerning exercise termination.

If an *actual emergency occurs*, the exercise may be suspended or terminated at the discretion of the Exercise Director. DOE/NNSA, Federal, State, Tribal, local, or DOE/NNSA contractor authorities, depending on the nature of the incident, may recommend termination to the Exercise Director.

If the exercise is suspended, the controllers will instruct the responders to safely stop in place. The conditions for restart of the exercise will be determined by the exercise director in consultation with the lead control personnel from the participating organizations. The controllers will be instructed on restart conditions.

Figure B-2. Sample Suspension and Termination Instructions

Sometimes, facility locations and offsite organizations have specific objectives (e.g., recovery and reentry) that are not applicable to other exercise locations. If that is the case, the senior controller should determine the extent of play necessary to permit those locations/agencies to meet their objectives. In such cases, termination of an exercise may be staggered for different groups of responders.

Premature termination of an exercise presents a problem among response organizations in that it may preclude them from meeting their objectives. To prevent premature termination, the Exercise Director should obtain concurrence from lead controllers that objectives have been demonstrated or sufficient opportunity has been provided for the objectives to be demonstrated prior to terminating the exercise.

B.3.3 Post-Exercise Activities

The two primary post-exercise duties for controllers are facilitation of responder “hotwash” critiques immediately following the exercise and participation in the exercise evaluation process. Since the controllers ensured the pace and focus of the exercise, they have unique understanding of who performed response actions when and why and, therefore, typically lead the hot wash critiques. Controllers typically provide input to the critique and evaluation process because of their in-depth familiarity with the exercise activities and responder actions.

B.4 Evaluator Activities

Preparation is the key to effective evaluation. Persons assigned as evaluators must be thoroughly prepared and cannot simply show up on the day of the exercise. Evaluations depend significantly on the way the facility/site responds to an emergency and should be based on the specific emergency management program and specific scenario.

B.4.1 Pre-Exercise Activities

Evaluators should be trained and thoroughly prepared for their assigned duties for each exercise. Understanding the scope, exercise objectives, and evaluation criteria, and being familiar with emergency plans and implementation procedures will help ensure that the evaluators can concentrate on observing the actions of the responders.

Evaluators have the following three primary responsibilities prior to the exercise:

- Obtain and review all emergency plans, procedures, and checklists for the activities to be evaluated.
- Understand the exercise objectives and know how they relate to the evaluation criteria.

- Attend the pre-exercise briefing for controllers/evaluators. Also attend, if presented, the exercise safety briefing for all participants that is separate from the other pre-exercise briefings.

Additional information about the site or facility being evaluated should be provided to those evaluators who work at another facility or site. This information should include the ERO structure, procedures, notifications, communication systems, Incident Command System, facility walk-downs, and maps.

Emergency Plans and Implementation Procedures

Evaluators should understand the Emergency Plans and implementation procedures being used by the responders they are evaluating. The evaluation includes an assessment of responder implementation of the plans and procedures, as well as an assessment of the adequacy of these plans and procedures.

Emergency Plans and Procedures are frequently updated. Failure to review plans and procedures may result in evaluator errors and skewed evaluation results. The person assigned as lead evaluator should ensure that evaluators receive plans and procedures far enough in advance to allow for a thorough review and evaluators assigned to the exercise know the importance of the plan and procedure review.

Exercise Objectives, Criteria, and Checklist Relationship

Evaluators must understand the relationships between the exercise scope, objectives, evaluation criteria and the evaluator checklists prior to the exercise. This relationship provides the evaluator with insight on what has to be done, which items are critical, and how-observations should be classified.

Exercises test response capabilities according to a set of measurable exercise objectives. Each objective is associated with a standard of performance or criterion, which must be met to demonstrate that objective. Checklists are derived from these criteria to assist evaluators in measuring performance. The relationships between these elements and how they fit together in the evaluation process are described in the following paragraphs.

Generic exercise evaluation criteria are provided for each Program Element in Chapter 4 Appendix D of DOE G 151.1-3, and should be used to develop facility- and exercise-specific evaluation criteria as part of the exercise development process. Evaluators use exercise-specific criteria to determine whether exercise objectives have been adequately demonstrated. **Figure B-3** exemplifies how evaluation objectives, criteria, and checklist items are tied together in evaluation materials.

Though checklists vary from site to site, they should contain the following items:

- Method for recording a chronology or timeline of observed events
- Standards related to a specific exercise objective

- References for that standard
- Criteria associated with the standard
- Activity-specific criteria (list of activities to look for)
- Method for documentation and comment on these specific activities

Evaluation checklists for documenting specific activities may vary from yes-or-no answers for activity-specific criteria to numerical evaluations and/or evaluator comments. Standardized forms may simplify the process of documenting observations and analyzing the combined results. A simple form with brief instructions and space to list identified concerns works well, as does a checklist that uses a rating system for the objectives. Evaluation forms should be as straightforward as possible and should have space to identify the evaluator, location, activity observed, responders observed, and the time and date.

Objective: *Activate the EOC, achieve operational status, and staff the EOC in accordance with xxxxx procedures.*

Criteria:

- P/E8.1 A facility is available for use as a command center by the Emergency Director (ED) and the members of the ERO during an emergency response.
P/E6.7 The ERO activation is based on actual or potential emergency conditions.
P/E6.8 Initial response functions are performed by on shift operations staff.
P/E6.9 The ERO is functionally staffed and activated in a timely manner; key emergency response facilities are operational within an hour after declaration of an Operational Emergency.

References: Site Emergency Plan, Site EOC Implementing Procedure

CHECKLIST

Criterion P/E8.1 -

___ A facility is available for use as an EOC.

Criterion P/E6.7 -

___ ERO activation is based on criteria specified in the Emergency Plan

Criterion P/E6.8 -

___ On shift operations staff has completed initial response functions according to the Emergency Plan.

Criterion P/E6.9 -

1. The following positions were staffed within 1 hour:

- ___ Emergency Director
___ Federal Communicator
___ Plume Modeler
___ . . . per procedure

2. The Emergency Director:

- ___ Completed a turnover from the shift supervisor and assumed overall direction and control within 15 minutes of arrival at the EOC
___ . . . per procedure

OBJECTIVE STATUS

MET _____ **NOT MET** _____ **NOT OBSERVED** _____

JUSTIFICATION:

Figure B-3. Sample Evaluation Form

Evaluator Package. Evaluators are issued materials for review prior to the exercise evaluator briefing. The evaluator package is a subset of the items provided in the EXPLAN, as well as specific evaluator instructions and other items. Because the EXPLAN can be very large, evaluators should reorganize the information or remove sections from the EXPLAN for field use so that the information critical to their assignment is readily accessible. They should bring the package to the exercise-specific briefing and be prepared to discuss any questions related to the packages. The evaluator package should include the following information:

- Cover letter discussing scenario confidentiality and providing a point-of-contact
- Chart or listing of the evaluation organization
- Plans, procedures, and checklists used by the organization or people evaluated
- Detailed instructions for the evaluator, including a schedule of events
- Exercise scope
- Exercise objectives and evaluation criteria
- Evaluation checklist(s) and materials
- Scenario material
- Site map(s)

Instructions. Evaluators are provided with general and specific instructions for supporting pre-exercise setup, exercise conduct, and exercise evaluation (see **Figure B-4**). Information provided in evaluator instructions may include the following:

- Location and layout of the facility or function to be evaluated
- Expected time of responder arrival
- Logistical information
- Communication contacts and equipment
- Applicable plans and implementation procedures
- Potential problem areas
- Approved simulations

Each evaluator should review and become familiar with the specific information provided in the package.

<p style="text-align: center;">SAMPLE EVALUATOR INSTRUCTIONS EOC EVALUATOR _____ <Name></p> <ol style="list-style-type: none">1. Participate in the evaluator pre-exercise briefing on May 10, 2xxx, at 11:00 a.m. in the (location).2. Report to the visitor center not later than 6:30 a.m. on the morning of the exercise for transportation to the EOC. Bring your evaluator package with you.3. You will receive your lunch and “evaluator” identification at the EOC.4. Check in with the lead evaluator by telephone (X-1234) when you arrive at the EOC.5. Coordinate with the EOC controller for conduct of the responder critique after the exercise.6. Report to the <location> at 5:00 p.m. for the evaluator debriefing. Bring your evaluation sheets, checklists, and notes from the critiques. Dinner will be provided. The meeting will not go past 10:00 p.m.7. Attend the DOE management debriefing at 8:00 a.m. the morning after the exercise. The debriefing will be conducted at the Federal Building, Room 123.
--

Figure B-4. Sample Evaluator Instructions

Exercise-Specific Training. Exercise-specific training is conducted prior to the exercise and assists in preparation of the evaluators to perform their functions. It may be combined with the controller training and includes a detailed briefing on exercise activities and the scenario. This training provides the opportunity for evaluators to ask questions and to ensure they completely understand their roles and responsibilities. Evaluator questions should be addressed and information clarified so that evaluators feel confident they can effectively perform their assignments.

B.4.2 Activities during the Exercise

During the exercise, an evaluator's primary responsibility is to document observations of responder activities. This includes maintaining a chronology of events and using the checklists to ensure that accomplishment of key actions has been recorded.

Evaluators should report to their appropriate staging areas with any notes, evaluation criteria forms, evaluator identification, safety equipment (hard hats, safety glasses), and other evaluation materials. In addition, evaluators need to ensure communication arrangements are adequate and verify that any equipment they will be using is in working order.

During the exercise, evaluators should address any questions or needs for clarification of information to the controllers. They should not interact with responders to preclude prompting responders or interfering with responder performance.

Realism versus Simulation. The purpose of an exercise is to demonstrate and evaluate response capabilities under simulated conditions. Even though responders know that the events are simulated and that an actual emergency is not occurring, realistic presentation of information can create an atmosphere that parallels that of a real emergency. The exercise should be planned so that events and required responses are as realistic as possible, thereby mimicking the sense of stress inherent in any actual emergency situation.

Whenever possible, every activity and response action should be carried out exactly as it would be if the events were real. Controllers should provide information to responders in a form and manner consistent with what would occur during an emergency and as a result of specific events or actions taken by the responders. Responders must earn information (e.g., attempt to check instruments, perform meter readings, or take vital signs) **before** they are given the information. However, responder(s) should “walk or talk through”, rather than actually perform response actions to restore or realign equipment using panel switches to avoid changing critical process or facility equipment alignments and parameters. Evaluators should evaluate methods used by controllers in acting on or the disseminating scenario information.

Free Play. During an exercise, responders may interject mitigating actions that are not included in, but can be accommodated by, the scenario. In some cases, the scenario timeline will be modified to accommodate this free play. The controller team is responsible for controlling free play

Evaluators should note any free play activities in the exercise and the actions taken by the responders. Free play may indicate a better understanding of emergency management and response activities by the responders than the exercise planners. Evaluators need to be aware of what is going on between controllers and responders during free play so they can document the actions.

Actual equipment and procedural problems during the conduct of an exercise interject a form of free play. Responders' solutions to actual equipment or procedural problems on a real-time basis during the exercise afford a valuable opportunity to evaluate the conduct and training of the responders. Controllers should allow responders to solve such problems unless safety is compromised or exercise limitations are exceeded.

During the exercise, the primary duty of evaluators is to document responder performance. After the exercise, that data will be used to determine whether the exercise objectives were demonstrated.

Scenario Confidentiality. Scenario information should be closely guarded to ensure its confidentiality. If responders are aware of the scenario beforehand, it will skew any assessment of the emergency response capabilities. The following are some guidelines for evaluators:

- Evaluators should be careful of what they say and to whom because it may be overheard.

- Evaluators should be careful when positioning themselves to observe an activity to ensure they do not give away information by their actions.
- Evaluators should ensure that no one sees their scenario material or comments. They should never lay their scenarios, notes, or messages in a location where responders can read them.

Documenting the Exercise.

Evaluators observe and document responder activities during the exercise. It is essential that evaluators keep accurate records and notes because these will form the basis for evaluation of performance.

The value of exercise evaluation is the ability to provide constructive feedback (positive or negative) to improve and enhance the effectiveness of an organization's response to emergencies. Accurate and detailed documentation is critical in facilitating a full record of all the events in an exercise and an understanding of responder actions.

Evaluators document the exercise by maintaining a chronology of important events, decisions, and actions in their area. Evaluators should document key activities for later evaluation, especially those that require a timely response. A list of these important events is included as part of the EXPLAN - in the timeline or MSEL. Highlighting or noting events that occur in an evaluator's assigned location(s) is an effective way to track responder activity.

Evaluators should review their chronologies and notes immediately following termination to ensure an accurate reconstruction of events and activities for discussion at critique and evaluation sessions. Evaluation materials, as well as critique notes and forms, become part of the exercise documentation. Checklists and evaluation forms should be completed as thoroughly and accurately as possible.

Evaluation Basics. Experienced evaluators use the following techniques for effective observation and evaluation:

- Use checklists to confirm that exercise objectives are met.
- Take detailed notes concerning significant activities observed, including the time of occurrence.
- When more than one evaluator is assigned a facility/area, divide responsibilities to ensure detailed observation of responder activities.
- Stay in close proximity to responder decision makers.
- Focus on critical activities (e.g., dose assessment decisions, protective action decisions, command and control issues).

Although numerous events may occur simultaneously, evaluators do not need to record all of the action. Knowing which events are important eliminates superfluous information and provides the kind of data most useful for exercise evaluation. Important events to record include the following:

- Initiating scenario events (including when responders first detect abnormal conditions)
- Emergency facility activation and staffing completion
- Reactions of responders to the scenario
- Key decisions made by managers and the time they were made
- Deviations from plans and implementation procedures
- Times when mitigating actions were completed

Locations for Monitoring. Evaluators should be located so that they can observe responder actions and hear conversations without interfering with those activities. Certain conditions may warrant more than one evaluator being located in a setting or area.

What information is critical to collect? Individuals who prepare the AAR will analyze the results provided by all evaluators to achieve an integrated evaluation of response capabilities. Their analysis will focus on the measures taken to mitigate the simulated emergency, the timing of key events, decisions made, and actions taken. Potential problem areas include the following:

- Lack of timeliness in mitigating actions
- Ineffective communication among responders and organizations
- Inadequate direction and coordination of field activities
- Inability to monitor and assess scenario events
- Ineffective command and control at the scene or response facility
- Control problems that hinder conduct of the exercise
- Responder deviations from plans and implementation procedures
- Unclear plans or procedures that hinder responder efforts
- Facility or equipment shortcomings that hinder responder efforts

Evaluator Do's and Don'ts. Evaluators should know that scenario data and conditions must not be changed without obtaining the permission of the Exercise Director or other designated persons. Evaluators should not interfere with a responder's action, unless there is safety issue. Responders should be free to make their own decisions and should

act on those decisions without interference. Listed below are reminder *do's* and *don'ts* for evaluators.

Do's:

- Be familiar with other controllers and evaluators.
- Remember that there may be two time frames, a scenario time and a real time. Scenario time may compress events so that several days are played in a few hours.
- Note any communications passed between time zones.
- Identify the participants by title and function.
- Be easily identifiable. Wear the prescribed identifier (e.g., arm band, shirt, or name tag).
- Position yourself to maximize your effectiveness.
- Locate the telephone or radio (for field teams) you will use and know how to use it.
- Be sure you understand the scenario. Know precisely what level of simulation is required and acceptable.
- Work with the other evaluators. Make sure they are reasonably aware of your actions and those of the responders.
- Make notes on responder's strengths and weaknesses related to the activities, as well as areas for improvement. Use critique sheets.
- Attend responder hot wash critique to document observations.
- Attend the post exercise critique session to provide your comments (if appropriate) and recommendations to the Exercise Director.
- Complete evaluation forms as soon as possible following termination of the exercise, while details are still clear in your mind. Identify your observations.
- Collect copies of exercise-generated documents such as notifications forms, media releases, employee announcements, consequence assessments, etc.

Don'ts:

- Don't leave your post at key times.
- Don't ever prompt a responder!
- Don't get in the way.

- Don't answer questions from responders; refer them to the controller.

Termination of the Exercise. Upon notification from the Exercise Director or the senior controller, controllers will announce the termination of the exercise. Evaluators should note the time and circumstances associated with the termination.

B.4.3 Post-Exercise Activities

The primary post-exercise duties for evaluators are documentation of responder hotwash critiques immediately following the exercise, participation in the exercise organization critiques, and the exercise evaluation and report-writing processes. Evaluators will work with other members of the exercise organization during the evaluation process to “complete the picture” of responder actions and assess whether objectives were met, and what improvements or corrective actions are needed. These evaluation activities are covered in Section B.5, below. Specific instructions, guidelines, and schedules for evaluators will be in their evaluator packages.

B.5 Exercise Critique and Evaluation Process

Controllers and evaluators participate differently in the exercise evaluation process. While the majority of controller activity occurs during the exercise, evaluators perform the majority of their functions after the exercise is completed. Both groups make significant contributions to the evaluation process.

B.5.1 Evaluation Input

In addition to evaluator observations and documentation, the following sources of information may be used to evaluate the exercise.

- Self-critique forms
- Exercise critique comments
- Exercise evaluation materials completed by controllers
- Observations contained in the post-exercise reports submitted by participating agencies

B.5.2 Critique of the Exercise

A series of formal critiques is conducted after the exercise to provide participants (responders, controllers, and evaluators) the opportunity to identify and discuss observations (both positive and negative).

Responder “Hotwash”/Critique. This critique occurs immediately after the exercise and is facilitated by the controller team at each location. The purpose of the critique is to provide a forum for constructive feedback on the exercise by the responders. The identification of both positive and negative observations provides a starting point for

improving emergency response capabilities. This is a unique opportunity for responders to discuss the event and to provide their own perspectives on the activities. Controllers may partake in the discussion of the observations. Evaluators usually remain silent and document the observations and feedback from the responders.

The critique should be performed while exercise activities are still fresh in the minds of the responders, controllers, and evaluators. Responders may identify any weaknesses, shortfalls, or improvement items. They evaluate their plans, procedures, and task checklists for specific response organization positions, equipment and supplies, facility layout, and performance. For smaller exercises, the facility director (exercise responder) often conducts the critique, but it may also be under the direction of the facility lead controller. Controllers should answer questions on the timeline and scenario. This session can also be used to clarify and verify any information on which there were questions. Responders usually have a basic understanding and evaluation of their job performance during the exercise.

Controllers and evaluators should not provide the responders with details of any observations during this critique. Controller input should be limited to feedback concerning the actual event scenario, as opposed to the outcome of exercise.

Responders should be reminded that all controller/evaluator observations are preliminary and may be revised based on information from other evaluators.

If an evaluator or controller did not observe specific aspects of an organization's performance, the exercise responders may be asked to comment. Since it is critical that the evaluators not prompt or coach responders during the exercise, the evaluator should raise all questions of this nature through the controller after the exercise activities have been completed. These aspects should be indicated in the evaluation as being provided by responders.

A responder self-critique form can be used for documenting responder information about the exercise. Normally, the controller distributes these forms immediately before the critique begins. They should be collected after the critiques along with all attendance or participation rosters. Controllers should emphasize to responders that the self-critique forms provide the opportunity to candidly comment on emergency response activities and effectiveness of the exercise.

Evaluation Critique. This critique session generally occurs the day following the exercise and includes participation by all controllers and evaluators. This critique should provide the forum for discussion and correlation of individual observations, the formulation of exercise findings, determination of objectives demonstrated, and determination of overall exercise performance. Preliminary discussion on recommendations for corrective and improvement actions should be initiated.

Formal critique sessions are usually several hours in length and address, at a minimum, the following elements.

- Reconstruction and review of scenario events and shortcomings in the scenario or exercise conduct.
- A comparison of anticipated versus actual responder activities.
- An assessment of performance based objectives and criteria.
- An assessment of the adequacy of plans and procedures.
- An assessment of the adequacy of facilities, equipment, and communications.

The first part of the critique is devoted to reconstruction of scenario events and response activities. Timelines should be reproduced for major evaluations, such as the troubleshooting and restoration of a needed piece of vital equipment. At this time, evaluators will organize and consolidate their documented observations. The controllers will provide input to the evaluators' documentation.

After this initial documentation is complete, the lead evaluator for the exercise will facilitate a review of the events (using the timeline) to document the interactions between response organizations. This is generally time-consuming, but it provides the information required to check the communication process among all response organizations, resulting in a consolidated exercise timeline of events that actually occurred.

After this process is completed, the individual evaluators should have sufficient information available for determining whether the responders demonstrated the exercise objectives. Although the evaluation is primarily concerned with the exercise objectives, collateral observations of responder activities that should be mentioned (positive and negative) are documented.

Each evaluator should develop a rationale for the evaluation from their respective point of view. This assists the evaluation report writer in assessing conflicting information that may occur from different sources. When the exercise demonstration is substantially at variance with what was expected, the evaluator should describe this in enough detail to provide a sense of what occurred.

The critique should end with a discussion of the preliminary results of responder performance for each exercise objective. Evaluator notes and materials should be collected at the conclusion of this session.

Senior Management Briefing/Critique. Key participants should attend a senior management critique, including: management-level responders, the exercise director, the lead controller(s) and the lead evaluator(s). The overall exercise performance, significant observations, findings, and preliminary corrective and improvement actions should be addressed.

B.6 Exercise Report

The AAR is prepared by the evaluation team to document evaluation of overall exercise performance. This report is the responsibility of the lead evaluator. Information from the formal evaluation and critique process provides the supporting documentation necessary to generate the exercise report. Additional exercise reports may also be prepared by any external Departmental organizations that evaluated the exercise.

The AAR covers the schedule, scenario, participants' activities, observations, and recommendations for corrective actions. The AAR considers the observations and evaluations made by the evaluators, controllers, responders (self-critiques), and other participating organizations. The AAR may contain the following.

- Executive Summary
- A narrative summary with introductory and general statements noting exercise scope, purpose, objectives, participants, and an overall performance (rating may or may not be assigned) of the exercise.
- Detailed findings for each objective, including positive and negative comments regarding the effectiveness of emergency planning and preparedness elements.
- Recommendations for correcting negative findings.

Once the AAR has been drafted, the evaluators should review the report for accuracy. Evaluator findings will in turn be reviewed to ensure responders were measured against the evaluated organization's plans and procedures. Because perceptions differ, the report writers may find it necessary to adjust or "level" various findings to achieve standardization and consistency within the AAR. The lead evaluator should approve the leveling of any findings.

4. READINESS ASSURANCE

4.1 Introduction

The purpose of this chapter is to assist DOE and NNSA field elements in complying with the DOE O 151.1C requirement that a Readiness Assurance program be in place to assure that emergency plans, implementing procedures, and resources are adequate and sufficiently maintained, exercised, and evaluated and that improvements are made in response to identified needs.

Readiness assurance programs provide assurances that the key activities of emergency management (planning, preparedness and response) are effective in maintaining an adequate and reliable response. Readiness assurance performs an essential role in the development, management, and improvement of emergency management programs. Its structured process of evaluations followed by a rigorous implementation and tracking of program improvement ensures an efficient and timely progression toward a high quality emergency management program. For this reason, this chapter of the Emergency Management Guide (EMG) will stress the importance of and provide guidance for the implementation of a formal, structured, and reliable readiness assurance program for each DOE/NNSA facility/site and activity.

The readiness assurance requirements in DOE O 151.1C and the guidance contained in this chapter are consistent with DOE P 226.1, *Department of Energy Oversight Policy*, and DOE O 226.1, *Implementation of Department of Energy Oversight*. DOE P 226.1 establishes that all levels of the Department must have an assurance system to pursue excellence through continuous improvement. DOE O 151.1C requires all levels of the Comprehensive Emergency Management System, facility/site or activity (contractor), Cognizant Field Element, and Cognizant Secretarial Officer to conduct annual self-assessment of their programs. This chapter of the guidance concentrates on acceptable methods of implementing those requirements at the facility/site or activity level, with Section 4.6 specifically addressing self-assessments.

In addition, DOE O 151.1C follows the DOE Oversight Model (DOE P 226.1) with readiness assurance requirements for the Cognizant Field Element and Cognizant Secretarial Officer to ensure the continuous improvement of the Comprehensive Emergency Management System at all levels of the Department. Teams from the Cognizant Field Element and/or Cognizant Secretarial Office levels most often employ the structured approach to emergency management evaluations discussed in Section 4.4. The DOE Office of Health, Safety, and Security, Office of Emergency Management Oversight (HS-63) conducts independent oversight of emergency management programs.

A potential readiness assurance effort is the use of an accreditation program at the site level. Under the auspices of the Emergency Management Issues Special Interest Group (EMI SIG), an Emergency Management Accreditation (EMA) Program is under development. Accreditation provides an evaluation of the site emergency management program by independent third-party evaluators. The accreditation process focuses

attention on areas that need improvement as well as recognition of excellence. The EMA Program goes beyond the minimum DOE O 151.1C requirements for each program to conduct an annual self-assessment of the emergency management program. The accreditation program is optional -- sites may or may not elect to pursue accreditation. After successful conduct and validation of a pilot accreditation assessment, corresponding guidance will be developed.

Section 4.2 presents a discussion of the general approach to readiness assurance evaluations and continuous improvement. Section 4.3 contains an approach for implementing a formal readiness assurance program of evaluations, improvement, and documentation. The discussion in Section 4.4 introduces performance-based evaluations and their application to the emergency management program elements, using a standard set of evaluation criteria. The process of evaluating programs is detailed in Section 4.5, self-assessments and post-accident evaluations are addressed in Sections 4.6 and 4.7, respectively, and a basis and approach for developing performance indicators for emergency management programs is presented in Section 4.8. Format and content guidance for Emergency Response Assurance Plans (ERAPs), criteria for performance-based evaluations, and a systematic approach for performing self-assessments are contained in Appendices C, D, and E, respectively.

This guidance is designed primarily for facilities/sites and activities required to implement an Operational Emergency Hazardous Material Program and is directed at operations and emergency management staff at Field Elements and operating contractor organizations responsible for DOE and NNSA facilities/sites and activities. The guidance focuses specifically on the personnel responsible for implementing readiness assurance programs and DOE/NNSA personnel responsible for performing evaluations and monitoring corrective actions while overseeing emergency management programs.

4.2 General Approach

DOE O 151.1C defines the framework of a readiness assurance program consisting of evaluations, improvement, and documentation. The Order specifies the responsibilities of the facility/site or activity in performing internal evaluations (*self-assessments*) to monitor their own programs, in addition to their responsibilities to respond to the external oversight evaluation activities of DOE/NNSA Headquarters and Field elements. The facility/site or activity must ensure that appropriate and timely improvements are made in response to needs identified through these evaluations, and through other activities such as training and drills. A formal tracking system monitors the implementation, verification, and validation of improvements made through corrective actions developed for findings from all sources. A formal program must be implemented that takes advantage of lessons learned from DOE/NNSA programs, as well as other similar government and private activities. Finally, facilities/sites and activities are required to develop or contribute to an ERAP that documents the readiness of the emergency management program based on emergency planning and preparedness activities and the results of the readiness assurance program, including evaluations and improvements. Thus, the key elements of a readiness assurance program to be discussed in this guide are

the evaluation program, the improvement program, and documentation of readiness assurance results and forecast of activities in the ERAP.

Managing a readiness assurance program requires that the emergency management organization take a systematic and structured approach to carrying out and/or integrating the results of program evaluations, program improvement, and the program planning reflected in the ERAP. Readiness assurance evaluation programs must be managed intentionally to test and evaluate all emergency management functions and activities. In addition, the evaluation program should be based on identified needs each year, focusing on areas where the organization has shown that it needs improved performance. The improvement program must ensure that corrective actions are rigorously developed and implemented, verified and validated, to correct identified problems, pursue lessons learned, and acquire relevant experience from other sites and industries. Annually, the organization should assess its overall readiness and identify resources needed to address improvements, as necessary.

As will become evident in subsequent discussions, no single evaluation tool provides the complete readiness evaluation required for *readiness assurance*. Also, the evaluation tools by themselves are not sufficient without an effective improvement process. Finally, management commitment and support is essential for committing resources necessary to meet requirements, conduct evaluations, correct deficiencies and weaknesses, and institute an effective lessons learned program. The elements of the *readiness assurance* program give the emergency management organization a framework to determine what is needed to ensure a viable emergency management, supported by convincing evidence. Hence, the readiness assurance program should be a comprehensive system, a “collage” of redundant and complementary evaluations, which provide both general and focused program validation, combined with a reliable, continuous improvement process.

4.3 Readiness Assurance Program

The DOE/NNSA emergency management Order requires that each facility/site or activity implement a readiness assurance program consisting of the following three components: evaluations, improvements, and documentation. The discussion in this section will address this framework as follows:

- Evaluation Program: Provides guidance on what to evaluate and methods of evaluation.
- Improvement Program: Provides guidance on the concepts of corrective actions, and lessons-learned, and the importance of management support.
- Documentation: Provides guidance on development and submittal of ERAP.

In the sections that follow, each component of the readiness assurance program will be addressed, providing guidance for developing and maintaining a rigorous continuous improvement process.

4.3.1 Evaluation Program

The first component of readiness assurance is the evaluation program. The purpose of evaluations is to identify problems in the emergency management program, usually focused on the DOE/NNSA emergency management Program Elements and their associated activities and functions. If problems are found, then improvements can be accomplished. This process is repeated periodically, so that continuous improvement becomes a constant component of the emergency management program. When no significant problems are identified (i.e., no Deficiencies or Weaknesses), then the results provide periodic *assurances* that emergency capabilities are sufficient to implement emergency plans in response to Operational Emergencies (OEs).

Evaluations of an emergency management program are focused on three general areas:

- Technical planning basis, plans, procedures and supporting analyses
- Preparedness activities
- Response performance

The first area focuses on the technical planning basis for the emergency management program and emergency plans, procedures, and supporting analyses developed to implement the program. The second area includes the planning and preparedness activities, which support and maintain the program. Finally, the response performance involves the implementation of the emergency plan and procedures in applying the response capabilities to mitigate consequences and protect people and the environment. Evaluations in the first two areas involve an assessment of *projected* response, based on observations resulting from document and analyses reviews, training data analysis and validation tests, the exercise program, corrective action tracking, etc. The response performance involves direct observations of *actual* integrated response to a simulated emergency situation.

Evaluations of projected response based on plans, procedures, supporting analyses, and preparedness activities can be comprehensive, since the documented response planning and the preparedness activities are intended to apply to the full planning basis of the program. However, evaluators are limited in their ability to assess, and hence, predict actual responder performance since they observe no demonstration of trained responders. They must simply rely on their assessment of the training responders have received and the plans/procedures they are to follow. In contrast, given the necessary resources, evaluations of demonstrated response are unlimited in reviewing and assessing all aspects of the responder performance. However, they are not comprehensive since the response evaluated is focused only on one scenario from the technical planning basis. The value of these two evaluation techniques (i.e., *projected* and *actual* response) lies in their complimentary aspects, one compensating for the weaknesses in the other. Both techniques should be conducted as part of an effective readiness assurance program.

Tools or processes for performing formal evaluations can differ for each of the program components discussed above, as follows:

- Plans, procedures, supporting analyses, and preparedness activities are evaluated using the following evaluation tools:
 - Program Evaluations
 - Performance Indicators
- Response performance is evaluated using:
 - Limited Scope Performance Tests (LSPTs)
 - Exercise Evaluations
 - Performance Indicators

Program Evaluations. Program evaluations involve a comprehensive examination and assessment of the *readiness* of an emergency management program, based on data collected from the following sources: documents, response tools, interviews, preparedness observations and data/records analyses. None of these sources or associated collection methods provides the evaluator with a complete picture of the emergency management program, as indicated below:

- Document reviews – *Expected/projected performance only.*
- Operation/utilization of response tools – *Demonstrates that tools are in place, but not their correct use in a response.*
- Interviews with responders – *Less stressful environment than a response.*
- Observations of training and drills – *Lack of realism; less stressful environment.*
- Analysis of preparedness data (e.g., training and participation records) – *Verification of training and participation not a validation of training effectiveness.*

Performance Indicators. Performance indicators also represent an evaluation tool for monitoring, tracking, and analyzing specific parameters that reflect the characteristics of a program's preparedness activities. They can provide a timely indication of problems developing in program *readiness*, if key parameters have been identified that might predict performance degradation. Performance indicators, which reflect response performance obtained directly from observations during exercises, can also be used to track and identify unacceptable trends associated with responder activities. Section 4.7 addresses performance indicators in more detail.

Limited Scope Performance Test (LSPTs). The LSPT is a technique used by evaluators to observe and evaluate performance in a single emergency response function or task. The test is conducted in isolation, separate from any other response functions or

activities, usually in a classroom-like setting. LSPTs involve an evaluation of the performance of a small group of responders or may focus on individual responders. Generally, scenario information is presented to the responder(s) who in turn are asked to demonstrate knowledge of procedures, familiarity with interfaces, required communications, resources, and decision-making capabilities. Example applications of the LSPT may include:

- Assessing the capability of site personnel who are responsible for emergency categorization and classification to make decisions and communicate those decisions as required by site procedures and Emergency Action Levels (EALs).
- Testing select managers on ability to develop and implement a reentry plan in response to a security initiated chemical release on site.
- Testing personnel on ability to select the correct EAL given a set of emergency conditions.

This technique provides an effective means for validating the training that a specific responder has received or, more generally perhaps, the training program for the specific response capability.

Exercise Evaluations. Exercise evaluations involve the evaluated observations of an *integrated response* to a simulated emergency situation, where multiple organizations or activities must function together to mitigate the emergency. Exercise objectives ensure that the opportunity for evaluation exists by focusing on specific activities or functions. Specific objectives provide the basis for evaluating/validating the performance of response capabilities. Exercise objectives clearly state what is to be demonstrated; they are specific, attainable, and measurable. Hence, the response capabilities to be evaluated are limited in that only one specific scenario is simulated.

There are several variations of the exercise that differ in scope and focus. For a more detailed discussion of these variations see DOE G 151.1-3, Chapter 3. A brief discussion of the application of these exercises is included below:

- **Tabletop Exercise** - Tabletops can be applied to any working group(s) or team(s) whose successful performance depends on the timely and appropriate interaction of all of the participating individuals or teams involved an emergency response. The scope is usually limited to the participants present and the focus is on the decision-making activities of those interacting. Control cells are used to simulate non-participants.

The EMI SIG has developed “A Guide for Conducting Emergency Response Tabletop Activities,” March 1998, and is available at <http://www.orise.orau.gov/emi>. Additionally, the Office of Independent Oversight and Performance Assurance (HS-63) issued an “Emergency Management Tabletop Performance Test Inspectors Guide,” available through the website at www.ssa.doe.gov/Sp40/sp43/docs.html.

- **Facility & Site Exercises** - A formal exercise program is established at a DOE/NNSA site to validate all elements of the emergency management program over a five-year period. Each exercise should have specific objectives and be fully documented. Each individual facility exercises its *facility-level* emergency response capability annually, including at least a facility-level evaluation and critique. Each facility has an external Departmental evaluation at least every three years. *Site-level* Emergency Response Organization (ERO) elements and resources participate in at least one exercise annually. This annual site-level exercise is designed to test and demonstrate the site's integrated emergency response capability. For multiple-facility sites, the basis for the annual site-level exercise must be rotated among facilities. At least once every three years offsite response organizations are invited to participate in a site-level *full-participation* exercise.

The evaluations of these exercises represent essential contributions to the *readiness* estimate for the emergency management program. As a readiness assurance technique, the evaluation of a well-controlled and designed exercise (especially a full-participation exercise) most nearly estimates the *readiness* of the program to accomplish the goals of emergency response ... to mitigate consequences and protect people and the environment.

- **No-Notice Exercises (NNXs)**. The basic objective of a NNX is to test/assess the ability of initial responders of the ERO to respond to a simulated OE under no-notice conditions similar to those encountered during an actual emergency. The duration of the NNX is normally limited to about 2-3 hours. The absence of scenario-specific consequence data for use in the exercise is a major factor limiting the duration of responder activities. NNXs are currently focused on initial activation, mobilization, and response activities.

The NNX is designed to require minimum resource expenditure and cause only limited disruption of facility/site or activity operations. In addition to the participation of initial responders, the site/facility or activity organization assigns a "trusted agent" to assist in the identification of a credible emergency scenario and to provide facility/site- or activity-specific information. The Headquarters (HQ) DOE/NNSA Office of Emergency Management (NA-41) schedules (with facility/site or activity concurrence), conducts, and documents the NNX and its evaluation, including the development and coordination of the exercise design package, providing an exercise director and controllers/evaluators, conducting participant and formal controller/evaluator critiques, and producing an After Action Report (AAR). Although the NNX program began as a HQ initiative, the approach can be readily adapted by a contractor organization as a tool in their self-assessment program.

The evaluation program should focus the available evaluation tools discussed above on the specific issues/problems identified through previous evaluations, tracking performance indicators, or other preparedness activities such as training and drills. Each tool has advantages and a scope that is appropriate for specific aspects of the emergency management program; each also has limitations that should be considered when applying

each to an issue. **Table 4-1** provides some indication of the focus and limitations of these tools.

According to DOE O 151.1C, DOE/NNSA facilities/sites and activities are expected to implement an emergency management self-assessment program to identify problem areas (Cf. Section 4.6). An effective **self-assessment** can include more than a single annual program evaluation or exercise evaluation. A broader interpretation includes the usual internal evaluations together with data collected from various observations, review and monitoring activities over course of the year. This involves a systematic selection of the areas and program elements for emphasis. A robust self-assessment program, in addition to likely becoming the major component of the *readiness assurance* program in the future, will assist in ensuring that problems are self-identified and corrected, without requiring the influence of external evaluators.

Table 4-1. Focus and Limitations of Evaluation Tools

<i>Method</i>	<i>Focus</i>	<i>Limitation</i>
LSPT	Single function or venue performance	Generally does not involve the full ERO, so not all functions and interactions are evaluated; isolated decision-making.
Tabletops	Integrated decision-making	Focused on decision-making, not on resulting performance
Facility & Site Exercises	Onsite integrated response	Interactions with offsite responders not observed
Full Participation Exercise	Integrated offsite and onsite response	Response to only one scenario
NNX	ERO	Lack of consequence data to expand exercise play
Program Evaluation	Comprehensive response planning	No performance observed
Self-Assessment	Detailed, comprehensive review	Limited evaluation by owners of program

4.3.2 Improvement Program

A strategic objective of an emergency management readiness assurance program should be continuous improvement. A strong, reliable readiness assurance program will help an organization ensure that appropriate and timely improvements are made in response to needs identified and will provide the organization with a direction and a path forward to achieve an effective and efficient emergency management program. The two key elements of a *readiness assurance* improvement program include:

- Corrective Action Program
- Lessons Learned Program

Corrective Action Program. A corrective action program is a readiness assurance process for continuously improving an emergency management program. This continuous

improvement results from reliable implementation of corrective actions for findings (e.g., Deficiencies, Weaknesses) in all types of evaluations, including both internal self-assessments and external evaluations.

A Corrective Action Plan (CAP) is the formal documented response to findings that have been identified in program and exercise evaluations or through observations in other preparedness activities, such as training and drills. The corrective action itself consists of the means, measures, and methods proposed by the emergency management organization for addressing and fixing the identified problem area.

In preparing/writing a CAP, the conditions, circumstances, situation, and causal factors that led to the finding should be described. A description of the specific corrective action(s) that will be taken to remove the cause of the problem and to resolve the finding must be addressed. The extent and prevalence of the same or similar problem area should also be indicated in the write up. Completion of corrective actions must include a verification and validation process, independent of those who performed the corrective action, that *verifies* that the corrective action has been put in place and *validates* that the corrective action has been effective in resolving the original finding. A general description of the conduct of an independent corrective action effectiveness review for verification and validation should be included with the CAP.

Corrective actions that address revision of procedures or training of personnel are particularly urgent and should be assigned a high priority and completed before the next evaluation of the program. In contrast, a corrective action may require some time before it is finally in place. As necessary, non-permanent interim measures should provide control over a deficient situation or condition to limit the hazard or the possibility of emergency response failure. Any interim measures or compensatory actions should be described in the CAP.

The recommended content of a CAP is summarized below:

- Conditions, circumstances, situation, and/or causal factors that led to the finding
- Extent and prevalence of similar or the same/repeat problem area
- Specific corrective action(s) that will be taken to remove the cause of the problem and to resolve the finding
- Interim measures or compensatory actions taken
- General description of the conduct of an independent corrective action effectiveness review for verification and validation

These recommendations can be used for self-assessment corrective actions and for corrective actions where the required content of the formal *corrective action* is unspecified. Detailed requirements associated with the management of specific Departmental corrective actions are contained in DOE O 414.1C, *Quality Assurance*.

Each emergency management organization should maintain (at least) an internal system for ensuring that corrective actions are acknowledged and progress in implementing corrective actions is tracked. Tracking systems should enable managers to identify corrective action status (open/closed), to assign responsible staff, to ensure that scheduled commitments for corrective action are met and that the effectiveness of corrective actions is validated. Tracking systems may also enable organizations to sort corrective actions and collect data by category and cause. This can help organizations to more effectively focus on prevention and improvement. Data concerning corrective actions may also be monitored in the organization's site performance measurement program.

Program responsibilities for acting on corrective actions are stated in DOE O 470.2A, *Security and Emergency Management Independent Oversight and Performance Assurance Program*, Attachment 2, *Contractor Requirements Document*, as follows:

- When notified of a significant vulnerability, responsible contractor organizations must:
 - Promptly identify and implement immediate corrective actions to mitigate the identified risk or vulnerability.
 - Develop and implement long-term actions to eliminate the vulnerability or reduce the level of risk to an acceptable level as soon as possible.
- Contractors must prepare, implement, and track to completion approved preliminary, interim, and final CAPs that address issues and concerns identified during the assessments and evaluations.
- CAPs are to be based on analysis of underlying causal factors to determine if systemic program weaknesses exist.

[A more detailed description of contractor assurance programs, including information related to issues management and corrective action systems, can be found in DOE Order 226.1, *Implementation of Department of Energy Oversight Policy*.]

Lessons Learned Programs. Decision-making, planning, and execution of work should be founded on the best professional and industrial practices available. DOE/NNSA management has placed significant emphasis on the concept of lessons learned across multiple health and safety disciplines, to ensure that knowledge and experience is shared among individuals and organizations in order to benefit from the experiences of others. Broad application of the lessons learned concept is important to the Department's commitment to maintain effective Integrated Safety Management Systems (ISMS). Outside the DOE, corporations, government agencies and departments, and the military are actively using lessons learned information to help them achieve their varied goals and missions.

The emergency management community is committed to benefiting from the experiences, good and bad, of our peers, both from within and outside the DOE/NNSA

complex. A lesson learned may be a “good practice” or innovative approach that is captured and shared to promote repeat application. A lesson learned may also be an adverse practice or experience that is captured and shared to avoid recurrence. A lessons learned program is a principal component of emergency management organizations whose culture is committed to continuous improvement. As such, an emergency management lessons learned program should strive to:

- Reduce the number of problems encountered by sharing information.
- Improve program efficiencies and effectiveness by exchanging information and experience with others in emergency management.

The following are important functions of an effective emergency management lessons learned program:

- 1) **Identify:** Mechanisms should be in place to identify lessons learned
- 2) **Document:** A process for documenting lessons and “success stories”
- 3) **Validate:** Validate the lessons learned to ensure each is meaningful and not repetitious
- 4) **Store:** A database for capturing and storing lessons learned information
- 5) **Share:** Forum for sharing information between organizations, both within the site organization and within the broader DOE community. The EMI SIG provides such a forum for the DOE complex. [The DOE Society for Effective Lessons Learned Sharing (SELLS) also provides complex-wide forum for more generally applicable lessons learned to be found at: <http://hss.energy.gov/CSA/Analysis/ll/sells.>]
- 6) **Evaluate:** Establish a formal method or process to evaluate the applicability of lessons learned to the site or its facilities.
- 7) **Incorporate and utilize:** Incorporate the actions to address applicable lessons learned into the site/facility corrective action tracking system. Use lessons learned to improve the program.
- 8) **Follow-up:** Follow-up process is implemented to ensure actions are taken

In summary, an effective readiness assurance program includes a system for incorporating and tracking lessons learned from training, drills, actual responses, and a site-wide lessons learned program. DOE-STD-7501-99, *The DOE Corporate Lessons Learned Program*, provides guidance on use of the system. Additional information on Lessons Learned programs can be found in the SELLS website within DOE.

4.3.3 Documentation of Readiness Assurance

ERAPs are documented assessments of the development, implementation, and maintenance of Emergency Management Programs. The ERAP is also a planning tool to identify and develop needed resources and improvements. An ERAP highlights significant changes in emergency management programs (i.e., planning basis, organizations, and exemptions) and compares actual achievements to goals, milestones and objectives. The information reported in the ERAP should provide assurances to the organization's management as well as DOE/NNSA Headquarters that emergency management programs are "*ready to respond*." The ERAP is designed to be an emergency preparedness management tool for all levels of management.

While the provisions of the facility/site or activity readiness assurance program are documented in the emergency plan, the ERAP documents the annual assessment of readiness assurance activities. The ERAP provides detailed information on an annual basis about how continuous improvement in the emergency management program is being achieved and how the complimentary tools of program and exercise evaluations are being used to ensure that the emergency management program is ready to respond.

Following the direction of the Government Performance Results Act (GPRA – 31 U.S.C. 1115 and 1116), the time period for ERAP coverage was reduced to the immediate past fiscal year and the new fiscal year in DOE O 151.1C. The ERAP includes the goals for the immediate past fiscal year and compares those what was accomplished during the past year, and identifies the goals established for the new fiscal year. For example, a facility/site ERAP submitted on 9-30-07 would compare the progress made during FY07 (10-1-06 to 9-30-07) against the goals that had been set for FY07, as well as identify the goals that were set for FY08 (10-1-07 to 9-30-08).

In addition, the ERAP should contain the results of emergency preparedness activities, external evaluations/assessments, self-assessment activities, exercise after-action reports, corresponding corrective action plans, improvements based on the lessons learned program, and summary information about the facility/site or activity emergency management program in sufficient detail to be understood by managers that are not in direct contact with the program. Appendix C contains format and content guidance for the ERAP. The following general guidance regarding content should also be applied:

- The level of detail should not be voluminous.
- Include information that will help support the improvements needed for the program.
- Details about daily processes are not relevant.
- Ensure that information included is complete and accurate.
- The most detailed information should be from the past year.

DOE O 151.1C contains specific requirements addressing submittal and review and the general requirements for the ERAP summarized as followed:

- The facility/site or activity contractor is responsible for preparing the ERAP.
- An ERAP may require review for classified or controlled information prior to submittal.
- It must be submitted to the cognizant Field Element manager for approval.
- The cognizant field element manager should review the ERAP; comments should be addressed to the contractor representative.
- ERAPs should be consolidated for facilities/sites and activities under the supervision of the Cognizant Field Element Manager.
- The consolidated ERAP should also contain the same type of discussion regarding the emergency management program at the Cognizant Field Element level as is contained in the facility/site or activity ERAP
- The consolidated ERAP should be submitted to the Associate Administrator for Emergency Operations and the responsible Program Secretarial Officer each year

The Associate Administrator for Emergency Operations will prepare, in coordination with the responsible Program Secretarial Officers, an annual report summarizing the status of the DOE Emergency Management System.

4.3.4 Management Commitment

Management leadership, commitment, and active involvement are essential for emergency management program improvement. Management should be made aware of the requirements and performance expectations in order to integrate these with the strategic plans of the organization. Site and facility managers should be kept informed and involved in the emergency management program.

Management should review the emergency management program at planned intervals to ensure its continuing suitability, adequacy, and effectiveness. This review should include assessing opportunities for improvement and the need for changes. Records from management reviews should be maintained. Input to management reviews should be provided by personnel responsible for emergency management and should include information related to:

- Exercise performance
- Results of internal and external evaluations
- Findings involving the emergency management program
- Complaints or significant communications with offsite agencies

- Status of corrective actions
- Emergency management performance measures and progress in meeting targets
- Changes in regulatory and statutory requirements that may impact resource needs of the emergency management program
- Changes at the facility/site that may impact preparedness or response
- Recommendations for improvement
- An annual ERAP report

Site and facility management should ensure that necessary interface and cooperation is maintained between emergency management and the various departments at the facility/site. The nature of emergency management requires effective ongoing coordination and cooperative interfaces with organizational groups such as medical, fire/Hazardous Materials (HAZMAT), training, environmental health and safety, health physics, engineering, information systems, security, public affairs/media relations, etc.

Line management participation is critical to ensuring that corrective actions are handled efficiently and effectively and that applicable lessons learned information is effectively distributed and implemented throughout the organization. Expectations of upper management must be communicated to line management. Performance measures established for the emergency management program should be linked with performance expectations of senior management and their commitment to the program.

Sufficient resources must be budgeted to maintain and improve the program. In considering resource needs to maintain emergency management and meet expectations for performance improvement, the following should be factored into requests to management:

- Current resources
- Changes at the facility/site that may impact preparedness or response. These may include physical, information systems, communication systems, organizational, and financial changes
- Changes in regulatory or statutory requirements
- Changes in response capabilities of external EROs
- Program effectiveness and achievement of performance goals over the past year
- Lessons learned (facility-specific, DOE/NNSA Complex and industry)
- New performance goals

- Corrective action commitments

Continued improvement and success of an emergency management program can only be ensured through management commitment to maintain a response capability that is “*ready*” to respond promptly, effectively, and efficiently to emergencies at DOE/NNSA facilities/sites and activities.

4.4 Evaluations

An emergency management program consists of diverse functions and activities whose collective objective is to ensure that response capabilities will be ready when needed and will be applied promptly, effectively, and efficiently. The successful accomplishment of this objective involves groups of emergency management functions and activities. These groups are included in the Program Elements of the DOE emergency management system. The evaluation of emergency management programs will focus on these elements as a convenient means for organizing the evaluation methodology and processes to be discussed in this EMG.

The general, overall performance goal (or mission) of DOE/NNSA emergency management programs can be summarized as follows:

DOE emergency management programs will be ready at all times to promptly, effectively, and efficiently apply the necessary resources to mitigate consequences and protect its workers, the public, the environment, and national security in the event of an Operational Emergency involving DOE/NNSA facilities/sites or activities.

The goal expresses the basic attributes of a DOE/NNSA emergency management program that determine its expected performance:

DOE emergency management programs will be ready at all times . . .

- DOE emergency management *response* is a *standby system*, which must be *ready* (i.e., “*ready on demand*”) to respond to an emergency event or condition when called upon.
- *Planning, preparedness, and readiness assurance* are continuous, ongoing activities of emergency management programs that enable *response* capabilities to be ready to respond . . . in the event of an OE.

. . . to . . . apply the necessary resources . . .

- The emergency management *response* activities will apply the necessary resources in the event of an OE.
- The application of necessary resources is the **OUTPUT** of the *response* activities of emergency management programs.

... promptly, effectively, and efficiently ...

- Resources will be applied promptly, effectively, and efficiently.
 - **Promptly:** Produces the effect or result in a timely manner, when needed
 - **Effectively:** Produces the desired effect or result
 - **Efficiently:** Produces the desired effect or result with a minimum of effort, resources, or waste; works well

... to mitigate consequences and protect its workers, the public, the environment, and national security ...

- The application of resources (i.e., **OUTPUT**) of the emergency management *response* will *mitigate consequences* and, in doing so, *protect* its workers, the public, the environment, and national security.
- The *mitigation of consequences* and *protection* of workers, the public, the environment, and national security are the ultimate objectives and desired **OUTCOME** of the emergency *response*.

... DOE/NNSA facilities/sites or activities.

- This guidance is focused on the response to OEs involving **DOE/NNSA facilities/sites or activities**.

The performance goal expresses the performance characteristics of the response **OUTPUT** and the desired results of its application, the **OUTCOME**. Since the ultimate objective of the emergency management program is to mitigate consequences and protect, it is the success in accomplishing this **OUTCOME** that should be evaluated.

However, only an actual emergency event can provide the circumstances and situations that in reality require urgent measures to protect workers, the public, the environment, or national security. Only an actual emergency event will produce realistic stress levels, challenging physical environments, time constraints, real information uncertainties, and operational problems. Hence, it is **only** during an actual response that the **OUTCOME** of the emergency response can be directly measured and judged and the true *readiness* of an emergency management program estimated. However, emergency events, especially OEs, are rare, and most that have occurred are not sufficiently complex to provide a comprehensive test of the overall program readiness. Another method is needed for evaluating emergency management programs and estimating program *readiness*.

The aspect of the performance goal that can be tested and evaluated on a routine basis is the capability of the emergency *response* to be ready at all times to promptly, efficiently, and effectively apply the necessary resources (i.e., the **OUTPUT**). Thus, in the absence of adequate response data from actual emergencies, a **basic, practical assumption** of the

methodology for evaluating DOE /NNSA emergency management programs is the following:

*An estimate of the “readiness” of the emergency management response to apply the necessary resources (the OUTPUT) will be the **best available estimate** (i.e., a surrogate) of the “readiness” of the response to mitigate consequences and protect personnel, the environment, and national security (the OUTCOME).*

This basic assumption represents the foundation of readiness assurance evaluation methodology, which focuses on performance-based evaluations of the **OUTPUT** of emergency management programs.

The first evaluation option to consider is an evaluation of performance during an integrated response to a simulated emergency scenario in an exercise. This direct observation of performance provides an excellent contribution to an estimate of *readiness*, and multiple tests would address a full spectrum of potential emergency events. However, this option is limited by the substantial resource requirements and its invasive effect on normal operations. These constraints result in a limited number of site-level, integrated operations-based exercises, usually one annually (per the DOE O 151.1C requirement), which is insufficient by itself to ensure that the response will perform as needed during any emergency.

The additional requirement for each facility on a site to conduct a facility-level operations-based exercise (per the DOE O 151.1C requirement) provides the opportunity to evaluate the performance of the facility-level Emergency Response Organization (ERO) components. These direct observations of performance at the facility-level provide an excellent contribution to an estimate of readiness of the emergency management program; multiple tests across the site can address a full spectrum of potential emergency events and response elements. However, essential site-level response assets may be only simulated during these exercises resulting in a test of integrated response limited to facility-level assets.

Hence, the limitations of the direct observation method, discussed above, lead to reliance on a *readiness* estimate for the system that also depends on *assurances* (i.e., convincing arguments to “inspire confidence”) that the response will perform as required. These assurances are based on a comprehensive evaluation of plans, procedures, supporting analyses, and the conduct of preparedness activities, **COMBINED** with evaluations of performance during formal exercises.

The emergency management system requires this combined approach for evaluating performance primarily because it is a standby system involving diverse and integrated functions and skills. Output failures in a continuously operating system of similar complexity will generally be discovered in real-time. In a standby system, failures will only be discovered when the system is called upon to operate. As a result, since demonstrations of response performance are limited, the standby system requires supporting activities involving planning, testing, and routine maintenance (e.g., training) to prepare the system to perform successfully on demand. Each activity has an essential

role in maintaining the readiness of the emergency management program and the performance of each will reinforce confidence in performance of the overall system. Hence, a robust readiness assurance program incorporates a focused group of diverse techniques for evaluating the actual or projected performance of the response and the continuing performance of its supporting and sustaining activities/functions.

4.4.1 Emergency Management Program Elements

The DOE/NNSA emergency management system consists of four core activities:

- Emergency *planning* including the identification of hazards and threats, hazard mitigation, development and preparation of emergency plans and procedures, and identification of personnel and resources needed for an effective response
- Emergency *preparedness* including the acquisition and maintenance of resources, training and drills, and exercises
- *Readiness assurance* including evaluations, improvements, and documentation to assure that stated emergency capabilities are sufficient to implement emergency plans
- Emergency *response* including the application of resources to mitigate consequences to workers, the public, the environment, and the national security, and the initiation of recovery from an emergency

In order to more clearly indicate the roles that the fifteen (15) Program Elements of the emergency management program perform, they are separated into the following three groups: Technical Planning Basis (Planning), Programmatic Activities (Planning, Preparedness, Readiness Assurance), and Response Activities.

As indicated above, these groups represent the core emergency management activities and encompass the fifteen (15) Program Elements of the DOE/NNSA emergency management program:

- **TECHNICAL PLANNING BASIS**
 - Hazards Survey/Hazards Assessment
- **PROGRAMMATIC** (“*ongoing*” activities)
 - Program Administration
 - Training and Drills
 - Exercises
 - Readiness Assurance
- **RESPONSE** (“*standby*” activities)
 - Emergency Response Organization (ERO)

- Offsite Response Interfaces
- Emergency Facilities and Equipment
- Categorization and Classification
- Communication and Notification
- Consequence Assessment
- Protective Actions and Reentry
- Emergency Medical Support
- Emergency Public Information
- Termination and Recovery

The above grouping separates the program elements by role into the technical planning foundation of the program, the “ongoing” *programmatic* activities that sustain the program, and the “standby” *response* elements that respond or contribute to response as needed in an emergency.

Fundamental emergency management activities are clearly distinguishable by the time frame during which they perform. In general, “ongoing” *programmatic* elements include activities that take place on a continuous, periodic, or as-needed basis during normal conditions to maintain the *readiness* of the program to respond to an emergency. In contrast, *response* elements are normally in a standby mode and are activated to respond to an emergency event or condition. *Response* elements include the organizational structure, functions, products, activities, response tools, etc., that directly participate in or contribute to a response to mitigate consequences of an emergency.

Within each of the program elements, specific activities, tasks, products, etc., and their related plans, procedures, and tools contribute to the successful accomplishment of the intended OUTPUT product(s) in each specific area. Examples of individual products can include: event classification, press briefings, source term estimates, Protective Action Recommendations (PARs), consequence versus distance calculations, exercise program for the site, training plans, effectively trained ERO personnel, detection equipment requirements, meetings with public or offsite response organizations, Emergency Planning Zone (EPZ), etc.

The intended OUTPUT from each function or activity is evaluated in terms of the desired qualitative and/or quantitative performance characteristics of each of the products. These performance characteristics are determined by the role that the OUTPUT plays in meeting the overall emergency management performance goal. The resulting evaluations will be referred to as **performance-based evaluations**, where the focus of the evaluation methodology is not on specific, prescriptive details of plans, procedures, calculation techniques, administrative structure, etc., but on the desired performance characteristics of the resulting OUTPUT.

The collective performance associated with the program elements supports the overall performance goal of emergency management programs. In order to provide a logical structure for evaluating the overall emergency management program, an individual performance goal has been developed for the OUTPUT of each program element. These goals were derived from the requirements of DOE O 151.1C, *COMPREHENSIVE EMERGENCY MANAGEMENT SYSTEM*, augmented with additional guidance from the *EMG* (DOE G 151.1-series), other DOE-directives, and other Federal, tribal, state, and local regulations.

Program Element Performance Goals - Technical Planning Basis

1. **Hazards Survey.** An examination of the features and characteristics of the facility/site or activity that identifies the generic emergency events and conditions and the potential impacts of such emergencies to be addressed by the DOE Comprehensive Emergency Management System. The Hazards Survey identifies key components of the Operational Emergency Base Program that provide a foundation of basic emergency management requirements and an integrated framework for response to serious events involving health and safety, the environment, safeguards, and security. For facilities/sites and activities involved in producing, processing, handling, storing, or transporting hazardous materials that have the potential to pose a serious threat to workers, the public, or the environment, the Hazards Survey provides a hazards screening process for determining whether further analysis of the hazardous materials in an Emergency Planning Hazards Assessment (EPHA) is required.
2. **Emergency Planning Hazards Assessment (EPHA).** Performed for each facility/site and activity involving at least one candidate hazardous material, as identified through the hazardous material screening process and indicated in the Hazards Survey. EPHAs involve the application of rigorous hazards analysis techniques that provide sufficient detail to assess a broad spectrum of postulated events or conditions involving the potential onsite release of (or loss of control over) hazardous materials and to analyze the resulting consequences. Each EPHA reflects both the magnitude and the diversity of the hazards and the complexity of the processes and systems associated with the hazards, and provides the technical planning basis for determining the necessary plans/procedures, personnel, resources, equipment, and analyses [e.g., determination of an Emergency Planning Zone (EPZ)] for the Operational Emergency Hazardous Material Program.

Program Element Performance Goals - Programmatic Elements

1. **Program Administration.** Effective organizational management and administrative control of the facility/site or activity emergency management program is provided by establishing and maintaining authorities and necessary resources commensurate with the responsibility to plan, develop, implement, and maintain a viable, integrated, and coordinated comprehensive emergency management program.
2. **Training and Drills.** A comprehensive, coordinated, and documented program of training and drills is an integral part of the emergency management program to ensure

that preparedness activities for developing and maintaining program-specific emergency response capabilities are accomplished.

3. **Exercises.** All elements of an emergency management program are validated over a multi-year period through a formal exercise program. The exercise program validates facility- and site-level emergency management program elements by initiating response to simulated, realistic emergency events/conditions in a manner that replicates an integrated emergency response to an actual event as nearly as possible. Planning and preparation use an effective, structured approach that includes documentation of specific objectives, scope, time lines, injects, controller instructions, and evaluation criteria for realistic scenarios. Each exercise is conducted, controlled, evaluated, and critiqued effectively and reliably. Lessons-learned are developed, resulting in corrective actions and improvements.
4. **Readiness Assurance.** A Readiness Assurance program provides a framework and associated mechanisms to assure that emergency plans, implementing procedures, and resources are adequate and sufficiently maintained, exercised, and evaluated (including evaluations and assessments) and that appropriate, timely improvements are made in response to needs identified through coordinated and comprehensive emergency planning, resource allocation, training and drills, exercises, and evaluations.

Program Element Performance Goals - Response Elements

1. **Emergency Response Organization.** An Emergency Response Organization (ERO), a structured organization with overall responsibility for initial and ongoing emergency response and mitigation, is established and maintained. The ERO establishes effective control at the event/incident scene and integrates local agencies and organizations providing onsite response services. An adequate number of experienced and trained primary and alternate response personnel are available on demand for timely and effective performance of ERO functions.
2. **Offsite Response Interfaces.** Effective interfaces are established and maintained to ensure that emergency response activities are integrated and coordinated with the Federal, Tribal, State, and local agencies and organizations responsible for emergency response and the protection of workers, the public, and the environment.
3. **Emergency Facilities and Equipment.** Facilities and equipment adequate to support emergency response are available, operable, and maintained. Specifically, an adequate and viable command center is available as necessary and personnel protective equipment is available and operable to meet the needs of the responders.
4. **Categorization and Classification.** Major unplanned or non-routine events or conditions involving or affecting DOE or NNSA facilities/sites or activities by causing or having the potential to cause serious health and safety impacts onsite or offsite to workers or the public, serious detrimental effects on the environment, direct harm to people or the environment as a result of degradation of security or safeguards

- conditions, or release of (or loss of control over) hazardous materials, are recognized promptly, categorized, and declared as OEs. In addition to being categorized as OEs, events involving the actual or potential airborne release of (or loss of control over) hazardous materials from a facility/site or activity also require prompt and accurate classification based on health effect thresholds (for initiating protective actions) measured or estimated at specific receptor locations (i.e., facility and site boundaries, etc.) Predetermined conservative onsite protective actions and offsite protective action recommendations are associated with the classification of these OEs.
5. **Notifications and Communication.** Prompt, accurate, and effective initial emergency notifications are made to workers and emergency response personnel/organizations, including appropriate DOE or NNSA elements, and other Federal, Tribal, State, and local organizations and authorities. Accurate and timely follow-up notifications are made when conditions change or when the classification is upgraded or the emergency is terminated. Continuous, effective, and accurate communications among response components and/or organizations are reliably maintained throughout an OE.
 6. **Consequence Assessment.** Estimates of onsite and offsite consequences of actual or potential releases of hazardous materials are correctly computed and assessed in a timely manner throughout the emergency. Consequence assessments are integrated with event classification and protective action decision-making, incorporate facility and field indications and measurements, and are coordinated with offsite agencies.
 7. **Protective Actions and Reentry.** Protective actions are promptly and effectively implemented or recommended for implementation, as needed, to minimize the consequences of emergencies and to protect the health and safety of workers and the public. Protective actions that can be implemented individually, or in combination, to reduce exposures from a wide range of hazardous material types, include evacuation, sheltering, decontamination of people, medical care, ad hoc respiratory protection, control of access, shielding, radio protective prophylaxis (e.g. administration of stable iodine, chelating agents, or diuretics), control of foodstuffs and water, relocation, decontamination of land and equipment, and changes in livestock and agricultural practices. Protective actions are reassessed throughout an emergency and modified as conditions change. Reentry activities are planned, coordinated, and accomplished properly and safely.
 8. **Emergency Medical Support.** Medical support is provided for workers contaminated by hazardous materials. Arrangements with offsite medical facilities to transport, accept, and treat contaminated, injured personnel are documented.
 9. **Emergency Public Information (EPI).** Accurate, candid, and timely information must be provided to workers, the news media, and the public during an emergency to establish facts and avoid speculation. Emergency public information efforts must be coordinated with State, Tribal, and local governments, and be part of Federal emergency response plans as appropriate. Workers and the public are informed of emergency plans and planned protective actions before emergencies.

10. Termination and Recovery. An OE is terminated only after a predetermined set of criteria has been met and termination has been coordinated with offsite agencies. Recovery from a terminated OE involves communication and coordination with Tribal, State, local, and other Federal agencies; planning, management, and organization of the associated recovery activities; and ensuring the health and safety of workers and the public.

The performance goals are deliberately general and broadly based in order to apply to all Operational Emergency Hazardous Material Programs across the DOE complex. The performance described implies no facility/site- or activity-specific characteristics, such as diversity and number of hazards, size of site, number of facilities, ERO composition, etc. Each goal characterizes the performance of a group of emergency management functions/activities that support the functional area indicated by the program element title. The collective performance described in the goal does not imply that the individual functions or activities associated with the program element are necessarily dependent on one another so that a single failure or several failures in the functional area fail the whole element.

4.4.2 Program and Exercise Evaluations

Two methods are recommended for obtaining complementary estimates of the *readiness* of an emergency management program to respond, namely, program and exercise evaluations:

- A **program evaluation** involves an assessment of an emergency management program based on a comprehensive examination and evaluation of response plans and procedures, administrative control mechanisms, planning basis and supporting analyses, response tools (e.g., computer models), resource availability, training activities and results, training validation (i.e., individual testing of trained personnel), overall exercise program, organizational factors, etc.
- An **exercise evaluation** involves an assessment of an emergency management program based on the observation and evaluation of the demonstrated integrated performance of response capabilities during simulated emergency event(s) or condition(s). The exercise evaluation is usually combined with an evaluation of the validity of the specific exercise (i.e., Conduct of Exercise) as a viable test of the *readiness* of the program to respond.

The *technical planning basis* and *programmatics* activities are generally evaluated during a **program evaluation**. The evaluation focuses on observables associated with the INPUT to the activity, the characteristics and conduct of the ACTIVITY itself, and the OUTPUT of the activity. *Response* activities are also evaluated during program evaluations. However, since there is no observation of response to an emergency event (as in exercises), the evaluation must depend on expert extrapolation from the response planning, procedures, and available tools to an anticipated or projected response. The evaluation consists of a judgment of the anticipated or projected performance based solely on review and analyses of the planning and preparedness activities.

Evaluation of *response* activities during a **drill or exercise** involves an assessment of the demonstrated performance of integrated response capabilities, based on observation and evaluation of the actual OUTPUT from each program element. Exercise evaluation will determine whether and how well *response* functions and activities are performed based on observations during a specific (simulated) emergency scenario. [Note that some *programmatic* activities are evaluated during an exercise to determine the reliability of the planning and conduct of the exercise. This assessment (i.e., Conduct of Exercise) provides an indication of the value of the observed performance during a specific exercise in estimating the expected response during an actual emergency.]

ERO personnel perform *response* functions and participate in activities during an exercise; actual failures in performance can be observed. Similarly, during an assessment of a *programmatic* element (e.g., Training and Drills) in a **program evaluation**, inadequate or ineffective training of response personnel might be discovered through a record search or individual testing. This will also be an actual failure, where accomplishments of the training program do not meet emergency management program expectations. In contrast, during a program evaluation of a *response* element, the plans, procedures, and tools for a specific activity are evaluated to determine whether they are accurate, clear, unambiguous, effective, timely, etc. If they were found to meet expectations by an evaluator, then, based on the materials evaluated or interviews with the ERO personnel, the desired OUTPUT of the activity during a response would be satisfactory. In other words, no projected failure would be suggested by the program evaluation. On the other hand, if the procedures were incorrectly written or the expected OUTPUT not appropriate, then a failure might be projected (considered likely) during an emergency response.

It is common practice during program evaluations to construct LSPTs to be administered to ERO staff in order to validate their proficiency in performing certain response tasks (e.g., classification, protective action decision-making) for which they would be responsible during an emergency response. These tests validate the effectiveness of the training received and are essential for evaluating the performance of the Training and Drills, a *programmatic* element. However, they should be interpreted as one indicator of projected performance, but not as sufficient to characterize expected performance as is a well-planned and conducted, quality exercise or during an actual response to an emergency.

As stated in the beginning of this section, two methods are recommended for obtaining complementary estimates of the *readiness* of the response capabilities of an emergency management program, namely, program and exercise evaluations. Neither type of evaluation is sufficient by itself to provide a complete measure of the readiness of the emergency management program. **Program evaluation** is comprehensive in terms of hazards and activities. It provides a measure of the applicability of the planning associated with the program, as well as an evaluation of the adequacy of *programmatic* activities that ensure the maintainability of the program in sustaining a high level of proficiency over time. Program evaluation, however, lacks a true evaluation of actual,

integrated performance of response capabilities as observed in a real or simulated emergency event.

Exercise evaluation, on the other hand, provides such an evaluation of response performance during a simulated emergency scenario. However, since the scenario involves only selected response capabilities and personnel appropriate to the emergency event, the evaluation of the exercise is insufficient to generalize the overall capabilities of the response. The exercise is a snapshot in time that captures and evaluates performance in response to the specific event. Each scenario demands a unique, detailed response from emergency management functions and activities (e.g., the specific EAL; the associated protective actions; the consequence assessment calculations; the procedures used; the medical situation encountered; the specific content of news releases). Although the processes for some general response functions/activities are accomplished similarly for each type emergency (though the detailed results are unique), the exercise evaluation does not provide a comprehensive, overall assessment of the adequacy of the emergency management program in responding to a spectrum of emergency events or in maintaining the readiness of the program over time.

Finally, the *readiness* of an emergency management program is best estimated by an assessment of the combination of complementary results from program and exercise evaluations and, when available, post-emergency evaluations. However, in order to perform these evaluations, performance-based criteria must be developed to provide a means for consistently judging the critical aspects of emergency management program element performance. In the next section, performance-based criteria for evaluating emergency management program elements are introduced.

4.4.3 Evaluation Criteria

Generic performance-based criteria have been developed to support the evaluation of specific emergency management performance goals (Cf. Section 4.4.1) for each program element of an Operational Emergency Hazardous Material Program. The criteria are based generally on the requirements of DOE O 151.1C, augmented with guidance from the DOE G 151.1-series, and other Federal, State, and general local requirements applicable to DOE emergency management programs. Consistent with the performance goals, the criteria are also intentionally generic and broad-based to accommodate the diversity of hazards and response capabilities associated with facilities/sites and activities within the DOE/NNSA complex, and to provide a consistent framework for judging emergency management performance complex-wide.

Fifteen sets of criteria, grouped by program element, are given in Appendix D of DOE G 151.1-3. Each criterion is labeled to differentiate among those assessed during to program (P) evaluations, exercise (E) evaluations, or both (P/E). If program and exercise evaluations are to be treated as complementary estimates of program readiness, it follows that response elements must be judged using the same performance goal and performance-based criteria (P/E).

In several *response* program elements, there are number of instances where selected *ongoing* or *programmatic* activities are included that maintain the response aspects of the specific program element. For example, the activity that ensures that ERO rosters are kept current with trained and qualified responders is a routine function that maintains the *readiness* of the responder organization. A routine test and maintenance program for emergency facilities and equipment maintains the *readiness* associated with the Emergency Facilities and Equipment. These types of activities should be considered part of a comprehensive evaluation of programmatic activities during a program evaluation. Criteria applicable to these *programmatic* functions (P) are indicated as such in Appendix D.

Exercise evaluators should not use the criteria contained in Appendix D as given. Program-specific expectations and characteristics should be developed for each emergency management program, based on facility/site- or activity-specific hazards and associated program capabilities (e.g., derived from existing plans and procedures). From these attributes, generic criteria can be restated in the context of the specific program. This facilitates the evaluator's task by bounding the general intent and scope of the function or activity, as expressed in the generic criteria, and focusing on the key program-specific attributes incorporated in the revised criteria. In contrast, during a **program evaluation**, the generic criteria for programmatic and response elements are used as the standard against which the plans/procedures and preparedness activities are judged in the context of the facility/site- or activity-specific hazards, associated program capabilities, and "commensurate with hazards" concept. As a result, the program-specific criteria for a program element that reflect the hazards, plans, size of the ERO, and other characteristics, may be a subset of the generic criteria given in Appendix D.

4.4.4 Findings

Program and exercise evaluations consist of numerous individual judgments related to the adequacy of projected or demonstrated performance in specific emergency management functional areas. These judgments are expressed in terms of meeting or failing to meet expectations expressed by a specific evaluation criterion. The necessary information for making such judgments is obtained from numerous data sources, including: document and record reviews, direct observations, personnel interviews, selected testing of personnel performance, and critiques.

Inadequate or failed actual or projected performance identified during an evaluation is referred to as a *finding*. A *finding* describes a failure related to a criterion. Findings are ranked as either a Weakness or Deficiency to reflect the significance of the failed criterion in adversely impacting actual or projected performance (i.e., **OUTPUT**) of the program element. A Deficiency has a more significant impact on the program element **OUTPUT** than a Weakness. The Deficiency also indicates a greater urgency associated with implementing the appropriate corrective action and fixing the problem than associated with a Weakness.

For either a program or exercise evaluation, a Deficiency is defined as follows:

*A **Deficiency** is an actual or projected failure to meet an evaluation criterion, thereby directly impacting the associated basic emergency management activity, such as planning, preparedness, readiness assurance, or response.*

A direct impact on an emergency management activity resulting from a failure to meet a single evaluation criterion will, by itself, adversely affect the associated performance-based OUTPUT of the program element. The adverse effect of the failure should be significant and readily apparent. For example, in Consequence Assessment (a *response* element), failure to conduct a Timely Initial Assessment (TIA) of the consequences of an emergency has a direct impact on the response activity, since consequence assessment results serve as a basis for the initial timely decision-making following pre-planned (default) conservative decisions. Failure of the Hazards Survey/EPHA to analyze potential emergency events or conditions representing a spectrum of severity has a direct impact on the planning activity, because the Hazards Survey/EPHA serves as the comprehensive planning basis for the emergency management program.

For either a program or exercise evaluation, a Weakness is defined as:

*A **Weakness** is an actual or projected failure to meet an evaluation criterion, thereby contributing to a direct impact or indirectly impacting the associated basic emergency management activity, such as planning, preparedness, readiness assurance, or response.*

A failure that contributes to a direct impact on or indirectly impacts an emergency management activity results from a failure to meet a single evaluation criterion that adversely affects a supporting or auxiliary role in the accomplishment of the emergency management activity. For example, failure to maintain a controlled document system as part of Program Administration (a *programmatic* element) contributes to a direct impact on the planning activity, because the latest procedures or hazards information might not be available during a response. Failure to plan for extended operations of the ERO (a *response* element) has an indirect impact on the response activity, since members of the ERO need respite from their assigned activities; fresh personnel are more likely to make better decisions than tired personnel.

When determining direct, contributing to direct, or indirect impacts on emergency management activities, the following should be considered. The impact in a specific functional area is on the OUTPUT of the activity. The impact cannot be judged on the actual or projected OUTCOME of the emergency management programs response, since there are no measures to realistically judge the OUTCOME during either a program or exercise evaluation. A direct impact cannot be judged on an unsupported evaluator's prediction of an adverse direct impact. A finding that represents an indirect impact based on its intended function cannot become a direct impact simply because the evaluator can conceive of a scenario that explains how the failure could ultimately combine with other failures to produce a direct adverse impact. Such extrapolations simply cannot be supported by evidence gathered during the evaluations.

Finally, the recommended approach [Cf. DOE G 151.1-3, Chapter 3] for developing exercises that test emergency response capabilities identifies a specific set of exercise objectives to be achieved. The *finding* definitions should be used only to address failure of a specific evaluation criterion. However, although some exercise objectives may correspond to just one evaluation criterion, a more likely situation would have multiple criteria associated with an exercise objective. In that case, the definitions of Deficiency and Weakness should **NOT** be applied to the failure of the exercise objective, but to each of the evaluation criteria. When multiple evaluation criteria are reflected in an exercise objective, then the failure of the objective should be judged by the combined (“rolled-up”) assessment of the total results for the objective, namely, those criteria that were achieved versus those that were not.

Finally, findings will be directly associated with a specific emergency management program element and hence will point to problems specific to the element through the characterization of the evaluation criterion. However, to identify problems that are systemic across elements, it is useful to determine the general characteristics of the failure. In the following section, the format for *labeling* or *binning* findings is presented in terms of generic faults. Such a system can facilitate analyses of a collection(s) of findings by emphasizing the generic (observed) fault that may have caused the failure of diverse criteria across program elements.

4.4.5 Generic Faults

In this section, a technique is presented for analyzing findings across program elements or from multiple evaluations. The technique is most appropriate for large numbers of *findings*. Large sites with multiple facilities or HQ offices with responsibilities over multiple sites and facilities could potentially benefit most from the resulting analyses. Smaller sites with limited numbers of facilities and *findings* can usually analyze failures by a simple review (i.e., reviewing/analyzing each individual finding and then generalizing about cross-cutting faults.).

To assist in revealing systemic (i.e., cross-cutting) problems common to multiple elements of a specific program or even DOE complex-wide, *findings* from program and exercise evaluations can be grouped using a generic fault system. These generic faults characterize identified failures that represent actual or projected failure to meet criteria. In order to facilitate analyses, generic faults have been developed to further clarify and refine the characterization of specific failures that reflects as nearly as possible the bases for the *findings*. The method provides the means for a structured and comprehensive examination of *findings* both within sites and DOE-wide.

Findings associated with diverse functional areas identified during an evaluation can be further characterized by using specific generic faults. For example, confusing or inadequate emergency plans/procedures identified in several *response* program elements during a program evaluation might be represented by a generic fault associated with the adequacy of plans and procedures. Evaluation of *findings* for this specific emergency management program may indicate the need for a re-look at how plans and procedures are written. Similarly, if communication failures occur in various *response* elements

during an exercise evaluation, then the assigned generic fault might be related to general communication and information flow. In this case, an analysis of multiple *findings* might reveal a general weakness in the communication skills of the ERO members or in the protocols used.

The following are candidate Generic Faults for use in characterizing *findings* from evaluations:

1. **Implementation:** Failures related to the translation of DOE requirements, policy or guidance into specific plans, procedures and preparations for conducting effective emergency management activities planning, preparedness, readiness assurance, and emergency response. Site plans and procedures do not make provision for meeting specific Order requirements. Site procedures, documents, and preparations do not exist for the effective accomplishment of emergency actions as described in the site Emergency Plan.
2. **Performance:** Failures related to the actions of staff in carrying out preparedness or response actions. Personnel fail to carry out an approved response procedure. Failure to accomplish planning/preparedness activities necessary to support effective response, if the inadequacy is due to personnel performance and not to some other cause, such as inadequate procedures or resources.
3. **Roles/Responsibilities:** Failure of an assigned individual to assume a specific role; an unclear, missing or conflicting formal designations of responsibility for carrying out emergency management functions; or, the exercise of specific capacities or functions by assigned personnel in an emergency response.
4. **Interfaces/Coordination:** Failures in links or connections that are established between different organizations to support emergency planning and preparedness: inadequate cooperative/joint planning or lack of agreement on how to respond to certain circumstances. Failures might involve incompatible terminology, uncoordinated response actions, disputed authorities, or ineffective division of roles and responsibilities.
5. **Decision Making:** Failures related to the exercise of management-level decision-making authority for the response process as a whole, or any part of it. Failure to make sound decisions based on available information, and to any procedures, processes, or criteria that would lead to unsound decisions regarding important response actions.
6. **Control:** Failures related to management-level direction of response actions and allocation of resources, continuity and effective use of authority and responsibility.
7. **Communication:** Failures in the act of transfer of information between response facilities, personnel, and organizations as part of emergency response; failures or inadequacies in the communication of facts, status, decisions, directions or actions. Not including communication equipment failures.

8. **Plans and Procedures:** Failures related to plans and procedures, in hard copy or electronic form, which provide direction to planning, preparedness and response activities. The plans or procedures do exist, but are found to have factual or editorial errors that would degrade the effectiveness of response, are not internally consistent, or are not current.
9. **Documentation:** Failures related to reports, agreements, and other documents, excluding Plans/Procedures and Records, in hard copy or electronic form, which provide technical planning basis and support/direction to planning, preparedness and response activities. EPHAs, training materials, lesson plans, and training manuals; understandings and agreements; protocols (e.g., communication, medical, control); or other emergency management documents are found to have factual or editorial errors that would degrade their effectiveness, be internally inconsistent, or not maintained current.
10. **Records:** Failures related to logs, event chronologies and data sheets generated during emergency response or exercises; medical records; equipment and facility test and maintenance records, staff training and qualification records; or documentation of meetings, planning decisions, or any other past events/ occurrences that form part of the planning basis, in hard copy or electronic form. Factual errors degrade the effectiveness of the recorded data, the recorded information is internally inconsistent, or the record is not maintained current during the time frame/activity required.
11. **Personnel:** Failures related to the number, qualifications, or capabilities of staff performing planning, preparedness, readiness assurance, and response functions. Failures reflect lack of qualified staff to effectively carry out a function, or the assignment of personnel with inappropriate skills, training, or qualifications for the job.
12. **Equipment:** Failures related to the physical and other assets available to support the emergency management function: deficiencies or failures in dedicated response equipment, such as radios, radiation survey instruments, computers, protective equipment, or facilities from which to conduct emergency response activities.
13. **Backup (Alternate):** Failures related to the secondary or backup facilities, equipment, staff, or other resources/capabilities for response: lack of or inadequate backup for any key person, facility or resource; failure to adequately train backup personnel or to maintain the alternate response facilities in a usable state.

These generic faults should be clearly distinguished from **root causes**. The **root cause** is the basic reason for the criterion failure for which no underlying cause could be identified. The **root causes** generally reflect inadequate performance of *programmatic* activities, such as training or program administration, which maintain the program. In contrast, the generic fault is the further characterization of the observed failure; there will likely be a **root cause** for identified generic faults.

As a practical limit, the evaluator can assign up to three faults to each *finding*, as necessary. The assignment of multiple faults can represent situations, such as:

- Ambiguity or uncertainty in characterizing the failure
- Multiple generic faults are identified
- Primary and secondary (and maybe tertiary) generic fault(s) are identified

The selection of the appropriate fault(s) should not represent a major task. If the finding description or summary is written clearly and contains complete information for interpreting and characterizing the situation, selected faults(s) should be readily apparent and referred to within the finding description itself. For example, documents to be used for response are found to be old versions. The evaluator must distinguish between Implementation (#1) and Performance (#2). If an adequate document control system exists, and it is not followed, then Performance applies. On the other hand, if no system is in place, then Implementation is appropriate. The *finding* descriptions must certainly contain sufficient information to distinguish between the two possibilities, since different corrective actions may be required.

4.4.6 Program Readiness

An emergency management program consists of diverse activities, functions, and tools that operate either in a periodic, ongoing mode to ensure the readiness of the program to respond (through planning, preparedness, readiness assurance) or in a standby mode to respond to an emergency when called upon. A comprehensive estimate of overall program readiness to respond to an emergency cannot be obtained from a simple (linear) combination of evaluation results related to the individual program elements (e.g., average of all program element performance estimates). A true determination of the readiness of the overall emergency management program must account for the relationships between the *technical planning basis*, *programmatic* and *response* elements and on the relative contribution of each type to the estimate. Only by combining applicable *programmatic* element evaluations with *response* element evaluations can an estimate be obtained from **program evaluations** complementary to observed performance during an exercise. It is the method for combining/integrating *programmatic* and *response* element evaluation results that will determine the structure and methodology for obtaining overall readiness estimates.

Finally, until a practical framework for integrating the results within and between each type of evaluation is developed, program and exercise evaluations will necessarily represent standalone estimates of program *readiness*, each with its own attributes and limitations.

4.5 Evaluation Process

Evaluations of DOE/NNSA emergency management programs can be characterized by the organization that sponsors the evaluation and the relationship of the evaluators to the development and maintenance of the program. Evaluators who are neither responsible

for the development or maintenance of the program nor associated with the managing organization conduct an external evaluation. An internal evaluation or self-assessment is an evaluation sponsored by an organization to review and evaluate its own emergency program.

The process of evaluating emergency management in a *program* evaluation, either external evaluation or self-assessment, can involve examination, analysis, and evaluation in the following areas:

- Plans and procedures
- Administrative control mechanisms
- Planning basis and supporting analyses
- Response tools, such as computer models, monitoring equipment, communication systems
- Resources and resource availability
- Organizations and organizational interfaces
- Training and training validation
- Exercise program

Data sources include plans and procedures, other documents [e.g., EPHAs; Memoranda of Understanding (MOUs)], databases and records, limited scope tests/drills, and interviews. The more thoroughly these data sources are examined and analyzed, the more comprehensive is the evaluation.

An *exercise* evaluation, on the other hand, involves observation, analysis and evaluation of the demonstrated performance of integrated response capabilities during a simulated emergency event. Observations of activities included involve the ERO staff, utilization of facilities, equipment, and procedures. The scope of the evaluation, including the selection of the emergency management program elements to be observed, is determined by specific objectives developed for the particular exercise. Exercise evaluation also addresses the overall conduct and control of the exercise. This evaluation is based on exercise documentation, including the scenario and objectives, and the actual conduct of the exercise. Also included in the evaluation are the conduct of ancillary activities, such as controller and evaluator training, responder training, and the exercise critique. The validity of the exercise as a viable test of *readiness* should be a conclusion of this evaluation.

The process for conducting internal and external evaluations can differ substantially in areas such as scheduling, preparation, and interactions with the evaluated organization both during and after the evaluation. Since the process used for both types of evaluations

will be determined by the evaluating organizations, this guide does not address details related to organization-specific logistics and coordination issues. However, some common features of evaluations are discussed in the following sections, namely, data/information sources and the expected output from evaluations.

4.5.1 Data Sources

Successful evaluations depend on the availability of diverse sources of information. Choosing the appropriate sources will vary depending on whether the team is conducting a program or exercise evaluation. These sources can include document and records reviews, interviews, and observation of performance. [Some data sources for exercise evaluations (e.g., “hot wash,” post-exercise critiques) are discussed in Chapter 3.]

1. **Document Reviews.** Document reviews for program evaluations include: analyses such as Hazards Surveys, EPHAs, Safety Analysis Reports (SARs)/Safety Assessment Documents(SADs)/Documented Safety Analyses (DSAs), and Environmental Impact Statements (EISs); plans such as emergency plans, building plans, spill prevention plans, Resource Conservation and Recovery Act (RCRA) plans, and training plans; procedures such as administrative procedures for emergency management and Emergency Plan Implementing Procedures (EPIPs); and agreements, such as MOU and Memoranda of Agreement (MOA); and contracts. Additionally, evaluators should be knowledgeable of organizational structure, functional responsibilities, and previous evaluations.

An exercise evaluation requires a more limited facility/site or activity document review to provide the team with sufficient familiarity with the facility/site layout, activities, emergency management program plans and procedures, response capabilities, and hazards. A more extensive review effort is involved in an evaluation of the planning documentation associated with the exercise. The exercise package should contain sufficient information for the conduct, control, and evaluation of the exercise, including: exercise objectives, scope, participants, simulations, time lines, injects, technical data, safety/security provisions, controller instructions, and evaluation criteria.

2. **Records Reviews.** Records reviews during program evaluations could include the following:
 - Training records
 - Drill and exercise reports
 - Hazardous materials inventories
 - Corrective action tracking
 - Facility and equipment inventories
 - Systems tests such as notification, alerting, monitoring and communications tests
 - Incident and event reports

Data and records review following exercise evaluations can also provide supplementary supporting information necessary to address exercise findings, so that an implicit recommendation can be included in the write-up.

3. **Interviews.** Interviews during program evaluations should be conducted after the initial document review, when the program functions have been identified. Interviewees should include the managers of the emergency management staff, the emergency management staff itself, the ERO (including back shift personnel), support organizations such as training, industrial hygiene, health physics, operations and maintenance, and offsite interface organization representatives.

Evaluators should conduct interviews with a variety of individuals with different backgrounds and at different levels in the organization. Team members should talk to operators, mechanics, and all levels of supervision as necessary to get a thorough picture.

Interviews can elicit meaningful information concerning:

- Personnel qualifications, training and drill participation
- Familiarity with procedures and equipment
- ERO activation
- Problems encountered during response
- Adequacy of procedures and resources

Careful planning and conduct of the following steps in advance of each interview will enhance their effectiveness:

- Delineate the topics to be discussed
- Identify the types of questions to be asked
- Determine what reference materials should be available for the interview
- Identify the best location to hold the interview; if possible, perform the interview in the interviewee's workplace so that the resources needed will be readily available
- Anticipate the interviewees' perspective, possible concerns, and expectations
- Know the procedures and hazards that the interviewee should know and understand
- Determine how to establish a climate of trust and collaboration and, hence, how to avoid an adversarial encounter

- Facilitate the interview process to ensure that information needed is obtained and that the dialogue continues after the interview, as required
- Plan to follow through if information is promised for a later time
- Thank people for their time

The following techniques may facilitate the interview process:

- Setup the interview by introducing yourself, stating the purpose and context of the interview, outlining the topics to be covered, assuring confidentiality and establishing your credibility
- Ask open questions - why, when, how, who, where, and what
- Ask hypothetical questions
- Observe and listen closely to the person being interviewed
- Show interest and respect and don't be critical
- Restate the question and answer to ensure understanding;
- Inform interviewees that notes will be taken of topics discussed
- Verify and evaluate all information by requesting demonstrations of procedures or equipment, soliciting identical information from more than one person, and checking records to verify claims
- Include task performance testing of interviewees' ERO position with hypothetical scenarios; validate hypothetical scenarios with knowledgeable trusted agent and request confidentiality of subject matter until evaluation is complete
- Separate levels of supervision when interviewing; do not have the interviewee's supervisor present during the interview
- Do not make recommendations initially; determine the facts first to ensure a clear understanding of the problem
- Ask for copies of documents shown or referenced by the interviewee
- Do not respond positively or negatively to answers given, through either comments or facial expressions; instead use clues to develop further questions
- Hold your opinion during the course of the interview and avoid arguing

For exercise evaluations, interviews are limited to before or after the exercise, for logistic information or follow-up questions. During exercises, team members should

refrain from interfacing with responders, since interrupting or prompting the responders can prevent their decisions or actions. Prior to exercises, team members may interview personnel to gain further knowledge and/or clarification of responder duties, procedures, and equipment capabilities. After the exercise, responders may need to be interviewed by evaluators to clarify their response activities and observed performance.

4. **Observations.** When possible, observations should be made during both program and exercise evaluations. Program evaluations may include observations during the following:
 - Individual skill/knowledge tests
 - Training sessions
 - Facility walk-downs
 - Scheduled drills

Exercise evaluations may include observations of the following:

- Responder briefings
- Controller, evaluator, and/or specialized training
- Application of response capabilities
- Control of the exercise
- Exercise hot-wash
- Exercise critiques

To maximize the effectiveness of data collection from observation of performance during an exercise, utilize the following practices:

- Review the applicable procedures to guide observations of the planned performance required of the personnel.
- Before the action begins, find a location where key actions and communications can be seen and heard.
- Record the time of each observation.
- Observe whether exercise players have been pre-positioned.
- Note any impediments encountered by the players while they are accomplishing their tasks.

- Note significant deviations from the exercise time line.
- Note controller/evaluator effectiveness.
- Observe and take note of key response activities, including: ERO notification and mobilization; procedure usage; facility and equipment availability and usage; instrument calibrations; communications; decision-making; notifications; record keeping; staffing of functions; support requests; briefings; and key scenario times

Additional opportunities for observation may include:

- Observations of backshift operations to ascertain staffing and resource availability, training and responsibilities of backshift personnel, and general capabilities when management is not generally available.
 - Facility walk-downs to ascertain emergency response facility characteristics (communications equipment, power supplies, workspace, references, computer systems, ingress-egress and habitability monitoring, etc. Walk-downs of hazard facilities are also useful to review and validate information on inventory, storage, barriers in relation to EPHAs and EAL procedures.
 - Demonstration drills may be requested in advance by evaluators to observe team performance and validate what actions are depicted in emergency response procedures.
 - Scheduled training may be observed to review the actual content of training and instructor capability.
 - Equipment demonstrations can provide evaluators observations of equipment storage, security, availability, operability, maintenance/ calibration, operational procedures, personnel knowledge and skills. Equipment observations may include: field monitoring equipment readiness and use, communications systems, hazardous release plume modeling and tracking systems, notification systems, meteorological equipment, decontamination equipment, medical emergency response equipment.
5. **Data Selection Techniques.** A common problem associated with evaluations is the normally limited time available for collecting, reviewing, and evaluating information. A number of data selection techniques can be employed to perform a reasonably comprehensive evaluation within the available time constraint. These selection techniques include: sampling and horizontal-to-vertical review.
- **Sampling.** The technique of data sampling is essential to maximizing the evaluation effectiveness within the time constraints and available resources. During a program evaluation, team members cannot examine all activities, operations, processes, documents, and records for assigned functional areas. A selected number of activities, processes, or operations should be chosen to

represent the whole. The selected examples should be chosen at random to avoid concentration on a particular group or time. Since accuracy increases with sample size, multiple examples for sampling should be examined, keeping within the time allotted, resources, and reasonableness. Random sampling may be used in any of the information collection activities mentioned earlier, for example:

- Training records
 - Procedures for review
 - ERO members to interview
 - Weekly communications checks
 - Exercise scenarios to review
 - Equipment maintenance records
- **Horizontal-to-Vertical Review.** The horizontal-to-vertical information review methodology provides a means for investigating a specific emergency management component or element in a logical and efficient manner, without delving into details unnecessarily.

The technique applies primarily to program evaluations and involves a step-by-step general review of materials related to an area or activity to be evaluated. It may begin with a general top-level review of an emergency management element. If a potential problem is discovered during the general review (horizontal), then the evaluator can refocus the review effort on the supporting details (vertical) in an attempt to arrive at the underlying problem. The technique is a way to cover major aspects of a program, and, on a selected basis, examine supporting details to uncover potential problems or to verify the status of an activity.

6. **Field Notes.** Field notes are a critical component of the evaluation process that provides the mechanism for documenting an observation or issue as soon as possible after it is made or identified. Documentation should contain sufficient detail to support later development of findings and verification of issues or concerns. These field observations should be recorded in an informal notebook.

Names and titles of DOE and contractor personnel interviewed, with times, dates and topics discussed should be included in the notes, as well as the observations made during a walk-down. Team member entries should organize information collected, formulate tentative findings, and reveal the nature of missing information needed to resolve outstanding issues. These serve as an excellent source of thoughts in the preparation of the draft report. Under normal conditions, field notes should not be released to facility personnel being evaluated. These notes are for the use of team members only, unless otherwise stipulated by the team leader. Additionally, during exercises, evaluators should keep a time line record, drill and exercise observations, and critique information.

7. **Limited Scope Tests and Evaluations.** LSPTs and tabletop drills are scenario-based discussions between evaluators and interviewees that can be an effective method of observing performance when there is no opportunity to observe a drill or exercise. A

pre-developed scenario is used as the basis for discussion of the interviewee's role, responsibilities, and interfaces within the context of the given emergency scenario. Several interviewees can be interviewed and evaluated simultaneously in a tabletop drill, while a LSPT generally involves one emergency response position.

These observation methods are opportunities to observe decision-making capabilities, use of procedures, and interactions among ERO positions. However, because of the complexity of the method, evaluators need to be very well prepared, knowledgeable, and experienced. Additionally, assistance will be needed from the organization being evaluated in preparing scenarios and providing a trusted agent to assist in setup and conduct of the observations.

Preparation of a brief, simple and realistic scenario and clear scenario objectives is necessary. The entire session/interview should be executable in about 45 to 60 minutes. Objectives and scenario details must be communicated clearly to avoid confusion. Clock time should be observed for time sensitive activities, such as event classification, notification, and protective action decision-making. Responders should be allowed to talk through their actions with minimal interference. Leading or coaching should only be permitted at a level commensurate with the procedures and personnel normally present to assist responders.

The evaluator should maintain a timeline when conducting these observations and document actions taken and decisions made based on the scenario. Procedures and job aids used for performance should be documented. Results should be compared against the established objectives for the session and strengths and weaknesses should be documented. Time should be allowed for clarification and constructive critique at the end.

4.5.2 Evaluation Results

Based on the analysis and evaluation of the information collected from the data sources reviewed, an evaluation should yield at least findings and corrective actions, as required by the observed or projected performance. Other judgments such as Improvement Items, Superior Performance, and Noteworthy Practices are optional. An AAR should be produced for all evaluations to provide supporting documentation for the evaluation activity and the resulting findings and program improvements.

Findings. An evaluation consists of a judgment of the adequacy of demonstrated or projected performance in specific functional areas and activities, developing specific *response* or *programmatic* products, and utilizing the appropriate equipment, facilities, and tools. This performance is compared with a single evaluation criterion or a selected subset of criteria to determine its adequacy. Findings are then used to express these judgments resulting from either program or exercise evaluations by identifying the inadequacies in demonstrated or projected performance and characterizing their significance. These finding categories are Deficiency and Weakness, in order of decreasing significance. Section 4.4 of DOE G 151.1-3 contains definitions of the two finding categories along with guidance for their use in program and exercise evaluations.

An essential aspect of evaluation results is a concise, clear, and complete description of each particular finding. This description must detail explicitly the situation, circumstances, and special considerations and constraints that are needed to characterize the finding and identify the specific underlying fault. In addition, the finding description should be sufficiently explicit so that a recommended solution, if determined by the evaluator, is clearly expressed and readily apparent in the finding text.

To ensure that the evaluation findings are accurate and consistent with the observations and perceptions of multiple evaluation teams, draft findings should be reviewed and validated by all team members in an open discussion in order to achieve consensus. Such a validation process should resolve any identified discrepancies. This process is an essential step in an evaluation process to be accomplished prior to the preparation of the report.

Improvement Items. During an evaluation, an evaluator may note situations where, while specific criteria are being met and the performance objective for a particular program element is being achieved, the performance of the evaluated organization could be improved or made more efficient if they were to adopt standard DOE or industry practices. While the evaluator will have discussed the specifics with representatives from the evaluated organization, these recommendations are included in the report (in an appendix is acceptable) in sufficient detail to allow interested parties and subsequent evaluators to understand the situation and justification. It is sometimes useful to prepare Improvement Items in formats similar to that used for findings, since management at the facility/site- or activity-level may choose to track subsequent actions with the Corrective Action Tracking Systems (CATS) used for findings.

Superior Performance. Superior Performance denotes observed site performance or documented practice that demonstrates/implies excellence in a specific aspect of an emergency management activity. They are not necessarily recommended for other DOE/NNSA sites across the complex. Examples of Superior Performance need not be developed for every facility/site or activity and, therefore, the absence of specific instances of Superior Performance does not reflect shortcomings on their part.

Noteworthy Practices. When an evaluated organization has demonstrated a superior and unique approach, technique, product, tool, etc., this may be documented as a Noteworthy Practice. Noteworthy Practices are actions worthy of being emulated by other DOE/NNSA facilities/sites or activities. They should be described in sufficient detail so that interested parties and subsequent reviewers can understand the justification for the designation and can modify the practice to suit their particular situation.

Corrective Actions. Evaluations and the resulting findings would be of no benefit to an emergency management program if identified problems were not addressed through corrective actions. The corrective action responding to each finding is developed by the evaluated organization. To ensure that the problems identified will be corrected in an effective and timely manner, the evaluated organization should produce the following:

- Clear statement of the finding

- Statement of the cause of the identified problem area
- Details of the actions needed to eliminate the cause
- Responsibility for corrective action
- Schedule for completion of corrective action

4.6 Self-Assessments

A *self-assessment* can be viewed as an evaluation (program or exercise) of an emergency management program performed and/or sponsored by the organization itself or by some level of the management of the organization responsible for evaluating the emergency management program. Any level of the DOE organizational structure can perform a self-assessment, including personnel who are:

- Involved in the emergency management program and *directly* responsible for activities or program components that they are assigned to evaluate
- Involved in the emergency management program, but *not directly* responsible for activities or program components that they are assigned to evaluate
- Within the sponsoring organization, but without a direct relationship to the emergency management activities (e.g., Quality Assurance Department)
- With no direct connection or relationship to the program or the sponsoring organization

Personnel performing self-assessments should be qualified and trained in audits or evaluations, and, if possible, should be at most indirectly associated with the specific activities or emergency management program components they evaluate. This is particularly important for an evaluation of analyses (e.g., EPHA) related to the program bases and analytical tools. While the author of such analyses can certainly verify the required contents and end results, an objective view by another analyst is the most efficient way to evaluate their validity. The author may be too close to the analysis to judge it objectively. This discussion is not intended to preclude an author evaluating his own work, but merely to point out possible limitations associated with that approach. In areas other than technical analyses, the evaluations conducted by directly involved personnel are more likely to yield objective evaluation results consistent with evaluations conducted by the other groups mentioned above.

Self-assessments of emergency management programs should be based on the standard performance evaluation criteria listed in Appendix D of DOE G 151.1-3. Self-assessments may also include compliance with external non-DOE codes and regulations and, similarly, with internal organizational requirements and commitments. The methodology associated with self-assessments is very similar to that applied for other

forms of evaluations. The data- and information-gathering and evaluation techniques will be substantially the same.

Self-assessments can contribute significantly to enhancing a program's effectiveness through:

- Verifying program status on a periodic basis, for the benefit of emergency management staff and management
- Identifying program and performance weaknesses and negative trends
- Providing program-specific budgetary/staffing planning basis
- Preparing for an evaluation by an external sponsor

Secondary benefits of self-assessments, especially those performed by members of the emergency management program themselves, include:

- Reinforcing confidence of staff/management in the ability of the emergency management program to respond
- Providing emergency management staff with the opportunity to view the integrated program

Using a consistent set of performance evaluation criteria, as given in Appendix D, and the same definitions for expressing the significance of findings will simplify the process of combining self-assessment results with the results of other evaluations. Placing self-assessments and external evaluation results on the same performance-based scale can accomplish the following:

- Validate self-assessment results and reinforce confidence in the process;
- Facilitate the identification of similar problems and possible solutions from across the DOE complex; and
- Track progress in improving and maintaining program readiness using all available performance evaluation data.

The internal program evaluation can be the primary focus, but not the only part of a self-assessment program. It provides the opportunity to examine the results of other assessment activities throughout the year. Internal evaluations should be planned and organized to include and focus on those areas that the organization most critically needs to test and evaluate each year. Emergency managers should consider the following in determining the scope and focus of self-assessments:

- Results of evaluations from the previous year

- Results of performance tests over the past year (exercises, drills, etc.)
- Results of response to actual events
- The scope of evaluations from the previous years, ensuring that areas that were not evaluated thoroughly receive greater scrutiny
- Progress in making corrective actions previously identified
- Weaknesses identified from other self-assessment activities
- Achievement of performance measures set for the organization's emergency management program
- Improvements that the organization is committed to making

As resources for external evaluation activities decrease, more emphasis will be placed on the use of *self-assessments* for assuring that the *readiness* of the emergency response capabilities is maintained at a satisfactory level. A reasonable and consistent approach for conducting these internal evaluations is to follow the guidance suggested for external evaluations using consistent evaluation criteria and the same definitions for severity of findings. This simplifies the process of combining the results of internal program evaluations with exercise results, and combining self-assessments with external evaluations.

Finally, Appendix E presents a discussion of a systematic approach that views *self-assessment* as a continuous monitoring and evaluation process. This approach provides the emergency management program with a flow of data over the course of a year by which program maintenance activities (i.e., programmatic activities) can be monitored for indications of potential performance lapses. This continuous process maintains the concepts of evaluation and improvement as a vital component of the emergency management program.

4.7 Post-Emergency Evaluation

A Post-Emergency Evaluation is a critique of response to an actual emergency event or condition at any DOE facility/site or activity. In addition to being required by DOE O 151.1C, it is required by DOE Order 5480.19 and 29 CFR 1910.120. Emergency management specialists should accompany the team assigned to critique the response to the event (e.g., a team conducting an accident investigation required by DOE O 225.1A; Type A or B Investigation). It is important to emphasize that as a member of an accident investigation team, the team leader has the responsibility to determine the procedures and protocols involved in the conduct of the investigation. Hence, as a member of the team, an emergency management specialist must follow the direction of the team leader.

This section is intended to give emergency management personnel some preliminary guidance on a general approach to the emergency management investigation related to a

response. The evaluation of the emergency response to an actual event should include the following steps:

Step 1. Collect and Review Data

- Collect and review shift logs
- List personnel on shift
- Review emergency communications in logbooks
- Review ERO notification and activation times
- Review sequence of response to emergency
- Review press releases
- Review recorded operating parameters of equipment

Step 2. Reconstruct sequence of events from data.

Step 3. Conduct interviews to validate/complete event/response description.

- Have two to three persons on the interview team representing operations and the safety organization
- Compare the interview sequence of events with logs to verify the sequence and clarify discrepancies
- Involve emergency response personnel as appropriate. Include offsite response personnel involved with the response.

Step 4. Several After-action, or follow-up, steps should be accomplished as follows:

- Draft a report on the reconstructed sequence of events. Identify report items by source of information (i.e., log, interview, work request, work permit, and inspection team observations.) Have emergency response personnel review the draft.
- Conduct a tabletop response. Conduct a team tabletop response to the event utilizing site procedures and recording the actions that should have been performed were the procedures followed. Compare against the reconstructed sequence of events.
- Analyze events, decisions, and response actions. Use the evaluation criteria given in Appendix D to focus the analyses of the response on the generic components of the emergency management elements. The results of the post-emergency analyses can be structured similarly and will be compatible with exercise evaluation results.

- Identify areas needing corrective action or improvement (i.e., findings). Emergency response findings and corrective actions should be identified. Implementing the corrective actions is the responsibility of the organization.

More detailed guidance for structuring an evaluation of an actual response to an accident is available elsewhere. This limited description is intended to support the assertion that such a post-emergency evaluation is similar to an exercise evaluation. Hence, the evaluation of exercises and, likewise, the response during an actual emergency should be based on the same evaluation criteria. However, during an actual emergency, objectives selected for evaluation will correspond to the response needs of the specific emergency, while, for an exercise, objectives will be selected to focus the exercise performance on specific aspects of the program to be tested.

4.8 Performance Indicators

As emphasized previously, neither a program evaluation nor an exercise evaluation provides a single, standalone measure of emergency management program *readiness*. A reliable and comprehensive estimate of the “readiness” of an emergency management program must be based on an integrated assessment of both quantitative programmatic data and subjective evaluations of the various functions, activities, products, analyses, “tools,” etc., that contribute to the implementation, maintenance, improvement, and execution of emergency response capabilities. For the estimate to be meaningful, the contributions must be reasonably comprehensive and reflect the emergency management program within a somewhat narrow time frame.

Realistically, however, the contributions to such a comprehensive assessment may take a number of years to accumulate and, as a result, could reflect data and evaluations from different stages of a program. This would be especially true for large sites with extensive programs, where substantial resources, planning effort, and time would be involved in acquiring the necessary data, resulting in a significant interval between valid estimates of readiness for the full program. To avoid such potential inconsistencies and delays in assessing and tracking program readiness, an approach using specific programmatic data and/or evaluation results in selected functional areas can provide timely performance indicators to reflect discrete aspects of program readiness over the broad scope of the program.

Performance indicators for emergency management will consist of a set of critical indicators or “vital signs” derived from programmatic data and/or evaluation results to track the *readiness* of the program. Similar to physiological “vital signs,” such as temperature, blood pressure, heart rate, glucose level, cholesterol levels, etc., used by physicians to track patient health, “critical” performance indicators can be developed to focus on specific aspects of selected emergency management activities to measure the “health” of the program. In the case of the physiological vital signs, each by itself provides only a single indication of a potential health threatening condition, which leads the physician to order further tests and procedures. Similarly, emergency management indicators only tell a part of the story and further investigation is required in order to determine if a problem actually exists and, if it does, to provide further diagnosis.

The discussions that follow address two performance indicators: performance metrics and performance measures. A performance metric is a single parameter that reflects performance in terms of its absolute value (e.g., percent ERO personnel trained). A performance *measure* reflects performance in terms of the value of a metric relative to a pre-assigned goal (e.g., percent ERO personnel trained relative to a goal of 90%). The performance *metric* is used to follow or trend a value that characterizes a given activity or function. A performance *metric* can be used when a performance goal is unavailable or not meaningful for use as the baseline for a performance *measure*. A practical means for selecting an acceptable and achievable goal for the performance *measure* is by tracking the values of a performance *metric* over time, and selecting a candidate value that approximates an acceptable goal. The goal can be modified as more performance data is collected over time.

Performance indicators are usually discussed in terms of deterministic processes that produce products or services with identifiable characteristics that meet the needs of the customer. Whether the product meets the specific requirements is either directly apparent or becomes apparent through deterministic testing. In contrast, the “products” of emergency management are not necessarily objects that can be directly observed and whose characteristics are readily apparent and well defined. Actual tests (i.e., actual emergencies, exercises) are not comprehensive, involve a snapshot of performance in response to a single event scenario, test only selected functions, and usually involve only one cadre of the ERO. Hence, the ongoing activities that maintain the program (i.e., *programmatic* activities) must also be evaluated to provide assurances that the program satisfies the comprehensive objectives associated with the range of hazards on the facility/site or associated with an activity and is maintained at a level of readiness to protect workers, the public, and the environment.

The remainder of this section focuses on the types and general characteristics of performance indicators and how they relate to emergency management. This is followed by a more detailed discussion of performance indicators specific to emergency management programs.

4.8.1 General Characteristics of Performance Indicators

This section reviews general characteristics of performance indicators as covered in literature focused on performance-based management of organizations that deliver products or services on a continuous basis [Cf. How to Measure Performance. A Handbook of Techniques and Tools, prepared by the TRADE Performance-Based Management Special Interest Group (PBM-SIG), October 1995]. This fundamental characteristic is in contrast to the standby nature of the response elements of an emergency management program. However, some general characteristics of performance indicators shared by continuous and stand-by systems are addressed in the following discussion.

Performance indicators reflect critical quantitative or qualitative performance characteristics of products, services, and processes. They represent a useful tool for

helping to understand, manage, and improve how organizations (including, processes, programs, etc.) perform. In general, performance indicators can reflect:

- How well the organization is doing
- If it is meeting its goals
- If customers are satisfied
- If processes are in statistical control
- If and where improvements are necessary

A logical selection of performance indicators can provide an organization with the information necessary to make intelligent decisions related to achieving the organization's mission and goals.

Most performance indicators can be grouped into one of six general categories of performance characteristics.

- **EFFECTIVENESS:** Process characteristic indicating the degree to which the process output (work product) conforms to requirements. [*Are we doing the right things?*]
- **EFFICIENCY:** Process characteristic indicating the degree to which the process produces the required output at a minimum resource cost. [*Are we doing things right?*]
- **TIMELINESS:** Measures whether a unit of work was done correctly and on time. Criteria must be established to define what constitutes timeliness for a given unit of work. Criteria are usually based on customer requirements.
- **QUALITY:** Degree to which a product or service meets customer requirements and expectations.
- **PRODUCTIVITY:** Value added by the process divided by the value of the labor and capital consumed.
- **SAFETY:** Measures the overall health of the organization and the working environment of its employees.

Emergency management performance indicators will generally reflect the first three performance characteristics: Effectiveness, Efficiency, and Timeliness. Quality may describe performance in specific functional areas of the emergency management program, such as training, offsite interfaces, or public information.

Performance indicators should reflect implementation characteristics such as the following:

- Use measurable data
- Are understandable, practical
- Allow uniform interpretation
- Are normalized for bench marking
- Apply broadly
- Provide basis for continual self-assessment
- Are compatible with existing sensors
- Are an agreed-upon basis for decision-making; are accepted and have owners
- Are precise in interpreting the results; reflects results, not activities used to produce results
- Relate directly to a performance goal

It should be noted that several of the characteristics listed above might not apply to performance indicators for some organizations or programs because of the uniqueness of their missions or the availability of data for constructing performance indicators. Specifically, some performance indicators for emergency management may not satisfy the first and the last two characteristics, if they are subjective evaluation results rather than measurable parameters or they reflect activities rather than results of activities, respectively. These deviations from the usual, expected characteristics of performance indicators result from the “standby” nature of emergency management programs and the inability to accurately test the response without an actual emergency. This forces the dependence on programmatic data and evaluation results, rather than actual emergency response, to estimate *readiness* to respond.

Performance indicators can also be characterized by *what is measured*. A process can be divided into four steps: input, activity, output, and outcome. The first three are measurable in a continuous process, and the fourth is sometimes measurable. This characterization leads to four categories of measurement data:

- **INPUT-Based:** *what* the process needs to perform
- **ACTIVITY-Based:** *what* is done with the input
- **OUTPUT-Based:** *what* the activity produces

- **OUTCOME-Based:** *what* is the ultimate use/benefit/impact of the output

Note that the data used in the performance indicator represents a graded scale from basic INPUT to a process, to the ACTIVITIES that use the INPUT, to the OUTPUT of the ACTIVITIES, and, finally, to the intended OUTCOME of delivering the OUTPUT to the customer. In other words, the data used in indicators can vary from the most basic, the INPUT, to the final result, the OUTCOME.

Emergency management performance indicators can be characterized by all of the data types given above. However, the last category is difficult to measure, since the emergency management program “performs” or exhibits its desired OUTCOME, protecting people, only in response to an actual emergency. The infrequency of emergencies necessarily limits the availability of OUTCOME indicator results for estimating program *readiness*.

This characterization of performance indicators, based on type of input data, implies that the more directly OUTCOME can be measured, the more reliably the indicator reflects program *readiness*. A performance indicator that uses program INPUT data (e.g., budget or staff) is a weaker indicator of program readiness than ACTIVITY (e.g., training) or OUTPUT (i.e., trained ERO personnel) performance indicators. INPUT-based indicators, although clearly important, contain little direct, useful information, by themselves, that will reflect how the program will ultimately perform. The INPUT-based indicators are the most basic/primitive. Hence, as the data used in the indicators varies from INPUT, to ACTIVITY, and to OUTPUT data, the more accurately the indicator approaches a measure of readiness to achieve the desired OUTCOME of emergency response.

Performance indicators can also reflect the evolution of an organization or program. A different set of performance indicators might reflect performance for each phase in its development (e.g., concept development, design, implementation, start-up, testing, steady-state maintenance, etc.) In addition, performance indicators may also provide indicators of program status or actual or predicted performance in different time frames, within a given phase of the organization or program, for example:

- *Trailing* Indicators - Measure past performance
- *Current* Indicators - Measure current status
- *Leading* Indicators - Forecast future performance.

4.8.2 Emergency Management Performance Indicators

Performance indicators for an emergency management program can be grouped into three categories: **PROGRAMMATIC**, **RESPONSE**, and **ORGANIZATIONAL**. The first two categories reflect the functions and activities associated with the elements of an emergency management program. The third includes “organizational” factors that may influence or reflect the overall performance of the program as a whole.

PROGRAMMATIC indicators are associated with the *programmatic* emergency management elements and associated functions and activities listed in Section 4.4. These indicators will reflect program status and “ongoing” preparedness activities. Most of the PROGRAMMATIC indicators will be quantitative parameters that will characterize the current status of the program (e.g., plans, procedures, analyses completed or reviewed, corrective actions implemented) and accomplishments of preparedness activities (e.g., ERO personnel trained, drills held to reinforce training, individual skill tests performed, exercises conducted.)

RESPONSE indicators reflect the activities or functions associated with the *response* emergency management elements. In contrast to the quantitative PROGRAMMATIC indicators, the majority of RESPONSE indicators are based on subjective assessments of specific response activities or functions by expert evaluators observing “simulated” performance during exercises or making assessments of “projected” performance through evaluations of plans and procedures. RESPONSE indicators can be either a qualitative assessment or evaluation of a single activity or function, or a quantitative roll-up of individual qualitative assessments of multiple activities or functions.

ORGANIZATIONAL indicators will reflect factors influencing overall “organizational” behavior (e.g., management commitment and participation, management decision making, allocation of resources, organizational culture, communication within the organization) that might influence the performance of the various functions and activities associated with the emergency management program. These measures may be considered indicators of systemic “organizational” influences that could affect the *readiness* of an organization in various emergency management functional areas.

Next, as noted above, performance indicators can be characterized by “What is measured.” The following types of indicators reflect the general spectrum of available measurement data: **INPUT-Based**, **ACTIVITY-Based**, **OUTPUT-Based**, and **OUTCOME-Based**. An example from an emergency management program is given below:

TRAINING and DRILLS

INPUT-Based - *Training requirements (Positions, qualification criteria, personnel assignments, course content, trainer qualifications . . .)*

ACTIVITY-Based - *Conduct training sessions (Number of sessions, hours, personnel, training aids, drill requirements . . .)*

OUTPUT-Based - *Successfully trained for specific activity (Written tests, individual performance tests, or exercise results indicate success)*

OUTCOME-Based - *Personnel successfully execute the activity for which they are trained (Successful outcome based on performance during an actual event.)*

The spectrum of data, represented by INPUT-based through OUTPUT-based, represents a graded scale covering data which only *remotely* reflects the performance of the program (i.e., INPUT) through data that directly measures the success of the program (i.e., OUTCOME) in accomplishing its mission.

Data can also be collected that reflects performance of a program during the current time frame versus anticipated performance in a future time frame. A DOE emergency management program can be viewed as having at least two phases:

1. Development, including planning and initial implementation
2. Maintenance, review, and improvement (or “steady-state”)

Performance indicators selected to assess and track *readiness* vary depending on the phase of the program. For example, during the development phase, an indicator might include “completion of plans and procedures.” In the maintenance phase, the indicator might transition to “periodic review of plans and procedures.” For mature systems (i.e., in maintenance phase), the *readiness* evaluation component based on program evaluations defaults to quantitative programmatic data alone, since reviews of the plans and procedures themselves will ultimately reach a limit in effectiveness for identifying performance problems. As a result, exercise evaluations will become the primary means for tracking *readiness* during the maintenance phase of an emergency management program.

Performance indicators may also reflect program status or the actual or projected performance in different time frames, within a given phase of the program. An example of a **trailing** indicator might be the number of findings associated with program and exercise evaluations for the past year. A **leading** indicator that could predict future performance is the percentage of required Corrective Actions closed or resolved during the past year. A **current** indicator might represent the percentage of required Hazards Survey/EPHA completed at the end of a reporting period associated with Phase I, for example.

Finally, performance indicators can be quantitative, qualitative, or a combination of quantitative and qualitative parameters. A *quantitative* indicator can be represented by the absolute value of a numerical parameter or its value relative to a goal. A *qualitative* indicator derives from a subjective evaluation of a programmatic or response activity or function, with the resulting indicator having one of two answers, “Pass/Fail” or, equivalently, “Yes/No.” An **Ordered Scale** can also be used with either a quantitative parameter or a quantitative roll-up of individual qualitative assessments. An Ordered Scale provides a naturally ordered and labeled set of relative “grades” by which to express a judgment (i.e., evaluation) that becomes a performance indicator. Examples of Ordered Scales include:

1. A, B, C, D, and F
2. EXCELLENT, VERY GOOD, GOOD, POOR, and INADEQUATE

3. GOOD, ADEQUATE, MARGINAL, and POOR
4. BEST INDUSTRY PRACTICE, EFFECTIVE PERFORMANCE, IMPROVEMENT NEEDED, and SIGNIFICANT WEAKNESS

A combination of quantitative and qualitative characteristics can be subjective and produce data in categories that are naturally ordered. A combined indicator can use subjective evaluation results, in terms of a roll-up (i.e., weighted or unweighted addition) of numbers of criteria satisfied (or failed) for a given function or activity within a *programmatic* or *response* element; for example, an evaluation judgment expressed in terms of an Ordered Scale or a “Pass/Fail” criteria.

The source of most quantitative performance indicators will be programmatic data and preparedness activity measures, such as percentage of plans/procedures completed or percentage of ERO trained, respectively. Note that the goal for the first is 100%. However, the training goal may be a site-specific percentage that can only be obtained through experience in testing and evaluating the program. There are also some quantitative indicators that could be indicative of performance during the emergency “response”, but there are not many. Task duration (i.e., promptness) is the primary measure that may be derived from an exercise. Others, such as the percentage of total ERO successfully activated by the first call-out, might also reflect performance using site plans and procedures as the standard.

Emergency management performance indicators resulting from evaluations may not conform strictly to the definitions found in the standard performance measurement literature. These indicators may involve a subjective, qualitative judgment of failure or adequacy or a quantity that reflects failure or adequacy, such as, the number of formal findings or evaluation criteria satisfied for a specific program element. Qualitative performance indicators can also reflect **systemic failure across program elements**, by collecting findings or criteria to reflect performance indicators such as “decision-making,” “communication,” “planning basis,” “performance,” “control,” etc. Emergency management fault modes for evaluation criteria were given in Section 4.4.5.

The general development of performance indicators and how to use these to measure progress or success are given in DOE G 120.1-5, *Guidelines for Performance Measurement*.

Practical examples of performance indicators that are specific to emergency planning and preparedness (i.e., *programmatic* performance indicators), include:

- Completing ERO training when it is due/scheduled
- Maintaining a schedule for regular ERO equipment surveillance and maintenance
- Completing a given percentage of procedure reviews each year

- Meeting goals for drilling the organization with hazards survey/assessment scenarios that have not been addressed for some time
- Contacting a target number of news media organizations each year with information on the emergency response program
- Maintaining a schedule of contacts with mutual aid organizations
- Internal evaluation effectiveness – number of findings not self-identified

Examples of performance indicators that can be used by facilities and sites to help monitor emergency response (i.e., *response* performance indicators) capability from exercises and drills:

- Achievement of facility accountability within required timeframe
- Ability to release approved emergency information to media in a timely manner
- HAZMAT team response time
- Correct event categorization/classification decision making
- Availability of prompt notification system

Performance indicators for emergency management can include factors that reflect management commitment (i.e., *organizational* performance indicators) to the emergency management program. Examples include:

- Management participation in ERO
- Allocation of resources for the program
- Participation in review meetings
- CAP approvals
- Communication within the emergency management organization
- Management involvement in program assessment activities

4.8.3 DOE/NNSA Framework and Performance Indicators

Performance indicators for emergency management provide the means for each tier of the DOE/NNSA management system and the Office of Emergency Operations to track areas of critical importance to the mission of emergency management throughout the DOE/NNSA complex. At each tier of the DOE/NNSA system, indicators can be defined that measure performance in establishing and maintaining emergency management

capabilities commensurate with their responsibilities for planning, preparedness, readiness assurance, and response.

Responsibilities of the levels of management in the DOE/NNSA hierarchy that have not been addressed are the **oversight responsibilities** with respect to facilities/sites or field elements below them in the organizational structure. Performance indicators can provide a mechanism for tracking emergency management programs at multiple facilities/sites within the responsibility of each DOE/NNSA Cognizant Field Element or Headquarters organization. Most critical performance indicators can be “rolled-up” or aggregated to express a summary of performance for all applicable facilities/sites and activities. For example, a performance measure, such as percentage of ERO trained, has a goal for a specific facility/site of XX%. At the next level up in the DOE hierarchy, the performance indicator could be expressed as percentage of facilities/sites that have met or exceeded their specific ERO training goals. Similarly, performance indicators that reflect performance of the DOE/NNSA field elements can also be rolled-up for tracking at the headquarters level. Roll-up techniques can also be applied to qualitative PROGRAMMATIC, RESPONSE, and ORGANIZATIONAL performance indicators.

APPENDIX C. Emergency Readiness Assurance Plans

This appendix provides an acceptable template of format and content for Emergency Readiness Assurance Plans (ERAPs) for reporting the status of Emergency Management Programs for DOE/NNSA sites and activities. Unless otherwise indicated, the following ERAP sections apply to both Operational Emergency Base Program Facilities and Operational Emergency Hazardous Material Programs. Example information used in the tables to clarify expected entries is given in *italics*.

EMERGENCY READINESS ASSURANCE PLANS - FY 20XX

1. **Program Description:** Provide a brief summary statement of the overall status (e.g., mature, evolving) and level of readiness (commendable/acceptable/marginal) of the emergency management program.
 - A. Based on the results of the Hazards Surveys/Emergency Planning Hazards Assessments (EPHAs), briefly describe the rationale for determining whether the site consists of Base Program Facilities only or requires a Hazardous Material Program.

Briefly, discuss the status of your Hazards Surveys. If a survey has not been completed, provide information on completing the surveys, as outlined in **Table C-1**.

Table C-1. Hazards Survey Status

<i>Building/Facility</i>	<i>Planned Completion Date</i>	<i>Actual Completion Date</i>	<i>EPHA Required</i>	<i>Update (when hazards change or 3 years)</i>
Bldg. XYZ	10/28/05	10/25/05	Yes	10/28/06
N-Area	5/31/06	6/12/06	No	5/31/09
Solid Waste Disposal Facility	06/07/06	06/05/06	Yes	06/05/09
Laboratory 9999	1/31/06	2/12/06	Yes	1/31/07
PQR Facility	09/30/06	Survey delayed due to change in facility operation	Unknown	TBD

Briefly, describe the generic types of Operational Emergencies (OEs) (from your Hazards Survey) that could affect your site, facility, or operation.

If Hazards Surveys indicate EPHAs are required, discuss briefly the status of your EPHAs. Provide the status of all EPHAs (complete/ incomplete) across the site using **Table C-2**.

Table C-2. EPHA Status

<i>Building/Facility</i>	<i>Planned Completion Date</i>	<i>Completion Date</i>	<i>Hazardous Material Program Required</i>	<i>Update (when hazards change or 3 years)</i>
Bldg. XYZ	3/25/06	02/28/06	Yes	02/28/07
Laboratory 9999	05/31/06	05/30/06	Yes	05/30/07
Solid Waste Disposal Facility	09/015/06	09/12/06	No	09/12/09

If a Hazards Material Program is required, identify the dominant hazards on the site in terms of the most severe consequences (i.e., General Emergency (GE), site Area Emergency (SAE), or Alert; biological release OEs) from potential OEs using the table format below. The table should contain the majority of the most severe potential hazardous material releases.

Table C-3. Dominant Potential OEs

<i>Facility</i>	<i>Emergency Classification</i>			<i>Radioactive/Chemical/Biological Material</i>
	<i>GE</i>	<i>SAE</i>	<i>A</i>	
Building XYZ	X	X		Chemical - Arsine Radionuclide - Plutonium
Laboratory 9999				Biological Material (OE only)

- B. In narrative format, provide the status of your emergency plan and implementing procedures (date of last review, and if appropriate, date of revision).
- C. **Exemptions:** List any exemptions that have been requested, and the associated rationale for exemption. If none have been requested, provide the statement “no exemptions requested.”

Table C-4. Exemptions

<i>Exemption</i>	<i>Reason</i>	<i>Date of Submission</i>	<i>Approval Date</i>	<i>Duration</i>
Change time for notification to state and local agencies	Consistency with approved MOU	6/1/03	1/28/04	Review annually

2. **Program Application:** This section of the ERAP describes how provisions of the readiness assurance program, outlined in the emergency plan, have been applied in the past fiscal year and provides a forward look at what changes in focus will be applied in the future to assure continuous improvement. In narrative format, discuss:
- A. What weaknesses in the program are being revealed through self-assessment, evaluations, exercises, and training and drills?

- B. Are there differences between weaknesses found during self-assessment activities and those found by external oversight organizations? How are these differences explained or reconciled?
- C. How are weaknesses revealed in the past year to be addressed? What progress has been made in implementing corrective actions? Have corrective actions been effective in resolving the original weakness?

Table C-5. Program Weaknesses

<i>Evaluation Method</i>	<i>Conducting Organization</i>	<i>Identified Weakness</i>	<i>Facility specific or Site Wide</i>	<i>Date of Evaluation</i>	<i>Corrective Action(s)</i>	<i>Corrective action Status</i>
Annual Exercise	HS-63	Site EOC did not notify HQ Watch Office of the event and initial classification.	Site	11/02/05	Revise Job Aids, Revise training and Retrain EOC members	Completed all items 06/25/06
Annual Exercise	HS-63	None of the Bldg. XYZ, personnel knew where their evacuation rally points were located; accountability took 60 minutes.	Facility	11/02/05	Re-mark rally points, Revise facility job aid, Conduct refresher training, Conduct evacuation exercise to validate.	Completed all items 09/15/06
Self-Assessment	Internal	MOU(s)/MOA(s) with offsite agencies out of date	Site	01/28/06	Update all MOU(s) and MOA(s)	In progress, 90% completed
Self-Assessment	Internal	EPHA(s) does not provide full technical basis for source terms	Site and affected Facilities	01/28/06	Revise EPHAs to provide basis for source terms	In progress, 50% completed
No Notice Exercise	NA-40	EOC could not provide consequence assessments to offsite agencies for two hours after event classification.	Site and affected Facilities	06/18/06	Revise procedure Retrain on-duty EOC personnel. Conduct drills Conduct evacuation exercise to validate.	In progress; 70% completed

Following the format in Table C-5, provide outstanding evaluation/assessment findings (issues) identified by **external** sources (i.e., HS-63). This applies to findings reported in the Departmental Corrective Action Tracking System (CATS) only:

Table C-6. Status of Findings/Corrective Actions (as reported in CATS)

<i>CAP Finding/Issue No. (identify number of corrective actions for each issue in parentheses)</i>	<i>Due Date</i>	<i>Status</i>	<i>Projected Completion</i>
NTS-06/28/1999-I0001 (24)	07/30/05	On schedule	07/30/05

- D. What lessons are being drawn from operating experience of other DOE facilities/sites, as well as from related industries?
- E. Where does the facility/site have resource or other constraints that affect the process of continuous improvement of the program? What is the effect of the constraints?
3. **Program Achievements:** For the fiscal year just completed, following the format in **Table C-7**, compare actual achievements accomplished to projected goals, milestones, and objectives. Progress in meeting assigned program performance metrics should be reported here also.

Table C-7. Emergency Management Program Achievements: Goals, Milestones, Objectives, and Status

<i>Goal</i>	<i>Milestones</i>	<i>Objective</i>	<i>Status</i>
Conduct Annual Exercise	Exercise Plan Approval – 02/25/06 Rehearsal Drill – 04/25/06 Exercise – 05/25/06	Successful accomplishment of exercise objectives.	Exercise conducted 05/25/06; 2 deficiencies and 3 areas needing improvement identified
Conduct annual review or revision of all facility EPHAs	Bldg. XYZ: 02/28/06 Laboratory 9999: 05/30/06 Solid Waste Disposal Facility: 09/12/06	All EPHAs revised or reviewed by end of FY06	All facilities have completed required EPHA revisions/reviews by FY06.
Conduct Annual Training of ERO	Classes conducted each quarter	All personnel assigned to Site and Facility complete annual training (initial or refresher)	Completed 09/15/06
Conduct initial planning for FY07 Full Participation Exercise	Develop initial set of objectives 06/25/06 Conduct meeting with State Emergency Management and Public Health Dept. on exercise scope and objectives 07/15/06 Conduct meeting with County Emergency Management and Public Health Dept. on exercise scope and objectives 08/10/06 Submit revised objectives to State and County agencies for concurrence 09/22/06	Develop objectives for FY07 Full Participation Exercise Get concurrence on exercise from State Emergency Management and Public Health Dept. Get concurrence on exercise from County Emergency Management and Public Health Dept.	Offsite agencies concurred on final set of objectives on 09/27/06

4. **Program Goals:** For the new fiscal year, describe projected goals, milestones, and objectives following the format shown in Table C-8.

Table C-8. Emergency Management Program Projections: Goals, Milestones, Objectives

<i>Goal</i>	<i>Milestones</i>	<i>Objective</i>
Conduct Annual FY07 Full Participation Exercise	Exercise Plan Approval – 03/01/07 Rehearsal Drill – 04/25/07 Exercise – 05/25/07	Successful accomplishment of exercise objectives.
Conduct Hazards Survey	PQR Facility: 4/20/07	Complete Hazards Survey
Conduct an review of process changes that require a review or revision of facility EPHAs	Bldg. XYZ: 03/07/07 Laboratory 9999: 05/30/07 Solid Waste Disposal Facility: 09/12/07	EPHAs revised or reviewed as needed by end of FY07
Conduct Annual Training of ERO	Classes conducted each quarter	All personnel assigned to Site and Facility complete annual training (initial or refresher)
Conduct initial planning for FY 08 Annual Exercise	Develop initial set of objectives 06/25/07 Conduct meeting with exercise participants on exercise scope and objectives 07/15/07 Submit revised objectives to participants for concurrence 09/22/07	Develop objectives for FY08 Annual Exercise Obtain concurrence on exercise scope and objectives from participants. 10/03/2007 Conduct Final Planning Conference. 10/15/07

5. **Other:** Briefly discuss concerns pertinent to the emergency readiness assurance program. Specifically, this section addresses issues unique to the facility/site that should be brought to the attention of senior management (i.e., concerns with state and local agencies, funding, resources, etc.). Include suggestions or methods to resolve these issues.

Resource requirements should include resources necessary to administer and operate the emergency management program. Be sure to include resources necessary for conduct of self-assessments and emergency exercises, resources needed to make corrective actions, improve on weaknesses, and implement lessons learned. Changes in regulatory and statutory requirements associated with emergency management should also be considered when determining required resources associated with program changes.

- A. Provide the total number of full-time/part-time site/facility personnel required for the current and next fiscal years in **Table C-9** by Federal and contractor staff. Describe the composition (i.e., types of personnel) included in the totals for each category. In narrative format, provide justification for changes in staffing levels.

**Table C-9. Emergency Management Personnel -
Full Time Equivalents**

<i>Organization</i>	<i>FY06</i>	<i>FY07</i>
Federal	2.5	2
Contractors	15	15
Justification:		

- B. In **Table C-10**, summarize the Emergency Management Program operational budget. Describe the general types of costs in each category. In narrative format, provide justification to support additional funding requirements.

Table C-10. Emergency Management Operational Budget

<i>Organization</i>	<i>FY06</i>	<i>FY07</i>
Federal	\$700K	\$1,005K
Contractors	\$2,200K	\$3,000K
Justification:		

- C. If equipment requirements are not included in the Operational Budget, provide budget estimates for equipment in **Table C-11**. This list includes necessities such as EOC equipment, field monitoring equipment, and Radiological Assistance Program (RAP) Team equipment:

Table C-11. Equipment Requirements

<i>Item</i>	<i>FY06</i>	<i>FY07</i>
Plotter Printer	\$50K	
Replace TV Monitors in the EOC		\$6K
Replace 2 radiological field monitoring instrument sets		\$30K
Justification:		

APPENDIX D. Evaluation Criteria

D.1 Introduction

This appendix provides a standard set of generic performance-based criteria to be used for the evaluation of the planning, implementation, maintenance, and response of emergency management programs across the DOE/NNSA complex. These evaluation criteria were developed to provide a comprehensive set of criteria applicable to the diversity of DOE/NNSA facilities/sites and activities based on meeting the performance goal(s) specified for each program element. Performance goals (or standards) were developed from DOE O 151.1C, *Comprehensive Emergency Management System*.

Differences in hazards will dictate how facilities/sites and activities approach program planning, implementation, maintenance, and response. Hence, evaluations of such programs should be conducted in a manner commensurate with hazards and missions. Criteria presented here are intentionally generic and were developed to reflect the actual or expected general performance of the emergency management element and not the specific details of plans/procedures, “tools”, organizational structure, products, resources, training, etc.

Criteria should **NOT** be used during an **exercise evaluation** *as given*. Program-specific expectations and characteristics should be developed for each emergency management program based on facility/site- or activity-specific hazards and associated program capabilities (e.g., derived from existing plans and procedures). From these attributes, generic criteria can be restated in the context of the specific program. This facilitates the evaluator’s task by bounding the general intent and scope of the function or activity, as expressed in the generic criteria, and focusing on the key program-specific attributes incorporated in the revised criteria. In contrast, during a **program evaluation**, generic criteria for programmatic and response elements are used as the standard, against which plans and procedures, and preparedness activities are judged in the context of facility/site- or activity-specific hazards, associated program capabilities, and the “commensurate with hazards” approach.

For example, a criterion that addresses “sufficient” staffing of Emergency Response Organization (ERO) positions is stated generally to cover a site with a 5 member ERO as well as a site with 100 members. An actual quantitative “sufficient” staffing requirement is program-specific. The standard set of criteria can be interpreted in the context of a particular program or activity, or a specific scenario during an exercise, in a number of ways, including the elimination of inapplicable criteria and the development of program-specific criteria from the generic criteria given in this chapter. Any modifications or additions to the set of generic criteria contained herein should be documented and well understood by all evaluating elements prior to conduct of the evaluation.

Fifteen broad sets of criteria are grouped according to Program Element in Sections D.2, D.3, and D.4 of this appendix. Each program element section includes the performance

goal of the element and a set of evaluation criteria, separated according to *response* or *programmatic* subelements, as appropriate. The set of criteria are labeled to identify applicable evaluation types:

- **P** for program evaluation only,
- **E** for exercise evaluation only,
- **P/E** for both program and exercise evaluations; and
- **CE** for evaluation of the *conduct* of an exercise.

Numbered criteria, for example, P2.1, P/E6.42, P/E12.2, and P/E14.12, represent critical criteria necessary to ensure that the performance goal for each element is satisfied. Subcriteria labeled as a, b, c . . . represent performance that supports the numbered criteria and emphasize a distinguishable function, component, or activity that merits special attention. Subcriteria do not necessarily represent or define the total performance expectations of the criterion; they help *refine* the interpretation of performance failures and specific Findings. CE criteria given in Section D.3.3 for the Exercise program element are used for evaluating planning, control, conduct, and evaluation of an exercise.

As indicated in DOE G 151.1-3, Section 4.4, several **Response** elements have programmatic functions, in addition to their primary response functions. These are given at the end of the lists of response function criteria.

D.2 Technical Planning Basis

Performance Goal:

The Hazards Survey is an examination of the features and characteristics of the facility/site or activity that identifies the generic types of emergency events and conditions and the potential impacts of such emergencies to be addressed by the DOE Comprehensive Emergency Management System. The Hazards Survey identifies key components of the Operational Emergency Base Program that provide a foundation of basic emergency management requirements and an integrated framework for response to serious events involving health and safety, the environment, safeguards, and security. For facilities/sites and activities involved in producing, processing, handling, storing, or transporting hazardous materials that have the potential to pose a serious threat to workers, the public, or the environment, the Hazards Survey provides a hazards screening process for determining whether further analysis of the hazardous materials in an Emergency Planning Hazards Assessment (EPHA) is required.

An EPHA is performed for each facility/site or activity involving at least one candidate hazardous material, as identified through the hazardous material screening process and indicated in the Hazards Survey. EPHAs involve the application of rigorous hazards analysis techniques that provide sufficient detail to assess a broad spectrum of postulated Operational Emergency (OE) events or conditions involving the potential onsite release

of (or loss of control over) hazardous materials and to analyze the resulting consequences. Each EPHA reflects both the magnitude and the diversity of the hazards and the complexity of the processes and systems associated with the hazards, and provides the technical planning basis for determining the necessary plans/procedures, personnel, resources, equipment, and analyses (e.g., determination of an EPZ) for the Operational Emergency Hazardous Material Program.

Evaluation Criteria:

Hazards Survey

- P1.1 The Hazards Survey identifies the generic types of serious emergency events or conditions to which the specific facility/site or activity may be exposed (e.g., fires; flood; tornadoes; earthquakes; hazardous material releases; regulated pollutant or oil spills; safeguards and security events; work place accidents; malevolent acts; mass casualties; wildland fires; nearby offsite non-DOE hazardous material accidents).
- P1.2 The Hazards Survey qualitatively identifies the potential impacts of different generic types of emergencies on health and safety, the environment, and national security.
- P1.3 The Hazards Survey identifies emergency management requirements that constitute the Operational Emergency Base Program:
 - a. DOE orders [other than DOE O 151.1C], other Federal agency, state, and local emergency planning and preparedness requirements associated with different generic types of emergency events or conditions and applicable to the facility/site or activity; and
 - b. Existing plans, such as earthquake self-help plans or mass casualty plans, detailing compliance with Federal, State, or local standards, are incorporated directly into the Operational Emergency Base Program or are invoked by reference.
- P1.4 Facilities/sites and activities that require a documented, quantitative EPHA are identified by a hazardous material screening process and are indicated in the Hazards Survey.
- P1.5 Hazards Surveys are reviewed and updated every three years to include changes in the hazards. If changes result in an increase in hazards, the Hazards Survey is updated immediately; otherwise, the Hazards Survey can be updated at the next scheduled review.

Hazardous Material Screening Process

- P1.6 A hazardous material screening process is developed and applied to facilities/sites and activities involved in producing, processing, handling,

storing, or transporting hazardous materials that have the potential to pose a serious threat to workers, the public, or the environment.

- P1.7 The screening process identifies candidate hazardous materials that, if released in an uncontrolled manner, would immediately threaten or endanger those who are in close proximity; have the potential for dispersal beyond the immediate vicinity in quantities that threaten onsite personnel or the public; and have a potential rate of dispersal to require a time-urgent response to implement protective actions for workers or the public. Protective Action Criteria (PACs) are used to indicate when the consequences of a release of a radioactive or chemical hazardous material threaten or endanger health and safety.
- P1.8 The hazardous material screening process identifies all hazardous materials in a facility/site or activity that require further analysis in an EPHA.
- P1.9 All radioactive materials in a facility/site or activity are subjected to a hazardous material screening process.
- P1.10 Radioactive materials excluded from further analysis in an EPHA include:
- a. Sealed radioactive sources that are engineered to pass the special form testing specified by the Department of Transportation (DOT) or the American National Standards Institute (ANSI);
 - b. Materials in solid form for which there is no plausible dispersal mechanism; materials stored in DOT Type B shipping containers with overpack, if the Certificates of Compliance are current and the materials stored are authorized by the Certificate; and
 - c. Materials used in exempt, commercially available products.
- P1.11 Radioactive hazardous materials that are analyzed in an EPHA include the radioactive materials listed in DOE-STD-1027-92 in quantities greater than the Category 3 values given in Attachment 1, Table A.1, of that Standard.
- P1.12 All chemicals in a facility/site or activity with known or suspected toxic properties are subjected to a hazardous material screening process.
- P1.13 Chemicals excluded from further analysis in an EPHA include:
- a. Materials used in the same form, quantity, and concentration as a product packaged for distribution and use by the general public;
 - b. Materials that have a Health Hazard rating of 0, 1 or 2 based on National Fire Protection Association (NFPA) 704; and

- c. Solid or liquid materials that because of their physical form or other factors (e.g., plausible dispersal mechanisms) do not present an airborne exposure hazard.
- P1.14 Quantities of chemical hazardous materials considered to be “easily and safely manipulated by one person” are determined in accordance with the provisions of 29 CFR 1910.1450(b).
- P1.15 Chemical hazardous materials in quantities greater than a quantity that can be “easily and safely manipulated by one person” that are analyzed in an EPHA include:
- a. Chemicals with an assigned Health Hazard rating of 3 or 4 based on NFPA 704; and
 - b. Chemicals without an assigned Health Hazard rating.
- P1.16 All biological hazardous materials in a facility/site or activity are subjected to a hazardous material screening process.
- P1.17 At a minimum, Federally regulated biological *Select Agents and Toxins*, identified in lists published in Department of Health and Human Services (HHS) regulations [42 CFR 73] and Department of Agriculture (USDA) regulations [7 CFR 331 and 9 CFR 121], require further analysis in an EPHA. Toxins listed in 42 CFR 73 and 9 CFR 121 must exceed the minimum quantities specified to be Federally regulated and require an EPHA.
- P1.18 If biological agents and toxins require further analysis in an EPHA, then a Hazardous Material Program is established.
- P1.19 The possibility that excluded materials could initiate, through fires, explosions, or process upsets, the release of other hazardous materials is considered. In addition, excluded asphyxiates are considered if they have the potential to affect collocated workers because of the large quantity, material characteristics, and favorable geography.
- P1.20 If the screening process identifies at least one hazardous material requiring further analysis, the Hazards Survey must indicate that an EPHA is needed for that facility/site or activity.
- P1.21 The Office of Secure Transportation (OST) develops an EPHA for OST shipments and establishes an Operational Emergency Hazardous Material Program.
- P1.22 An EPHA is developed for shipments that **do not** satisfy governing DOT regulations and specifications for commercial hazardous materials transport. No EPHA is required if the shipment satisfies these commercial transport regulations and specifications.

Emergency Planning Hazards Assessment (EPHA)

- P1.23 The EPHA describes the site and facility or activity, directly or by reference, including:
- a. Site location, facility description, operations, mission, processes, tenant activities, and facility locations (including proximity to adjacent facilities, site boundary, utility and transportation networks);
 - b. Transportation activities, including types and quantities of materials transported, containers, routes, speeds, and controls exercised; and
 - c. Characteristics of the region beyond the site boundary including summaries of demographics (including special populations), administrative boundaries, geographic features, and economic enterprises (e.g., farms, factories).
- P1.24 The EPHA contains a current, accurate compilation of hazardous material inventories or maximum quantities associated with a facility/site or activity based on reliable and comprehensive methods of hazardous material identification (e.g., walkthroughs, shipping records, local chemical inventory systems).
- P1.25 Analyzed hazardous materials are characterized in the EPHA:
- a. Storage location, process use, physical properties, and health effect parameters;
 - b. Engineered controls, administrative controls, storage segregation, safeguards and safety systems for prevention and/or mitigation of releases are identified; and
 - c. Actual barriers to release are identified, such as, containers, buildings, berms, sumps, catch basins, filters, and heating, ventilation and air conditioning (HVAC) systems.
- P1.26 A spectrum of potential emergency event/condition scenarios are postulated and realistically analyzed in the EPHA, including:
- a. Applicable initiating events (e.g., fire, explosion, natural phenomena, malevolent events, accidents, external events);
 - b. Contributing events, accident mechanisms, equipment or system failures, engineered safety system and control failures, source terms, material release chemistry and characteristics, environmental transport and diffusion, exposure considerations, and health effects;

- c. Range of event probabilities and consequences, from low probability, high consequence to high probability, low consequence, including Beyond-Design-Basis events;
 - d. Events exclusively affecting onsite personnel, as well as those affecting the offsite public; and
 - e. Potential malevolent acts applicable to the facility/site or activity based on Design Basis Threat (DBT) guidance, if available.
- P1.27 Emergency events or conditions are **NOT** excluded from analysis in the EPHA based solely on calculated occurrence probabilities or arbitrarily defined delimiters (e.g., credible or incredible, likely or unlikely).
- P1.28 Indicators of emergency event/condition scenarios that can be used for recognition purposes in developing Operational Emergency (OE) categorization criteria and Emergency Action Levels (EALs), as appropriate, are identified and documented in the EPHA.
- P1.29 Estimates of the consequences of hazardous material release scenarios (primarily radioactive and chemical) are calculated and documented in the EPHA:
- a. Receptor locations include facility and site boundaries, collocated facilities, and offsite locations, including special populations (e.g., schools, hospitals, and prisons).
 - b. Calculations are performed for the purposes of protective action determinations, response decision-making, and special planning, [e.g., Emergency Planning Zone (EPZ) determinations].
 - c. Methods and models used for calculating consequences are applicable to the releases analyzed; assumptions used are valid and documented.
- P1.30 Biological agent release scenarios are analyzed to obtain indicators for recognizing OE events/conditions and for initial protective actions. The analysis methodology is documented in the EPHA.
- P1.31 Classified material quantities and storage are analyzed and documented in a classified annex to the EPHA.

Maintenance of the EPHA

- P1.32 The EPHA is reviewed and updated every three years.
- P1.33 An accurate and timely method for tracking changes in operations processes, or accident analyses that involve hazardous materials (e.g., introduction of new materials, new uses, significant changes in inventories, modification of

material environments) is established and maintained for the facility/site or activity.

- P1.34 Management procedures are implemented to ensure that emergency planners are notified of significant changes in inventories, processes, or activities that may affect the results of the EPHA [e.g., active involvement of emergency management personnel in the Integrated Safety Management System (ISMS)].
- P1.35 Sufficient transition time is allowed for emergency management personnel to review the EPHA and modify plans or procedures, as necessary, to account for changes in the hazardous material situation.
- P1.36 Changes made in the facility/activity or activity safety analysis reports, probabilistic risk assessments, vulnerability assessments, fire hazard analyses, environmental impact statements, and other documents that address hazards or potential consequences are integrated with maintenance of the EPHA.
- P1.37 If changes result in an increase in hazardous material inventories or release potential, the EPHA is updated immediately; otherwise, the EPHA can be updated at the next scheduled review.
- P1.38 After a decontamination and decommission action is completed, the Operational Emergency Hazardous Material Program is adjusted to be commensurate with the hazards that remain.

Emergency Planning Zone (EPZ)

- P1.39 The size and shape of the EPZ is determined by the spectrum of scenarios, the consequences of the potential releases, health effect parameters, and geopolitical boundaries beyond the site boundary.
- P1.40 The EPZ is the area within which protective actions will most likely be taken to protect workers or the public from the effects of the majority of airborne hazardous material releases from the facility or site.
- P1.41 The EPZ defines an area within which protective actions will provide for substantial reduction in early lethality for all analyzed airborne hazardous material releases.
- P1.42 The EPZ is sufficiently large that the planning efforts within the defined EPZ provide a substantial basis for expansion of response activities beyond the EPZ, if warranted by actual conditions.
- P1.43 The maximum EPZ for any DOE or NNSA facility or site does not exceed a nominal radius of 10 miles (16 kilometers).
- P1.44 Biological hazardous material release scenarios are not used in determining the size of the EPZ.

D.3 Programmatic Elements

D.3.1 Program Administration

Performance Goal:

Effective organizational management and administrative control of the facility/site or activity emergency management program is provided by establishing and maintaining authorities and resources necessary to plan, develop, implement, and maintain a viable, integrated, and coordinated comprehensive emergency management program.

Evaluation Criteria:

Organizational Management and Administrative Control

- P2.1 An individual is designated to administer the facility/site or activity emergency management program with responsibility and authority to ensure:
- a. The development and maintenance of the Hazards Surveys and EPHAs, emergency plans and procedures, and related and supporting documentation;
 - b. The development of the annual Emergency Readiness Assurance Plan (ERAP);
 - c. The development and conduct of the training and exercise programs and the coordination of readiness assurance (evaluation, assessment) activities; and,
 - d. The coordination of emergency resources by identifying resource needs and ensuring the availability of adequate resources.
- P2.2 The designated administrator has the authority and resources, commensurate with assigned responsibilities, and has access to top-level management.
- P2.3 For biosafety facilities, the designated Responsible Official (RO) is responsible for implementing and maintaining the emergency management program. This designated administrator/official is responsible for tasks that involve compliance with the requirements for the Select Agent Rule(s) [i.e., HHS regulation 42 CFR 73 and USDA regulations 7 CFR 331 and 9 CFR 121] and with existing DOE/NNSA emergency management policy as expressed in DOE O 151.1C.
- P2.4 Administration of planning, preparedness, and readiness assurance activities is established and effectively maintained.
- P2.5 Formal review and approval processes are established and documented to ensure that the planning and development of components of the emergency

management program (e.g., planning analyses, plans and procedures, supporting documentation) receive sufficient oversight by staff, management and DOE elements to ensure consistency, correctness, and completeness.

- P2.6 Reasonable schedules (e.g., documentation submittals, reviews, and approvals; preparedness and readiness assurance activities) are established and enforced to ensure that program planning, preparedness, and readiness assurance activities are initiated, completed, and repeated in a timely and efficient manner.
- P2.7 An emergency management document control system is established that meets industry standards for document review, approval, distribution, and change control.
- P2.8 An auditable administrative program for ensuring the availability of vital records essential to the continued functioning or reconstitution of an organization during or after an emergency, regardless of media, is established and reliably maintained.
- P2.9 If classified information or materials are being used or generated, effective security procedures and controls are implemented, and security reviews are conducted.
- P2.10 Financial resource requirements are identified and budgeted.
- P2.11 Facilities and equipment requirements are identified, monitored, and acquired.
- P2.12 Personnel requirements are identified and addressed.

Specific Program Responsibilities

- P2.13 Emergency plans and procedures are developed, verified, validated, reviewed periodically and updated as necessary.
- P2.14 Emergency management programs and emergency plans are developed for facilities not requiring a Hazardous Material Program that address the minimum Base Program requirements.
- P2.15 Emergency management programs and emergency plans are developed for facilities requiring a Hazardous Material Program that are seamlessly integrated with Base Program requirements.
- P2.16 Facility emergency management programs on a site are consistent, and are integrated to ensure site-wide consistency.
- P2.17 A leased facility owned by DOE/NNSA effectively integrates the activities of the leased facility into the DOE/NNSA site-wide emergency management program.

- P2.18 Biosafety facility incident response plans are integrated with the site-wide emergency management program.
- P2.19 Training, drills, exercises, and evaluation activities are scheduled, conducted, monitored, and documented.
- P2.20 Development and approval of supporting documentation [e.g., Memoranda of Understanding (MOUs), Memoranda of Agreement (MOAs)] is accomplished; periodic reviews and maintenance are scheduled and conducted.
- P2.21 Emergency management documents are controlled, available, and current.
- P2.22 Correction of findings and incorporation of lessons-learned are tracked, addressed, verified and validated.
- a. Methods are in place and implemented to remain apprised of current events and lessons learned and to utilize this information for continuous improvement; and
 - b. A site-wide corrective action program is implemented and effective in correcting problems identified in the emergency management program.
- P2.23 Specific emergency management Order requirements related to administrative responsibilities and emergency management activity (i.e., planning, preparedness, readiness assurance) parameters/constraints are monitored for compliance.

Document Requirements

- P2.24 Current reviewed and approved Hazards Surveys and EPHAs are available and provide technical planning basis information for the development of the Operational Base Program and Operational Hazardous Material Program, commensurate with the hazards.
- P2.25 Emergency plans and procedures:
- a. An emergency plan documents the emergency management program, including provisions for response to an OE; Emergency Plan Implementing Procedures (EPIPs) describe how the emergency plan will be implemented;
 - b. Clearly state roles, responsibilities, and requirements associated with program administration, emergency response organizations, individual positions, operations, and interfaces; and
 - c. Describe the integration and coordination of the emergency management program with the DOE ISMS.

- P2.26 If a facility is generating classified information or Unclassified Controlled Nuclear Information (UCNI), all emergency management documents (e.g., plans and procedures, supporting program documentation, scenarios, and assessments) are reviewed by a Derivative Classifier (DC) or UCNI reviewing official.
- P2.27 Documented arrangements with leased facilities include:
- a. Description of how each of the lessee's emergency management program elements are integrated into the site-wide program; and
 - b. A requirement that the lessee's hazardous material inventories be reported to the site emergency management program annually; and
 - c. A requirement that the lessee must report significant changes to the facility or hazardous material inventories prior to implementing the changes.

D.3.2 Training and Drills

Performance Goal:

A comprehensive, coordinated, and documented program of training and drills is an integral part of the emergency management program to ensure that preparedness activities for developing and maintaining program-specific emergency response capabilities are accomplished.

Evaluation Criteria:

Training Program

- P3.1 A comprehensive and systematic training program plan for accomplishing emergency management training goals includes: training objectives, target audience, an outline and schedule of training, resources and facilities, organizational responsibilities, and training program administration.
- P3.2 The training program for all primary and alternate personnel assigned to the facility- and site-level ERO includes the following key provisions for position-specific requirements:
- a. Initial training and annual refresher training;
 - b. Refresher training when hazards or emergency plan/implementing procedures change; and
 - c. Demonstrations of proficiency through testing and drills.

- P3.3 The emergency management training program provides a current and structured view of program-specific training requirements:
- a. The training program is reviewed and updated periodically, or as required, based on changes in related emergency plans/procedures;
 - b. A detailed list of courses and drills provided by the emergency management program is developed and maintained; and
 - c. Matrices for the identification and implementation of required training topics versus ERO positions are developed and maintained.
- P3.4 Administrative program records provide the source for identifying qualified instructors, training material approval authority, and qualification signature authority.
- P3.5 The program plan defines minimum program standards for:
- a. Training required for each position (i.e., certain courses must be completed);
 - b. Proficiency (e.g., minimum grades on tests, how prior experience is credited);
 - c. Performance (i.e., acceptable performance during drills, exercises, or actual events); and
 - d. Retraining, and re-validation.
- P3.6 The emergency management training program is effectively integrated and coordinated with related training programs provided by other organizations.
- P3.7 Training courses are performance-based, customized to program-specific ERO positions, contain learning objectives, and have testing as a final validation of satisfactory completion.
- P3.8 Refresher training includes details of program changes and lessons-learned from actual events, exercises, DOE and industry operating experience, and program evaluations.
- P3.9 The training program requirements are in accordance with the National Response Plan (NRP) and National Incident Management System (NIMS).

Training Requirements - Onsite

- P3.10 Initial training and periodic drills are provided to all workers who may be required to take protective actions (e.g., shelter-in-place; assembly,

evacuation). This training is required when they are employed, when their expected protective actions change, or when the emergency plan changes.

- P3.11 Refresher training is provided annually to certified operators and supervisors, and those workers who are likely to witness a hazardous materials release and who are required to notify proper authorities of the release.
- P3.12 Both initial training and annual refresher training is provided for instruction and demonstration of proficiency by all personnel (i.e., primary and alternate) comprising the ERO for their assigned position or function.
- P3.13 Special team training is conducted for functional groups, in particular those with technical and management team assignments (e.g., consequence assessment).
- P3.14 To ensure that ERO decision makers are able to perform their duties promptly and accurately:
- a. Training emphasizes the need for prompt, accurate, and practical judgments involving event categorization and classification, protective actions, and the urgency of notifications of OEs;
 - b. EAL training is conducted periodically to improve the proficiency of ERO decision makers in timely and conservative classification of OEs, including decision-making when information is incomplete or uncertain and for events and conditions that are not covered explicitly by the EALs; and
 - c. ERO personnel authorized for initial classification and protective action decision-making validate their proficiency by participating in performance tests that employ hypothetical scenarios and available facility/site aids, such as EALs.

Training Requirements - Offsite

- P3.15 Offsite emergency response personnel and organizations, including state, local, tribal, or private hospitals, public health, medical, or ambulance services, that are expected to support onsite response efforts, are offered:
- a. Training on facility- and site-specific emergency-related information, conditions, and hazards; and
 - b. The opportunity to participate in training and drills validating procedures for response activities expected to involve integration of onsite and offsite response resources.

Drills

- P3.16 Drills provide supervised, “hands-on” training and/or validation of classroom training for members of the ERO.
- P3.17 Drills provide opportunities to demonstrate responder proficiency in infrequently performed emergency management tasks.
- P3.18 Scheduled drills include scenario driven events that provide interface practice between the ERO and site medical and security organizations.
- P3.19 Drills are developed or modified based upon feedback from actual events, exercise evaluations, and self-assessments, or to validate new or revised procedures and equipment modifications.

Training Documentation and Records

- P3.20 Lesson plans, drill plans, training materials and facilities, instructor and student manuals, and training software are maintained, formally documented, and included in an index or matrix.
- P3.21 Training records are maintained for all personnel assigned ERO positions, primary and alternate, showing in-progress, final, and upcoming re-qualification status.
- P3.22 Drill and exercise participation and performance is documented for each member of the ERO.

D.3.3 Exercises

Performance Goal:

A formal exercise program validates all elements of an emergency management program over a 5-year period. The exercise program validates facility- and site-level emergency management program elements by initiating response to simulated, realistic emergency events/conditions in a manner that, as nearly as possible, replicates an integrated emergency response to an actual event. Planning and preparation use an effective, structured approach that includes documentation of specific objectives, scope, time lines, injects, controller instructions, and evaluation criteria for realistic scenarios. Each exercise is conducted, controlled, evaluated, and critiqued effectively and reliably. Lessons-learned are developed, resulting in corrective actions and improvements.

Evaluation Criteria:

Exercise Program

- P4.1 A *formal* exercise program includes the validation of elements of an emergency management program over a 5-year period.

- a. The exercise program includes a plan (e.g., a matrix) for validating all the elements of each program by incorporating specific objectives in exercises over the 5-year period.
 - b. The exercise program also includes provisions for incorporating objectives in each exercise that are designed to validate revised plans/procedures, implemented corrective actions, and program improvements.
 - c. The exercise program includes provisions for evaluating all exercises and establishes a critique process, which includes gathering and documenting observations of participants.
- P4.2 The exercise program involves testing emergency response capabilities by initiating response to simulated, realistic emergency events/conditions in exercises of varying scope over the 5-year period:
- a. Facility Operations-Based Exercise - A facility or group of facilities (i.e., with common facility-level ERO positions) annually tests the proficiency of personnel in facility-level ERO positions in accomplishing facility-specific emergency response duties and responsibilities.
 - b. Site Operations-Based Exercise - At least annually, the site tests the integrated emergency response capabilities of personnel in facility- and site-level ERO positions, and includes both facility- and site-level evaluation and critique. For multi-facility sites, the basis for the exercise is rotated among facilities or groups of facilities.
 - c. Full Participation Operations-Based Exercise - A site-level exercise is considered *full participation* if offsite organizations participate. Offsite response organizations are invited to participate in a site-level exercise at least once every 3 years.
- P4.3 The schedule of exercises includes:
- a. Periodic participation by appropriate DOE or NNSA radiological response assets, if the facility/site plans to use the assets in response to an emergency.
 - b. Security scenario events to test the interfaces between site security and the facility/site ERO.
- P4.4 Exercises of each of the Department's radiological emergency response assets are conducted at least once every three years. These assets include the Accident Response Group (ARG), Nuclear Emergency Support Team (NEST), Federal Radiological Monitoring and Assessment Center (FRMAC), Aerial Measuring System (AMS), National Atmospheric Release Advisory

Center (NARAC), Radiation Emergency Assistance Center/Training Site (REAC/TS), and Radiological Assistance Program (RAP).

- P4.5 At a minimum, building evacuation exercises are conducted annually consistent with Federal regulations [e.g., (41 CFR 102-74-360)], local ordinances, or NFPA standards, to ensure that employees are able to safely evacuate their work area.
- P4.6 Communications with DOE Headquarters (HQ), the Cognizant Field Element, and offsite agencies are tested at least annually or as often as needed to ensure that communications systems are operational.
- P4.7 Failed objectives of an exercise (i.e., “Deficiencies”), as determined by a DOE or NNSA organization responsible for evaluating the exercise, are re-evaluated during a drill or through a selected functional test within a fixed time period following the exercise.
- P4.8 Corrective actions and lessons-learned identified as a result of facility- and site-level exercise evaluation findings are addressed by the emergency management program.
- a. Completion of corrective actions for facility and site exercises includes a verification and validation process, which verifies that the corrective action has been put in place and validates that the corrective action has been effective in resolving the original finding;
 - b. The verification and validation process is independent of those who performed the corrective action; and
 - c. Corrective actions involving revision of procedures or training of personnel are completed before the next exercise.

Exercise Planning

- CE4.1 Exercise planning is effectively coordinated among onsite and offsite organizations or groups regarding their respective participation and exercise objectives. Any limitations or simulations regarding their participation are identified and documented.
- CE4.2 An exercise is fully documented by an Exercise Plan (EXPLAN) that includes: specific exercise objectives, scope, scenario, participants, simulations, time lines, injects (i.e., messages), technical data, safety and security provisions, controller instructions, and evaluation criteria.
- CE4.3 The EXPLAN is completed in sufficient time before the conduct of the exercise to allow for review and comments by DOE or NNSA line management and the DOE Associate Administrator of Emergency Operations.

- CE4.4 The EXPLAN contains sufficient information for effective conduct, control and evaluation of the exercise.
- a. The roles, responsibilities, and interfaces among exercise participants (i.e., players/responders, controllers, evaluators, and observers) are clearly addressed;
 - b. The provisions for exercise conduct and control are clearly identified; and
 - c. The provisions for exercise evaluation are clearly identified.
- CE4.5 Specific exercise objectives provide the basis for evaluating/validating the performance of response capabilities by each participating organization.
- CE4.6 The scenario is consistent with the set of exercise objectives and explicitly supports an evaluation/validation of each objective.
- CE4.7 The exercise evaluation criteria used are facility/site- or activity-specific, based on existing plans and procedures, and correlate with the exercise objectives.
- CE4.8 The scenario reflects current facility/site- or activity-specific hazards, correlates technically with the EPHA, and is technically accurate in terms of operations and radiological, chemical, biological, and meteorological data.
- CE4.9 The technical data that supports the scenario (e.g., operational, radiological, chemical, biological, medical, meteorological) is technically accurate and clearly and unambiguously presented.
- CE4.10 Simulations and limitations pertaining to participants and exercise activities are clearly identified and documented.
- CE4.11 Injects/messages contain accurate, unambiguous, and non-prompting information and technical data for the players/responders and provide proper direction for the exercise.
- CE4.12 Provisions for safety, security, and public/media interface are clearly identified and documented.

Exercise Preparation

- CE4.13 Coordination among participants includes provisions for exercise initiation, interruption, and termination.
- CE4.14 Controllers and Evaluators are provided generic and exercise-specific training.
- CE4.15 Controllers and Evaluators are provided with training on the scenario package, and safety and security/safeguards provisions.

CE4.16 Preparations, including participant briefings, safety provisions, staging of simulation props, positioning of controllers/evaluators, and establishing of initial conditions, are completed prior to exercise initiation.

CE4.17 Security of the exercise scenario is properly managed; pre-staging of players and/or prior knowledge of scenario material by players are effectively prevented.

Exercise Conduct/Control

CE4.18 Controller organization(s) are adequately staffed and positioned for effective exercise conduct/control.

CE4.19 Controllers conduct/control the exercise in accordance with the EXPLAN.

CE4.20 Controllers permit free play when free play would not interfere with the scenario.

CE4.21 Controllers prevent interference and/or prompting by non-responders.

CE4.22 The simulation of activities is sufficiently realistic to provide confidence that the activity could have been performed during a real emergency.

CE4.23 Players/responders perform their respective functions, initially and throughout the exercise, in a professional manner as if the situation were an actual emergency.

Exercise Evaluation

CE4.24 The evaluator organization is sufficiently staffed to evaluate the performance and key decision-making of the responders in satisfying the exercise objectives.

CE4.25 Evaluators display familiarity with responder organizations, functions, procedures, and anticipated responder decisions and response activities.

CE4.26 Responders/players are evaluated with respect to demonstrated proficiency of their respective responsibilities and functions, communication and coordination with other responders, familiarity and use of applicable procedures and equipment, and overall professional response.

CE4.27 Facilities and equipment are evaluated with respect to adequacy of functions/operability.

CE4.28 Procedures are evaluated with respect to their use by the responders, specifically, their adequacy of content for the tasks performed.

CE4.29 Notifications and communications are evaluated during every exercise.

Exercise Critique

CE4.30 Controllers conduct a post-exercise critique(s) to gather and document observations and solicit feedback from the players/responders.

CE4.31 A formal critique process is conducted by the controller/evaluator organization to determine whether the individual exercise objectives were accomplished based on a synthesis of all the observations and information/data gathered during the conduct of the exercise.

Documentation

CE4.32 An After Action Report (AAR) documents the results of the exercise critique and evaluation.

D.3.4 Readiness Assurance

Performance Goal:

The emergency management Readiness Assurance Program provides a framework and associated mechanisms for assuring that emergency plans, implementing procedures, and resources are adequate by ensuring that they are sufficiently maintained, exercised, and evaluated (including evaluations and assessments) and that appropriate and timely improvements are made in response to needs identified through coordinated and comprehensive emergency planning, resource allocation, training and drills, exercises, and evaluations.

Evaluation Criteria:

General

P5.1 An effective formal and structured Readiness Assurance Program is implemented consisting of evaluation and improvement programs, and documentation of the readiness of the emergency management program based on emergency planning and preparedness activities and the results of the readiness assurance program [e.g., in ERAPs]

Evaluation Program

P5.2 An evaluation program assures that emergency plans, implementing procedures, and resources are adequate and sufficiently maintained, exercised, and evaluated (including evaluations and assessments).

P5.3 Evaluations, including program evaluations and exercise evaluations, are based on a consistent set of performance-based evaluation criteria, issued by the Associate Administrator, Office of Emergency Operations [see DOE G 151.1-3, Chapter 4, Appendix D].

- P5.4 Self-evaluations:
- a. A self-assessment of the emergency management program is conducted annually by the facility/site or activity.
 - b. Findings (i.e., weaknesses or deficiencies) are identified in all program and exercise evaluations.
 - c. Records are maintained of readiness assurance self-evaluations (e.g., program or exercise self-assessments) and any related findings.
- P5.5 External evaluations:
- a. Evaluation schedules are coordinated with all involved organizations to minimize impacts and maximize benefits. Evaluation schedules are forwarded to the Associate Administrator, Office of Emergency Operations to ensure maximum coordination.
 - b. Personnel responsible for developing or maintaining the emergency management program as well as associated program documentation are made available during periodic external evaluations.
 - c. Findings (i.e., weaknesses or deficiencies) are identified in all external program and exercise evaluations.
 - d. Evaluated findings from program and exercise evaluations by organizations external to the facility/site or activity are acknowledged within 30-working days of receipt of the final evaluation report.
- P5.6 Formal evaluation reports are prepared that document evaluation results and specific findings.
- P5.7 Performance indicators (including performance measures and metrics) capture and track objective data regarding the performance of emergency management programs in key functional areas; the results are shared with the Cognizant Field Element and Associate Administrator, Office of Emergency Operations.
- P5.8 No-Notice Exercises (NNXs), conducted at the discretion of the Associate Administrator, Office of Emergency Operations, determine if the ERO accomplishes selected objectives based on applicable plans, procedures, and/or other established requirements. Involvement is limited to providing trusted agents and responding when the exercise is conducted.

Improvement Program

- P5.9 An improvement program provides assurances that appropriate and timely improvements are made in the emergency management program in response to needs identified through coordinated emergency planning, resource

allocation, program assistance activities, evaluations, training, drills, and exercises.

- P5.10 Continuous improvement in the emergency management program results from implementation of corrective actions for findings (e.g., deficiencies, weaknesses) in all types of evaluations, including both self-assessments and external evaluations.
- P5.11 Evaluated findings from program and exercise evaluations by organizations external to the facility/site or activity are acknowledged and include corresponding corrective action plan.
- P5.12 Corrective action plans are developed within 30-working days of receipt of the final evaluation report.
- P5.13 Corrective actions are completed as soon as possible. Corrective actions addressing revision of procedures or training of personnel are completed before the next annual self-assessment of the program.
- P5.14 Completion of corrective actions includes a verification and validation process, independent of those who performed the corrective action, that verifies that the corrective action has been put in place, and validates that the corrective action has been effective in resolving the original finding.
- P5.15 Closure of findings from program and exercise evaluations by organizations external to the facility/site or activity is validated by the evaluating organization.
- P5.16 The improvement program prepares corrective action plans, and establishes and maintains a tracking system to monitor and verify correction of findings from all program and exercise evaluations, or from actual responses.
- P5.17 The improvement program includes a system for incorporating and tracking lessons learned from training, drills, actual responses, and a site-wide lessons learned program.
- P5.18 An established improvement program ensures that relevant lessons learned (i.e., complex-wide; other non-DOE sources) are received at the facility/site or activity, are reviewed for applicability, and incorporated in the emergency management program as appropriate.
- P5.19 An effective and reliable improvement program is ensured through sustained management commitment to continuous improvement of the emergency management program.

Emergency Readiness Assurance Plan (ERAP)

- P5.20 The ERAP highlights program status, including, significant changes in emergency management programs (i.e., planning basis, organizations, exemptions) and comparison of previous ERAP goals, milestones, and objectives to achievements.
- P5.21 The ERAP identifies what the program goals were for the fiscal year that ended coincident with the due date for the report and the degree to which these goals were accomplished. The ERAP also identifies the goals for the next fiscal year.
- P5.22 The ERAP documents evaluation results and the status (i.e., open/unresolved or closed) of associated corrective actions. Evaluation results include facility/site and activity self-assessments and performance measures.
- P5.23 The ERAP contains a sufficient level of accurate information and analysis to provide management at all levels with an adequate tool for gauging emergency management program readiness.
- P5.24 Accurate site (i.e., facilities consolidated into one site document) ERAPs are developed and submitted to the responsible DOE/NNSA Cognizant Field Elements.

D.4 Response Elements

D.4.1 Emergency Response Organization (ERO)

Performance Goal:

An ERO, a structured organization with overall responsibility for initial and ongoing emergency response and mitigation, is established and maintained for each facility/site and activity. The ERO establishes effective control at the scene of an event/incident and integrates ERO activities with those of local agencies and organizations that provide onsite response services. An adequate number of experienced and trained personnel, including designated alternates, are available on demand for timely and effective performance of ERO functions.

Evaluation Criteria [RESPONSE Functions]:

ERO Organizational Structure

- P/E6.1 The organizational configuration of the ERO is based on actual or potential emergency conditions.
- P/E6.2 Management structure of the emergency response facility provides for the collecting and disseminating accurate data, setting priorities, assigning work

to functional groups, and keeping key emergency response staff abreast of emergency response status.

- P/E6.3 An “Emergency Director (ED)” or equivalently titled individual manages and controls all aspects of the facility/site or activity overall response, and has the authority to use necessary resources to mitigate the emergency.
- P/E6.4 The ED has the authority and responsibility to perform the required functions, including initial activation of onsite response assets, notification of offsite authorities, and requests for offsite assistance, in accordance with the National Response Plan (NRP) and the National Incident Management System (NIMS).
- P/E6.5 The division of authority and responsibility between the Incident Commander (IC) and the ED position is clearly established and maintained.
- P/E6.6 Control of operations, monitoring, and repair teams is clearly vested in a single ERO position or clearly defined between multiple ERO positions.

ERO Activation

- P/E6.7 The ERO activation is based on actual or potential emergency conditions.
- P/E6.8 The on-shift operations staff performs initial ERO response functions.
- P/E6.9 The ERO is functionally staffed and activated in a timely manner; key emergency response facilities are operational within an hour after declaration of an OE.
- P/E6.10 Staffing of ERO positions following the declaration of an OE is orderly, controlled, and verifiable:
 - a. Personnel assigned to ERO positions gain access to their response stations without impediment.
 - b. Non-ERO personnel are excluded from emergency response work areas.
 - c. Individuals in key response positions/functions are readily identifiable by other ERO staff (e.g., through use of status board(s) or badging).
- P/E6.11 Procedures and/or checklists, which describe the major activation and initial response activities of key members of the ERO, are used.
- P/E6.12 The order of succession of management personnel responsible for managing the emergency in the absence of the primary designated ED is clearly designated/ implemented.
- P/E6.13 Extended operations (i.e., shift arrangements to cover 24-hour operations) are anticipated and planned.

ERO Operations

- P/E6.14 The ED, in the lead role responsible for emergency response, adequately and effectively performs assigned functions utilizing sufficient and practical knowledge of the effected facility/site or activity and its operations, the emergency response team and its mission, and the available tools and resources necessary to affect an appropriate response and mitigate the emergency.
- P/E6.15 Transfer of a command and control function to another emergency facility, within an emergency facility, or to a command external to the ERO or ICS (e.g., another Federal agency, such as DOJ/FBI) is completed in an orderly and formal manner, and ERO personnel are informed of the transfer.
- P/E6.16 The fully staffed ERO establishes effective internal and external interfaces with other agencies and organizations; external interfaces may include: local, state, tribal, and federal agencies, and non-governmental groups such as concerned citizens and the media.
- P/E6.17 An individual in the ERO is assigned liaison responsibilities for coordinating with offsite agencies to ensure that effective communications are initiated and maintained during an emergency.
- P/E6.18 Members of the ERO:
- a. Perform in their roles, functions, and interfaces and in their use of emergency equipment, facilities, and resources in a timely, effective and efficient manner;
 - b. Clearly acknowledge and understand authorities and responsibilities in functional areas; and
 - c. Identify and access available response resources (e.g., personnel, equipment, consumables, and replacement parts), and, as appropriate, take account of resource limitations and specific capabilities.
- P/E6.19 Based on current knowledge of the situation, the responsible ERO operations and technical support staff determine and implement a reasonable, well-planned course of action within their sphere of responsibility.
- P/E6.20 When priority actions are identified, tasking is clearly made to emergency response staff, and actions are followed through to completion.
- P/E6.21 Specialty groups (e.g., consequence assessment, maintenance, operations, technical staff) supporting the emergency response staff provide timely information to the decision-making process.

- P/E6.22 Adequate data are obtained and analyzed to support the operations staff in assessing and mitigating the emergency events.
- P/E6.23 Information is accurately and efficiently transmitted in an orderly and documented manner throughout the chain of command and between/within emergency facilities.
- P/E6.24 The use of acronyms, code words, convention and/or technical terminology causes no misunderstandings related to the response and associated data.
- P/E6.25 Periodic briefings are provided on the status of the emergency and current significant response priorities and activities.
- P/E6.26 Communications are maintained with and information is provided regularly to the DOE Headquarters Emergency Management Team (EMT).
- P/E6.27 The ERO management effectively coordinates State and DOE site requests for use of DOE/NNSA assets.
- P/E6.28 An individual is assigned liaison responsibilities with personnel representing DOE/NNSA assets (e.g., NARAC, FRMAC, AMS, RAP, REAC/TS, ARG, and/or NEST) involved in the response to coordinate logistics, ensure that effective communications are initiated and maintained, and ensure that data is exchanged using consistent units of measure.
- P/E6.29 ERO personnel are provided with adequate briefings concerning safety, operations, communications, and hazards before being deployed.
- P/E6.30 ERO teams are debriefed upon return from assigned missions and their accomplishments, failures, exposures, and status information are recorded and made available to other teams and emergency facilities.
- P/E6.31 The responsible individual authorizes emergency response personnel to receive exposures in excess of site administrative limits (or other Federal criteria) for carrying out lifesaving or other emergency activities.
- P/E6.32 An individual trained to recognize, categorize, and classify events and to conduct appropriate notifications is available 24-hours a day, 7-days a week. This individual's authority is unambiguous and clearly communicated throughout the ERO.

Evaluation Criteria [Special RESPONSE Functions/Positions]:

Incident Command System (ICS)

- P/E6.33.1 An IC is in charge at the event scene:

- a. Control and coordination at the event/incident scene is consistent with the NRP and the NIMS/Incident Command System (ICS), which integrates local agencies and organizations that provide onsite response services.
 - b. The ICS is identified in the emergency plan and memoranda of understanding/agreement with local response organizations.
- P/E6.33.2 The ICS is organized in the five major functional areas of NIMS/ICS: Command, Operations, Planning, Logistics, and Finances and Administration.
- P/E6.33.3 The incident is assessed and priorities are established with life saving, safety, and incident stabilization receiving top priority.
- P/E6.33.4 Incident command strategic goals and tactical objectives are clear and a flexible action plan is implemented.
- P/E6.33.5 Incident command evolves from providing oral direction to the development of a written Incident Action Plan (IAP).
- P/E6.33.6 The incident command staff continually assesses the situation, develops a mitigation strategy, and requests additional assets as needed.
- P/E6.33.7 Incident command coordinates internal and external response assets in an effective manner.
- P/E6.33.8 An ICS command post is strategically located in a safe area, where command and control may take place safely and effectively.
- P/E6.33.9 Command post and staging area(s) habitability is periodically assessed and moved, as necessary, for safety purposes.
- P/E6.33.10 Incident command staff ensures that response personnel take necessary precautions for personal safety and contamination control, as follows:
- a. Incident command staff establishes a staging area where arriving asset personnel are briefed; communications are checked; special equipment is issued; and the assets are deployed upon request.
 - b. Asset personnel being released are debriefed; personnel are accounted for; personnel and equipment are surveyed for contamination; decontaminated as necessary; and issued equipment is returned.

Hazardous Material Survey, Sampling, and Sample Analysis Teams

- P/E6.34.1 Teams implement survey and sampling procedures in a timely manner:

- a. Field teams are provided with adequate monitoring equipment and Personnel Protective Equipment (PPE) to accomplish field monitoring and plume tracking within and beyond the EPZ; and
 - b. Teams correctly use protective equipment, such as protective clothing and respirators, filter masks, and dosimetry.
- P/E6.34.2 Equipment required for emergency response is adequate, accessible, functional, and calibrated.
- P/E6.34.3 Teams make effective use of maps or general arrangement drawings showing pre-determined and potential monitoring points.
- P/E6.34.4 Teams are briefed on facility and meteorological conditions, and exposure control procedures before deployment and when changes occur.
- P/E6.34.5 Teams maintain effective communications to transmit accurate and timely readings and results to their team coordinator.
- P/E6.34.6 Field teams are well directed and effectively controlled by emergency response management, who:
- a. Provide directions to survey specific areas;
 - b. Provide directions to minimize hazardous material exposure by exiting high airborne and whole body dose areas (i.e., for radiological materials), or high concentration areas (i.e., for toxic non-radiological materials), when not actively engaged in sample and survey activities; and
 - c. Set exposure limits for survey and tracking teams, and collect and record survey results.
- P/E6.34.7 Teams utilize proper survey equipment and log results accurately.
- P/E6.34.8 Teams collect samples, bag and mark them, and log results accurately and efficiently.
- P/E6.34.9 Samples are received, properly packaged, and labeled with information such as sample time and date, sample location, volumetric data, sample media, and sample or survey collection person's name.
- P/E6.34.10 Analysis procedures and equipment are used to support processing of samples received, either properly analyzing the samples in the field or transporting them to a laboratory.
- P/E6.34.11 Analysis results are promptly and accurately communicated to other emergency response organizations.

Security Staff

- P/E6.35.1 Security procedures of protective forces for carrying out their responsibilities during response to OEs are promptly, safely, efficiently, and effectively implemented.
- P/E6.35.2 An ICS, in accordance with NIMS/ICS requirements, is implemented for security emergencies.
- P/E6.35.3 Response of protective force personnel and equipment is characterized by effective command and control.
- P/E6.35.4 Access and egress control is quickly and properly maintained for the facility/site or activity, facility/site areas, impacted areas (i.e., safe perimeters), and emergency response facilities.
- P/E6.35.5 Security practices facilitate timely movement and access of facility/site operating and response personnel (including offsite personnel) to required areas during the emergency situations.
- P/E6.35.6 Under emergency conditions, material accountability and protection for Special Nuclear Material (SNM) and other critical DOE assets are handled in a timely and effective manner.
- P/E6.35.7 Common protocol for local law enforcement backup of the onsite security force is used (e.g., use of deadly force, weapons employment, tactics, code words, radio frequencies, etc.).
- P/E6.35.8 A mutual understanding of authorities and responsibilities, response plans, utilization of command and control facilities, and terminology enables site security to effectively coordinate and correlate response activities with other components of the ERO.

Fire and Rescue

- P/E6.36.1 Fire/rescue personnel and equipment are assembled and deployed to the scene of the emergency in a safe and timely manner.
- P/E6.36.2 Fire/rescue personnel take necessary precautions for contamination, exposure, heat, and personal safety.
- P/E6.36.3 Search and rescue operations are carried out in an efficient manner, coordinating their efforts with medical, industrial hygiene, and health physics personnel.
- P/E6.36.4 Injured personnel are properly extricated, immobilized, and moved during search and rescue operations.

P/E6.36.5 When responding onsite, both onsite and offsite fire personnel are outfitted with the appropriate specialized equipment and supplies specific to the onsite hazards.

Repair and Maintenance

P/E6.37.1 Facility and field repair and maintenance activities are carried out in a timely and efficient manner:

P/E6.37.2 Proper tools are available for repair and maintenance activities and the procurement of replacement parts is expedited.

P/E6.37.3 Emergency work order procedures are used and emergency tagging (e.g., lockout/tagout or clearance) is implemented.

P/E6.37.4 Repair and maintenance activities include personnel protection and monitoring as well as coordination with support groups, such as health physics and chemistry personnel.

Evaluation Criteria [PROGRAMMATIC Functions]:

ERO Staffing

P6.38 *ALL* personnel who may be needed to perform duties, beyond those specified by 29 CFR 1910.120 for the first responder awareness level, during a response to any of a broad range of emergencies defined in the Hazards Survey or EPHA are members of the ERO.

P6.39 Fully trained personnel are assigned to facility- and site-level ERO positions to ensure adequate staffing for emergency response.

P6.40 All personnel assigned to facility- and site-level ERO positions demonstrate their proficiency in their assigned positions through periodic participation in an exercise, an evaluated drill, or an actual response. All primary and alternate personnel accomplish this participation on a rotating basis.

P6.41 An adequate number of experienced and trained personnel for initial and ongoing response, including designated alternates, are assigned to each functional area.

ERO Maintenance

P6.42 To ensure that personnel are available on demand for timely and effective performance of ERO functions, the ongoing, standby staffing of ERO emergency facility positions and response teams is effectively accomplished by:

- a. Using a technique, such as duty-cycle or static roster, to ensure that qualified personnel are available on-demand and properly assigned.
- b. Ensuring that sufficient trained personnel for initial and ongoing response, including designated alternates, are candidates for call-up in each functional area.
- c. Periodically reviewing ERO rosters for accuracy (e.g., current qualifications, correct phone number, correct response time etc.).
- d. Periodically reviewing and updating ERO personnel qualifications.

P6.43 Communication systems used to activate both on-shift and off-shift emergency response personnel are periodically tested to ensure their adequacy and reliability.

D.4.2 Offsite Response Interfaces

Performance Goal:

Effective interfaces are established and maintained to ensure that emergency response activities are integrated and coordinated with the Federal, Tribal, State, and local agencies and organizations responsible for emergency response and protection of the workers, public, and environment, in accordance with the NRP and NIMS.

Evaluation Criteria [RESPONSE Functions]:

Activation

- P/E7.1 Interfaces with Federal, Tribal, State, and/or local authorities responsible for protection of the public and the environment are identified and established.
- P/E7.2 Support is requested, as required, from Federal, Tribal, state, and/or local response agencies/organizations responsible for augmenting site resources in response to an onsite emergency event.
- P/E7.3 Offsite authorities are informed of the availability of assistance from DOE or NNSA national assets (i.e., RAP, FRMAC, NARAC, AMS, and REAC/TS) and subsequent requests for support activate the applicable assets.

Communication and Information Exchange

- P/E7.4 Methods of communication (e.g., telephone circuits and/or radio channels) and communication protocols with the offsite agencies/organizations are in place, identified, and operable.
- P/E7.5 Communication capabilities allow effective communication with offsite officials, the Cognizant Field Element, and the DOE HQ EMT.

- P/E7.6 Offsite officials are briefed upon activation of their respective facilities.
- P/E7.7 Offsite agencies/organizations, responsible for emergency response and for the protection of workers, the public, and the environment, are provided initial and ongoing information sufficient to perform their respective functions.
- P/E7.8 Timely, clear, accurate, and effective information exchange occurs between the ERO and offsite personnel.
- P/E7.9 Mutual understanding of acronyms, code words, conventions, and/or technical terminology (e.g., units) provides effective information exchange.
- P/E7.10 Incoming offsite agency inquiries/concerns are directed to the appropriate personnel for resolution.

Coordination and Integration

- P/E7.11 A mutual understanding of capabilities, especially the command and control system, supports an integrated and effective response.
- P/E7.12 An effective working relationship exists between the offsite officials and their ERO counterparts.
- P/E7.13 Coordination and integration with offsite response agencies and organizations follow established, pre-arranged and documented plans and protocols, including, responsibilities and authorities, coordination of response, notifications, facility activations, communications, Emergency Operations Center (EOC) interfaces, public information activities, and logistic protocols (e.g., working space and site access)
- P/E7.14 Provisions are in place and implemented with State, Tribal, and local agencies and organizations for coordinating the release of information about the emergency to the public.
- P/E7.15 There is a mutual understanding of response measures to be implemented by the facility/site in anticipation of the involvement of local and State public health agencies or agricultural authorities following an actual or potential release of a biological hazardous material.

Evaluation Criteria [PROGRAMMATIC Functions]:

Maintaining Interfaces

- P7.16 An individual (s) with the appropriate authority, knowledge, and training is responsible for establishing and maintaining ongoing and effective interfaces with offsite political, technical, security (e.g., local law enforcement), public health, and emergency services officials.

- P7.17 Agreements to provide mutual assistance to or to receive assistance from offsite organizations (e.g., hospitals, fire departments) are documented in a formal memorandum of agreement or memorandum of understanding, which are accessible in the emergency plan and maintained current through periodic reviews.
- P7.18 Offsite response agencies and organizations are provided with specific information and/or offered training on the nature and characteristics of the biological agents and/or toxins present at the DOE/NNSA Biosafety facility.
- P7.19 Effective coordination with offsite response agencies and organizations is accomplished and maintained through routinely scheduled meetings.
- P7.20 Through formal agreements, DOE supports offsite agencies under the “good neighbor” policy, in areas of emergency assistance including: fire, medical, and hazardous material releases (including, field monitoring resources)
- P7.21 Routine coordination and interfaces through training, drills, and “good neighbor” support ensure that offsite services (e.g., fire and medical, law enforcement), as indicated in the documented agreements, will be integrated with onsite resources.
- P7.22 Planned response functions to be provided by offsite organizations are periodically tested and verified.
- P7.23 Offsite response organizations are invited to participate in a site-level exercise at least every 3 years.
- P7.24 Organizations which may be needed in a supporting role and/or needed for long-term support have been identified and pre-designated offsite points-of-contact, including organization, names, and telephone numbers are documented, maintained, and available to the response organization.

D.4.3 Emergency Facilities and Equipment

Performance Goal:

Facilities and equipment adequate to support emergency response are available, operable, and maintained. At a minimum, facilities/sites include an adequate and viable command center. Equipment includes, but is not limited to, PPE, detectors, and decontamination equipment.

Evaluation Criteria [RESPONSE Functions]:

General

- P/E8.1 Facilities and equipment adequate to support emergency response are available, operable and maintained.

Facilities

- P/E8.2 A facility is available for use as a command center by the ED, the EMT, and other members of the ERO during an emergency response.
- P/E8.3 Characteristics of the dedicated command center, and other auxiliary facilities, are adequate to reliably support the designated functions and assignments.
- P/E8.4 As required, facilities are available to accommodate classified discussions at the appropriate clearance levels.
- P/E8.5 Provisions are established for use of an alternative location if the primary command center is not available.
- P/E8.6 Facility systems and installed equipment (e.g., HVAC, sanitation, lighting, radiation monitors, computer systems, communications, and visual displays) are adequate to support facility functions and level of staffing.
- P/E8.7 Emergency response facilities use backup or alternate power supplies in the event of loss of power.
- P/E8.8 As necessary, conversion of facilities to response facilities for the emergency is accomplished in a timely and efficient manner.
- P/E8.9 Command center access control is adequate and results in the efficient and timely identification of assigned staff.

Equipment

- P/E8.10 The capability to notify employees of an emergency to facilitate the safe evacuation of employees from the work place, immediate work area, or both is available.
- P/E8.11 Provisions are established to ensure operational compatibility between facility response capabilities and DOE or NNSA assets.
- P/E8.12 Adequate PPE, and other emergency equipment and supplies are readily available and operable to meet the needs determined by the results of the EPHA.
- P/E8.13 Actual function(s) and operating characteristics of specific equipment adequately support the intended function(s) during emergency response.
- P/E8.14 Secure communication equipment is available to support classified discussions and transmittal of classified documents/reports.
- P/E8.15 Equipment needed during the emergency response functioned as expected and intended (or was repaired or obtained in a timely manner), including: current

reference materials (e.g., maps, facility drawings); decisional aids (including computers); area and process monitors; public address system; PPE; portable monitoring instruments and personnel monitoring devices; siren and alarm systems; decontamination equipment; communication equipment.

Evaluation Criteria – [PROGRAMMATIC Functions]:

Facilities

P8.14 Designated response facilities, especially multi-use facilities, are adequately maintained to ensure timely activation and availability to support an emergency response.

Equipment

P8.15 Inventories of all emergency equipment and supplies are maintained with the equipment location identified.

P8.16 Periodic inspections, operational checks, calibration, preventive maintenance and testing of equipment and supplies are carried out as required in accordance with manufacturer's instructions or industry standards.

P8.17 Communication systems with DOE HQ, Cognizant Field Elements, and offsite organizations are periodically tested.

P8.18 Communication systems used to activate both on-shift and off-shift emergency response personnel are tested and maintained regularly.

D.4.4 Categorization and Classification

Performance Goal:

Major unplanned or abnormal events or conditions that: involve or affect DOE/NNSA facilities/site and activities by causing or having the potential to cause serious health and safety or environmental impacts; require resources from outside the immediate/affected area or local event scene to supplement the initial response; and, require time-urgent notifications to initiate response activities at locations beyond the event scene, are recognized promptly, categorized, and declared as OEs.

In general, to be considered an OE, an event or condition involving the uncontrolled release of a hazardous material will: immediately threaten or endanger personnel who are in close proximity of the event; have the potential for dispersal beyond the immediate vicinity of the release in quantities that threaten the health and safety of onsite personnel or the public in collocated facilities, activities, and/or offsite; and have a potential rate of dispersal sufficient to require a time-urgent response to implement protective actions for workers and the public. In addition to being categorized as OEs, events involving the actual or potential airborne release of (or loss of control over) hazardous materials from an onsite facility or activity also require prompt and accurate classification as an Alert,

Site Area Emergency, or General Emergency, based on health effects parameters measured or estimated at specific receptor locations (e.g., facility and site boundaries) and compared with PACs. Predetermined conservative onsite protective actions and offsite protective action recommendations are associated with the classification of these OEs.

Evaluation Criteria [RESPONSE Functions]:

Process

- P/E9.1 Authority and responsibility for categorizing an event/condition, and if necessary, determining the emergency classification, is clearly defined, recognized, and understood by ERO personnel.
- P/E9.2 The designated (authorized) individual with the responsibility for categorization and classification makes the determination(s).
- P/E9.3 Recognition/categorization/classification process of OEs is effectively integrated with existing operations, management, emergency response, reporting activities, and the security classification scheme.

Categorization

- P/E9.4 Categorization of abnormal events/conditions as OEs is accomplished accurately using facility/site- or activity-specific criteria.
- P/E9.5 An OE event is categorized as promptly as possible, but no later than 15-minutes after event recognition/identification/discovery.
- P/E9.6 The set of facility/site- or activity-specific criteria is readily accessible to the responsible decision maker.
- P/E9.7 Criteria for categorizing OEs are clear, straightforward, usable, and unambiguous to the decision maker, and stated in terms of readily available indications or observable conditions.
- P/E9.8 If the event or condition is categorized as an OE involving an airborne release of (or loss of control over) hazardous materials (i.e., from a facility/site), the decision maker recognizes the requirement to promptly classify the event. This does not apply to biological hazardous materials.
- P/E9.9 A tool (i.e., an EAL-like tool) for recognizing and categorizing biological OEs, based on recognition factors identified in the EPHA, is part of the DOE/NNSA emergency management program for Biosafety facilities. Default initial protective actions are associated with each biological OE.
- P/E9.10 An abnormal event/condition, categorized as an OE, is only downgraded (e.g., to Significance Level 1-4) if the original categorization was incorrect. A

properly categorized OE remains in effect until the emergency response is terminated.

Classification

- P/E9.11 Classification of an OE involving the actual or potential airborne release of (or loss of control over) hazardous material is accomplished promptly and accurately using a current set of a facility/site-specific EALs. [Classification does not apply to biological hazardous materials.]
- P/E9.12 Facility/site-specific EALs are applicable to the spectrum of potential OEs identified by the EPHA.
- P/E9.13 Appropriate facility/site-specific EALs are readily accessible to the responsible decision maker.
- P/E9.14 Classification of an OE involving the actual or potential airborne release of hazardous material as Alert, Site Area Emergency, or General Emergency is based on the distance at which estimated consequences exceed the applicable health effect threshold [i.e., PAC for the specific hazardous material released].
- P/E9.15 EALs for classifying OEs are clear, straight forward, usable, and unambiguous to the decision maker.
- P/E9.16 EALs for classifying OEs provide for early recognition, are reliable, redundant, and internally consistent, and are comprehensive and anticipatory of potential/future consequences.
- a. EALs are stated in terms of readily available indications or observable conditions.
 - b. Facility/site-specific EALs are developed and approved for the spectrum of OEs resulting in the actual or potential airborne release of (or loss of control over) hazardous material OEs, as analyzed in the EPHA.
 - c. Facility/site EALs provide for classifying events on the basis of measured or predicted hazardous material consequences at specific receptor locations (i.e., facility and site boundaries).
- P/E9.17 If a suspected release of (or loss of control over) hazardous material fails to meet or exceed an EAL, then a common sense, conservative assessment of the indications or observable conditions leads to an initial default estimate of the classification of the emergency event/condition using the discretionary EAL (i.e., a discretionary EAL is included in the EAL set to compensate for possible incompleteness and to ensure that a decision can be made rapidly based on the current understanding of the situation).

- P/E9.18 Associated with a specific OE event EAL, the decision maker obtains default (i.e., pre-determined), conservative Protective Actions (PAs), for immediate implementation onsite, and Protective Action Recommendations (PARs), for immediate recommendation offsite.
- P/E9.19 The current classification is modified (i.e., upgraded) based on continuous monitoring for event degradation or a reassessment that indicates that the event is more severe than originally perceived.
- a. An OE is reclassified at a lower classification if the original classification decision was in error (e.g., the decision maker used the wrong EAL or received incorrect information).
 - b. A properly classified OE remains in effect until the emergency response is terminated.
- P/E9.20 Site-wide, non-facility-specific EALs are used to classify events such as: terrorist threats, major natural phenomena, external events that can affect site operations, etc.

Evaluation Criteria [PROGRAMMATIC Functions]:

- P9.21 OE categorization criteria and EALs are reviewed and tested regularly against a range of initiating conditions and emergency event/condition scenarios to validate the indicated emergency categorization/classification.

D.4.5 Notifications and Communications

Performance Goal:

Initial emergency notifications are made promptly, accurately and effectively to workers and emergency response personnel/organizations, appropriate DOE/NNSA elements, and other Federal, Tribal, State, and local organizations and authorities. Accurate and timely follow-up notifications are made when conditions change, when the emergency classification (as an Alert, Site Area Emergency, General Emergency) is upgraded, or when the emergency is terminated. Continuous, effective, and accurate communication among response components and/or organizations is reliably maintained throughout an OE.

Evaluation Criteria:

Notifications

- P/E10.1 For OEs, prompt initial emergency notifications are accurately and efficiently made to workers and emergency response personnel/organizations, including DOE or NNSA Cognizant Field Element EOCs and the HQ Operations Center; other Federal, Tribal, State, and local response organizations; as well as all other appropriate organizations and authorities.

- P/E10.2 Tribal, State, and local officials, the Cognizant Field Element EOC, and the HQ Operations Center are notified within 15 minutes of classification of an OE as an Alert, Site Area Emergency, or General Emergency; all other organizations are notified within 30 minutes.
- P/E10.3 The Cognizant Field Element EOC and the Headquarters Operations Center are notified within 30 minutes of the declaration of an OE that does not require classification; local, State, and Tribal, and all other organizations are notified within 30 minutes or as established in mutual agreements.
- P/E10.4 Points of contact for emergency notifications are accurate and readily available to response personnel.
- P/E10.5 Emergency notifications to the HQ Operations Center consist of a phone call providing as much information as is known at the time. The same information is also provided by e-mail or a fax either immediately prior to or following the phone call. Information for initial notification includes as much as possible of the following:
- (a) An OE has been declared and, if appropriate, the classification of the emergency;
 - (b) Description of the emergency;
 - (c) Date and time the emergency was discovered;
 - (d) Damage and casualties;
 - (e) Whether the emergency has stopped other facility/site operations or program activities;
 - (f) Protective actions taken and/or recommended;
 - (g) Notifications made;
 - (h) Weather conditions at the scene of the emergency;
 - (i) Level of any media interest at the scene of the emergency or at the facility/site; and
 - (j) Contact information for the DOE or NNSA on-scene point of contact.
- P/E10.6 A rapid notification and recall system is used to make initial and follow-up notifications to primary and alternate response staff. The system provides for authentication and feedback indicating unsuccessful contact.
- P/E10.7 Follow-up notifications use pre-arranged and standardized content and format that supports the inclusion of critical information concerning: the nature of the

event, description and status; key times; classification and release status (as required); meteorology; protective actions; affected facility; and, notification authority.

- P/E10.8 Follow-up notifications are made when conditions change or when the emergency classification is upgraded or the emergency is terminated.
- P/E10.9 The ED or designee personally approves release of notification information.
- P/E10.10 Emergency status reports (also referred to as situation reports or SITREPs) are forwarded to the next-higher EMT on a continuing basis throughout the OE.

Communications

- P/E10.11 A formally established communication chain for reporting and notification within the facility, site-wide, and to offsite organizations is properly followed.
- P/E10.12 Installed public address and siren systems adequately accomplish the notifications of workers and onsite or neighboring public.
 - a. Installed building and area alarms or public address systems alert facility personnel to emergency conditions.
 - b. Systems are in place for notification of onsite workers and public present onsite but outside the immediate vicinity of the affected facility.
 - c. Where agreements with offsite agencies dictate, systems alert the public outside the site boundary.
- P/E10.13 Communications systems are in place to support management and tracking of evacuation of facility personnel, personnel accountability and assembly.
- P/E10.14 Installed voice communications systems adequately accomplish notification and information exchange processes.
 - a. Reliable equipment exists for communications with emergency organizations and response personnel.
 - b. Dedicated primary and backup voice communications links are provided between key emergency response facilities and sufficient non-dedicated voice communication links are provided to access offsite organizations.
 - c. Mobile and commercial phone lines are available.
- P/E10.15 Continuous, effective, and accurate communications among response components and/or organizations (e.g., event scene responders, emergency managers, response facilities, and workers who have taken protective actions) is reliably established and maintained throughout an OE.

Documentation/Reports

- P/E10.16 Notifications and key communications are properly documented and displayed in emergency response facilities.
- P/E10.17 A formal system is in place to record, sequence, validate, and track the flow and chronology of emergency information.
- P/E10.18 Logs are maintained and other record-keeping methods utilized to support post-event analysis, report production, and a legally defensible chronology of notification and communications activities.
- P/E10.19 All reports and releases are reviewed for classified or Unclassified Controlled Nuclear Information (UCNI) prior to being provided to personnel without security clearances, entered into unclassified databases, or transmitted using non-secure communications equipment.
- P/E10.20 Following termination of the emergency response, and in conjunction with the Final Occurrence Report, each activated EMT develops and submits a final report on the emergency response to the ED for submission to the Associate Administrator, Office of Emergency Operations.

D.4.6 Consequence Assessment

Performance Goal:

Estimates of onsite and offsite consequences of actual or potential releases of hazardous materials are computed and assessed correctly and in a timely manner throughout the emergency. Consequence assessments are: integrated with event classification and protective action decision-making; incorporated with facility and field indications and measurements; and coordinated with offsite agencies.

Evaluation Criteria [RESPONSE Functions]:

Process

- P/E11.1 A Timely Initial Assessment (TIA) of the actual or potential consequences of an emergency is performed effectively and efficiently, shortly after initial classification, using any available real-time event and meteorological data to provide an event-specific estimate of consequences.
- P/E11.2 Timely in-depth assessments of event consequences are made continuously throughout an emergency.
 - a. Consequence estimates performed by hand and/or from computer calculations are accomplished in a timely and efficient manner throughout the emergency to adequately assess the actual or potential onsite and offsite consequences.

- b. Assessments are updated when there are actual and projected changes in facility status, release conditions, or meteorology, or when there are data from field monitoring teams.
 - c. Different models, assumptions, and input data are used, as available, to add to the understanding of the event and its consequences.
 - d. Indicators (e.g., system pressures, flow rates, radiation levels, release rates, etc.), necessary to continually assess the consequences of the emergency events/conditions, are identified and monitored.
- P/E11.3 Consequence assessment process is integrated with processes for categorizing an event as an emergency, determining the appropriate emergency class, protective action decision-making, and locating and recovering materials.
- P/E11.4 Provisions are made for requesting support from the DOE radiological emergency response assets (e.g., AMS or NARAC) to assist in accident and consequence assessments as well as to estimate the integrated impact of a hazardous materials release to onsite and offsite populations.
- P/E11.5 Facilities have access to NARAC or have procedures in place to activate or request NARAC capabilities:
- a. If a facility has the potential for an OE classified as a General Emergency, connectivity to NARAC capabilities is established and procedures are in place to use the NARAC capability effectively as part of near real-time consequence assessment activities for the mode (primary, backup, corroborating) selected by the facility.
 - b. If a facility has the potential for an OE classified as a Site Area Emergency, procedures are in place to activate or request NARAC capabilities and to use those capabilities as part of near real-time consequence assessment activities.
- P/E11.6 For facilities with access to NARAC, or that have procedures in place to activate or request NARAC capabilities, meteorological data and information on source terms for actual or potential releases of hazardous materials to the atmosphere are available or can be made available to NARAC in a timely manner to facilitate near real-time computations.
- P/E11.7 Natural phenomena (e.g., tornados, floods, severe wind, ice, or snow), which may result in or exacerbate an emergency condition at the facility, operation, and/or activity, are monitored.
- P/E11.8 A formal document control system is implemented during an emergency to record, sequence, validate, and track the flow and chronology of information.

- P/E11.9 A primary function of the consequence assessment process for releases of biological agents, either *observed* or *unobserved*, involves the confirmation that a release to the environment from a biosafety facility has occurred.

Consequence Calculations

- P/E11.10 Tools used in consequence assessment, such as system hardware and software for meteorological monitoring and dose modeling, etc., are available, reliable, calibrated, and consistent with DOE and industry standards.
- P/E11.11 The type of hazard and source term for the release of a hazardous material is successfully determined either with available and reliable facility system parameters and effluent monitors or with data that is not normally monitored and measured.
- a. Data for source term estimates is available from reliable sources (e.g., stack or process flow rates, concentrations, tank volumes, and containment or process building leak rates).
 - b. Methodology for determining the type of hazard and source term is compatible with instrumentation/monitor values (e.g., engineering units, range, and conversion factors).
 - c. Instruments used for detection of chemical releases to the atmosphere have sufficient range to accurately determine the concentration of the released chemical(s) in air versus the chemical Protective Action Criterion (PAC).
 - d. Indicators that are not continually monitored (e.g., chemical analyses of fluids, contamination levels, etc.) are sampled to identify the particular indicators to be continually monitored to assess the consequences of potential events, in addition to occurring events, by identifying trends, relationships, etc., that would indicate degrading conditions.
- P/E11.12 Adequate meteorological information is obtained for use in transport and dispersion calculations to project the consequences of the hazardous material release to the environment, onsite and offsite.
- P/E11.13 Onsite and offsite receptors of interest are identified quickly and are readily available to emergency managers (e.g., receptor locations at the facility and site boundaries, to or beyond the EPZ boundary, and populations with special needs).
- P/E11.14 Consequence estimates for actual or potential releases of hazardous materials:
- a. Are made in a timely manner, efficiently, and accurately (i.e., consistent with the accuracy of the input data);

- b. Account for releases from ground level and elevated release points, or monitored and unmonitored pathways; make use of post-accident analysis results and field monitoring team data, as appropriate;
- c. Include calculations of radioactive dose or toxic chemical exposure for the external, inhalation, and ingestion pathways, as appropriate;
- d. Are provided for receptor locations at the facility and site boundaries, to or beyond the EPZ boundary, and for populations with special needs; and
- e. Use the appropriate facility-specific PAC, which is identified and readily available to consequence assessment teams for estimating health effects at a specified distance from the event.

Field Measurements

- P/E11.15 Field teams receive initial, conservative estimates of projected consequences in a timely manner prior to being dispatched for sampling, monitoring, and plume tracking activities.
- P/E11.16 Field sampling and monitoring activities are used to verify, update, and refine the source term and projected consequences through coordination with those responsible for consequence estimates.
- P/E11.17 Field teams (i.e., radiological and non-radiological field teams) successfully accomplish field monitoring and plume tracking within and beyond the EPZ, and, similarly, verify the absence of consequences in specific areas.
- P/E11.18 As available, data from environmental monitoring programs is used to support consequence assessment, including data from installed air monitors, area radiation monitors, and in-plant surveys.

Coordination

- P/E11.19 Effective coordination is established with Federal, Tribal, State, and local organizations to estimate the impact of the release on the public and the environment, locate and track hazardous materials released, and locate and recover materials, especially those with national security implications.
- P/E11.20 Field monitoring and data collection by facility and site teams, State and local teams, and Federal teams is coordinated to facilitate exchanges and correlation of information.
- P/E11.21 Assessments and analyses are clearly communicated to offsite emergency management decision makers.

- a. Engineering units used in facility/site consequence assessment are understood and compatible with the units used by offsite emergency response authorities.
- b. Differences in modeling methods are well understood by onsite and offsite emergency response personnel.

Evaluation Criteria [PROGRAMMATIC Functions]:

P11.22 A formal Quality Assurance Program is implemented and maintained for control of the tools used in consequence assessment, such as the meteorological monitoring system hardware and software and dose modeling hardware and software.

D.4.7 Protective Actions and Reentry

Performance Goal:

Protective actions are promptly and effectively implemented or recommended for implementation, as needed, to minimize the consequences of emergencies and to protect the health and safety of workers and the public. Protective actions are implemented individually or in combination to reduce exposures to a wide range of hazardous materials. Protective actions must be reassessed throughout an emergency and modified as conditions change. Reentry activities must be planned, coordinated, and accomplished properly and safely.

Evaluation Criteria:

Protective Action Decision-Making

- P/E12.1 All emergency response activities, including search and rescue, incident mitigation activities, field monitoring, and reentry, are planned and controlled with a focus on health and safety of emergency responders within pre-planned protective action exposure guidelines.
- P/E12.2 Applicable PACs are used in protective action (e.g., sheltering, evacuation) decision-making for the actual or potential release of hazardous materials to the environment.
- a. For radioactive materials, Protective Action Guides (PAGs), promulgated by the Environmental Protection Agency (EPA), are used.
 - b. Listed in order of preference, PACs used for toxic chemicals are: Acute Exposure Guideline Levels (AEGs), promulgated by the EPA; Emergency Response Planning Guidelines (ERPGs), published by the American Industrial Hygiene Association; and Temporary Emergency Exposure Limits (TEELs), developed by DOE.

- c. For hazardous biological materials, PACs are considered exceeded and immediate protective actions are required for any actual or potential release of agents or toxins outside of secondary containment barriers. Long-term PACs are specified by State or local public health officials.
- P/E12.3 Protective actions reflect a conservative assessment of the level of health effect and extent of potentially affected/impacted area and populations.
- P/E12.4 The notification and implementation of onsite PAs and notification of offsite PARs are made in a timely, efficient, and unambiguous manner confirmed and monitored by the ERO.
- P/E12.5 Initial onsite PAs and offsite PARs are linked to facility-specific OE event classification criteria [i.e., EALs]
- P/E12.6 Initial onsite PAs and offsite PARs are linked to facility-specific biological OE event recognition and categorization criteria.
- P/E12.7 Protective actions are implemented individually or in combination to reduce exposures to a wide range of hazardous materials.
- P/E12.8 Modifications to initial protective actions are developed and implemented based on updated and refined data generated from the continuous consequence assessment process.
- P/E12.9 Decision makers consider other possible protective actions for onsite and offsite populations, such as thyroid blocking agent, chemical neutralizing agents, water and food intervention levels, transportation route access controls, and impromptu respiratory protection.
- P/E12.10 Onsite PA decision-making is coordinated with site organizations such as security and safety.
- a. Security and law enforcement measures implemented during a physical attack that impact worker and responder access and egress (e.g., lockdown) are coordinated with emergency management and site security.
 - b. The identification of necessary PPE is coordinated with emergency management and safety professionals, including industrial safety, industrial hygiene, health physics, and fire protection engineering.

Onsite - Protective Actions (PAs)

- P/E12.11 Plans are followed for the timely evacuation and/or sheltering of onsite personnel, along with provisions to account for employees after emergency evacuation has been completed.

- P/E12.12 Emergency evacuations for site personnel:
- a. Evacuation route selection and logistical details are implemented promptly and efficiently;
 - b. Multiple evacuation egress routes provide options based upon release type and wind direction;
 - c. Evacuation routes avoid hazards, are familiar to site personnel, and are coordinated with offsite authorities;
 - d. The reception/relocation center is sufficient to accommodate the expected number of personnel; and
 - e. Adequate personnel are assigned to control evacuees and are kept aware of changes in onsite protective action modifications.
- P/E12.13 Accountability in emergency evacuations for site personnel:
- a. Trained and assigned individuals assume and carry out responsibilities for building or facility accountability in the event of personnel evacuation;
 - b. Initial accounting for all evacuated personnel is completed in a timely manner to support initial search and rescue activities; and
 - c. Accountability is continued to support ongoing search and rescue activities following an emergency evacuation.
- P/E12.14 Provisions are implemented to protect workers, covered by 29 CFR 1910.120, involved in response and cleanup. This includes measures to ensure that security, fire, medical, and other response personnel are protected from exposure to hazards during the course of their movements while supporting response.
- P/E12.15 Habitability of onsite facilities, including emergency facilities, is periodically determined using dosimetry and survey instruments, and relocation/evacuation measures are taken, if necessary.
- P/E12.16 Actions that may be taken to increase the effectiveness of protective actions (i.e., HVAC shutdown during sheltering) are implemented in a timely and efficient manner.
- P/E12.17 Access to and egress from actual or potentially contaminated areas, or the site, is monitored and controlled.
- a. People, vehicles, and equipment are effectively monitored before leaving contaminated areas and the site, if possible, and also upon arrival at designated decontamination, relocation, or assembly areas.

- b. Sufficient staffing and equipment are available to activate designated monitoring locations.

P/E12.18 Emergency facilities, equipment, personnel, and implemented methods and criteria provide effective decontamination of personnel and equipment for various levels and types of contamination (e.g., skin contamination).

Offsite - Protective Action Recommendations (PARs)

P/E12.19 Timely PARs, such as sheltering, evacuation, relocation, and food control, are made to appropriate Tribal, State, or local authorities.

P/E12.20 Candidate PARs are coordinated with offsite authorities and well-defined geographic areas for sheltering and evacuation, special needs areas or special populations, and evacuation routes are readily available.

P/E12.21 Ingestion pathway PARs are formulated, when appropriate, and communicated to offsite authorities.

Reentry Activities

P/E12.22 Reentry and approval of extended dose or exposure limits is within the authority and responsibility of the ED.

P/E 12.23 Facility personnel estimate exposure to hazardous materials to protect workers and the public during reentry and recovery activities.

P/E12.24 Reentry activities are performed safely and efficiently, with specific team composition (e.g., minimum of one medically trained member) and equipment that accomplishes the mission.

P/E12.25 Reentry planning addresses the following: conduct of operations during reentry; range of hazardous materials which may be encountered; hazard control procedures; type and nature of potential safety failures; guidelines for prioritization of reentry activities; team selection, personnel safety, job planning, communications during reentry; record keeping; and provisions for backup to every reentry.

P/E12.26 Reentry planning includes contingency planning to ensure the safety of reentry personnel, such as planning for the rescue of reentry teams. The reentry plan must include a hazards/safety briefing, consistent with Federal, Tribal, State, and local laws and regulations, for all individuals involved in reentry.

P/E12.27 Exposure criteria are established and available for each type of reentry activity, including search and rescue, and repair. 10 CFR 835, Subpart N, limits are observed for radiological events, such as lifesaving, protection of

health and property, and recovery of deceased. Volunteers are used for high-risk situations.

- P/E12.28 Responders involved in reentry receive pre-reentry hazards/safety briefings prior to emergency response activities and post-reentry briefings consistent with Federal, Tribal, State, and local laws and regulations.

Record Keeping

- P/E12.29 Records of personnel exposures to hazardous materials (radioactive, chemical, and biological) are effectively controlled, monitored, and maintained.
- P/E12.30 Names of individuals surveyed, the extent of any contamination found, the instruments used and the methods employed, and results of any decontamination efforts are recorded.
- P/E12.31 Contaminated individuals are scheduled for follow-up actions (e.g., subsequent whole body counts and/or bio-assays).

D.4.8 Emergency Medical Support

Performance Goal:

Medical support for contaminated or injured personnel is planned and promptly and effectively implemented. Arrangements with offsite medical facilities to transport, accept, and treat contaminated, injured personnel are documented.

Evaluation Criteria [RESPONSE Functions]:

General

- P/E13.1 Provisions for response to emergency medical situations and medical treatment of injured personnel are implemented.
- P/E13.2 Medical treatment is provided for mass casualty situations (Cf. DOE O 440.1A).
- P/E13.3 Onsite personnel who respond to a medical emergency show proficiency in first aid or emergency medical treatment comparable with that of any offsite team employed and similarly equipped.
- P/E13.4 Employee medical records and treatment history are readily available and accessed as needed.
- P/E13.5 Onsite and offsite coordination:
- a. Treatment protocols are coordinated among onsite and offsite mutual aid response units.

- b. Offsite and onsite medical support services and capabilities are effectively integrated.
 - c. Standing orders/protocols ensure that patients are transported to the receiving facility best equipped to provide the appropriate level of care for the patient's condition.
 - d. Onsite and offsite medical communications systems are compatible and effective.
- P/E13.6 Ambulance crews initiate communications with receiving medical facilities while en route.
- P/E13.7 Procedures are in place in biosafety facilities that allow rapid and effective communications among public health officials, emergency rooms, law enforcement, and emergency management officials about unusual biological events.
- P/E13.8 During an event involving the release of hazardous biological material, medical personnel assume the role of primary responders. Medical personnel assist in release detection/confirmation, consequence assessment, and development of protective actions.
- P/E13.9 Security clearance issues do not impede medical treatment or transport of injured personnel.

Contaminated Injured

- P/E13.10 Medical support for contaminated or injured personnel is promptly and effectively implemented.
- P/E13.11 Appropriate recognition and emphasis is focused on medical treatment versus radioactive or chemical contamination for contaminated/injured personnel; proper and effective decisions are made.
- P/E13.12 Onsite and offsite medical facilities are outfitted and staffed to utilize specialized equipment and supplies specific to onsite hazards.
- P/E13.13 Immediate, effective onsite first aid and emergency medical treatment is provided for injured workers, including those with hazardous material contamination:
- a. Onsite radiation protection, industrial hygiene personnel, and infectious disease specialists are properly equipped to assist medical and Emergency Medical Service (EMS) staff in performing patient survey, decontamination, contamination and exposure control, urine and fecal analysis, and in-vivo counting methods.

- b. Proper contamination control procedures are implemented in handling injured and contaminated personnel; and
- c. Decontamination facilities are available and adequately equipped.

P/E13.14 Personnel, vehicles, facilities, and equipment are adequate for treating and transporting injured, contaminated, or exposed individuals in a safe and effective manner.

- a. Onsite and offsite medical and emergency medical technician personnel use required equipment for assessing patient conditions, including PPE and medical service protective clothing;
- b. Exposure and contamination information is sent with victims, and expert technical support is provided to the receiving hospital(s); and
- c. The site takes responsibility for removal of contaminated material in offsite medical facilities or vehicles.

P/E13.15 Additional medical assistance and treatment procedures, and associated points of contacts, are accessed, as necessary, including: search and rescue resources, REAC/TS assistance, Public Health Service coordination, long-term longitudinal health testing, chelation, handling contaminated remains, and other sophisticated medical procedures.

Evaluation Criteria [PROGRAMMATIC Functions]:

P13.16 Arrangements with offsite medical facilities to transport, accept, and treat contaminated, injured personnel are established, documented, and periodically reviewed.

P13.17 The sharing of patient information between onsite and offsite health care providers during emergencies, consistent with the requirements of Health Insurance Portability and Accountability Act of 1996 (42 USC 300), is coordinated in advance.

P13.18 Onsite and offsite medical personnel are offered information and training on facility-specific hazardous materials and offered opportunities for participation in drills and exercises.

P13.19 Biosafety surveillance plans for detecting unusual medical events are established onsite and specific responsibilities for surveillance and reporting are identified. The veterinary profession is involved in surveillance activities, as appropriate. Key indicators and medical surveillance baselines for agent/toxin are effectively implemented.

P13.20 An information system is installed at biosafety facilities for patient monitoring, management, and tracking.

- P13.21 Key indicators and medical surveillance baselines for facility-specific agents/toxins are provided to offsite medical surveillance programs for detecting unusual medical events that may have resulted from a release at a DOE/NNSA biosafety facility.

D.4.9 Emergency Public Information

Performance Goal:

Emergency Public Information (EPI) provides accurate, candid, and timely information to workers, news media, and the public during an emergency to establish facts and avoid speculation. EPI efforts are coordinated with DOE and NNSA (if appropriate); Tribal, State, and local governments; and Federal emergency response organizations, as appropriate. Workers and the public are informed of emergency plans and planned protective actions before emergencies.

Evaluation Criteria [RESPONSE Functions]:

General

- P/E14.1 Information distributed by EPI to workers, site personnel, and the public during an OE is:
- a. Accurate, candid, and understandable;
 - b. Current and timely;
 - c. Provided to ensure the health and safety of workers and the public;
 - d. Provided to establish facts, and avoid rumors and speculation;
 - e. Responsive to public concern and information needs; and
 - f. Consistent with the requirements of the Freedom of Information Act and the Privacy Act.
- P/E14.2 The Cognizant Field Element public affairs director or his designee, responsible for EPI review and dissemination, approves initial news releases or public statements.
- P/E14.3 Following initial news releases and public statements, updates are coordinated with the DOE/NNSA Cognizant Field Element public affairs director and the HQ ED.

Functions/Staffing

- P/E14.4 Functions and staff of the EPI organization:

- a. Functions of the EPI during an OE response include information collection, coordination, production, dissemination, and monitoring and analysis of media coverage, public concerns, and information needs.
 - b. Functions and staffing are consistent with the nature, severity, duration, and public and media perception of the event or condition.
 - c. Trained spokespersons provide support in media interface.
 - d. A news writer and other trained personnel provide support in media services, public inquiry, media inquiry, management and administrative services, and media monitoring.
- P/E14.5 Rumors and misinformation are detected, controlled, and corrected; accurate information disclaiming rumors and correcting misinformation is incorporated in media briefings and press releases as necessary.
- P/E14.6 Communications with the media and public are timely and responsive to public concerns.
- a. Information released to the public through the news media regarding the emergency is accurate and relevant.
 - b. An initial press statement is released as soon as possible, but within one hour of event categorization.
 - c. Frequency and content of news conferences are consistent with information needs of the public and media.
 - d. Press briefings are held with regular frequency and whenever new or breaking information is available concerning emergency conditions, protective actions, or response.
 - e. Technical briefers are utilized and are knowledgeable and effective in communicating with the news media.
- P/E14.7 EPI staff is proactive in obtaining emergency information from the facility command center or EOC.
- P/E14.8 Medical personnel associated with the biosafety program are involved in the development of materials to be used in news releases to ensure that characterization of the hazard is conveyed accurately.
- P/E14.9 Public announcements in areas involving classified information or unclassified controlled information:

- a. The appropriate official (e.g., DC) reviews news releases or announcements before release to the public to ensure that no information is provided that may present a security risk.
- b. Sufficient publicly releasable information is provided to adequately explain the emergency response and protective actions required for the health and safety of workers and the public.

Joint Information Center (JIC)

P/E14.10 The JIC is established, directed, and coordinated by a senior DOE or NNSA Cognizant Field Office public affairs manager or alternate.

P/E14.11 The designated JIC location:

- a. Is available, equipped, maintained and controlled to accommodate members of the news media, DOE, contractor, and offsite agency representatives, and to facilitate the preparation and coordination of emergency information release to the public through the news media.
- b. Provides adequate space, equipment, communications lines, security provisions, and information resources to accommodate personnel (both media and staff) and to accomplish required functions.

P/E14.12 JIC functions and staffing:

- a. The JIC is adequately staffed with personnel trained to serve as spokesperson and news writer.
- b. Persons with technical expertise related to the emergency and with spokesperson training are assigned to the JIC.
- c. Personnel are assigned to the JIC to provide support in media services, public inquiry, media inquiry, JIC management and administrative activities, and media monitoring.
- d. The JIC supports response to public inquiries in a timely manner.
- e. The JIC has provisions in place to detect, correct, and control rumors and misinformation.

P/E14.13 An alternate JIC is available in the event that the primary JIC becomes uninhabitable.

P/E14.14 JIC access control is adequate and there is a means to readily identify media representatives and staff.

- P/E14.15 Prepared relevant information concerning affected facilities, emergency plans, hazards, and logistics is provided to news media in the JIC.
- P/E14.16 Appropriate visual aids are available and utilized for briefing news media regarding events, impacted areas, consequences and protective actions.

Offsite Coordination

- P/E14.17 The management team and outside agency representatives effectively, openly, and readily share and coordinate information.
- P/E14.18 An EPI communications system is established among DOE/NNSA HQ, the Cognizant Field Element, and on scene locations.
- P/E14.19 Public information functions and efforts during the emergency are coordinated with DOE HQ, other Federal agencies, and Tribal, State, and local government organizations and are a part of Federal emergency response plans, as appropriate.
- P/E14.20 Information (written and verbal) that is to be released to the news media is coordinated with DOE, and other Federal, state, tribal and local response organizations, as appropriate.
- P/E14.21 The DOE/NNSA Cognizant Field Office public affairs director and HQ ED are notified of all DOE/NNSA emergency public information actions. These notifications are made as soon as practicable.
- P/E14.22 A public information officer is assigned to a facility/site or activity emergency response team deployed offsite to provide mutual aid to a significant response.

Evaluation Criteria [PROGRAMMATIC Functions]:

- P14.23 An EPI Plan, which can cover more than one facility on a site, provides the following:
- a. Identification of personnel, resources, facilities, and coordination procedures necessary to provide emergency public information;
 - b. Training and exercises for personnel who will interact with the media;
 - c. A methodology for informing workers and the public of DOE/NNSA emergency plans and protective actions, before and during emergencies;
 - d. Coordination of public information efforts with local, State, and Tribal governments, and Federal emergency response plans, as appropriate.
- P14.24 The EPI program has provisions for establishing a media center to operate as the single source of information during an OE. [A media center is a

designated location where the DOE/NNSA Cognizant Field Element and contractor personnel can conduct the necessary briefings and press conferences regarding an OE at the facility.]

- P14.25 For Hazardous Material Program facilities/sites, the EPI program has provisions to establish a Joint Information Center (JIC), where multiple jurisdictions gather, process, and disseminate public information during an OE.
- P14.26 The EPI program is integrated with facility/site emergency management program plans and procedures.
- P14.27 Prior to emergencies, workers and site personnel are informed of emergency response plans, response capabilities, and planned protective actions.
- P14.28 Continuing education is provided to the area news media for the purpose of acquainting media with the facility, management personnel, facility/site hazards, emergency plans, and points of contact.
- P14.29 In coordination with Tribal, State and local governments, information is disseminated periodically to the public regarding facility hazards, how they will be alerted and notified of an emergency, what their actions should be in the event of an emergency, and points of contact for additional information.
- P14.30 Internal and external organizational relationships for EPI are documented and maintained in the public information program.
- P14.31 A list of 24-hour media points-of-contact is available and maintained current.

D.4.10 Termination and Recovery

Performance Goal:

An OE is terminated only after a predetermined set of criteria has been met and termination has been coordinated with offsite agencies. Recovery from a terminated OE includes: communication and coordination with Tribal, State, and local government and other Federal agencies; planning, management, and organization of the associated recovery activities; and ensuring the health and safety of the workers and public.

Evaluation Criteria:

Termination

- P/E15.1 The decision to terminate emergency response for an OE is made by the site ERO and is coordinated with all principle participating response organizations (i.e., local, State, Tribal, DOE HQ, other participating Federal agencies). Internal and external communications that are associated with termination are performed.

- P/E15.2 The decision to terminate an OE not requiring classification formally announces or acknowledges that the situation is stabilized and that the response activity is ending or has been substantially scaled back. Termination criteria are observables associated with the event/condition.
- P/E15.3 The decision to terminate an OE requiring classification is based on the need for the ERO to remain fully active to monitor and manage the situation and is a declaration that a decision has been reached that the full ERO is no longer needed and the ERO may now begin to reduce its support. The termination criteria represent decision criteria to be satisfied.
- P/E15.4 An approved, predetermined set of criteria for terminating an OE requiring classification [e.g., an airborne release of (or loss of control over) hazardous material] is met. Selected termination criteria may include the following:
- Recovery plan is developed
 - Recovery staff is identified
 - Event scene/facility is in stable condition
 - Event scene/facility is isolated and can be preserved
 - Resources are available to begin recovery activities
 - All releases of hazardous materials are ended or below level of regulator concern
 - Accountability of all personnel is complete
 - Contaminated areas are identified, isolated and secured
 - All injured and contaminated personnel have been treated and transported
 - Notification of next-of-kin of victims
 - Protective actions have been adjusted according to extended conditions
 - Recovery manager and staff have been fully briefed by the Emergency Director
 - Notifications are made to DOE, other Federal, Tribal, State, and local response organizations.
- P/E15.5 An approved, predetermined set of criteria for terminating an OE not requiring classification are met. Selected **general** termination criteria that apply may include the following:

- Recovery plan is developed
- Recovery staff is identified
- Event scene/facility is in stable condition
- Event scene/facility is isolated and can be preserved
- Resources are available to begin recovery activities
- Next-of-kin of victims have been notified
- Recovery manager and staff have been fully briefed by the ED
- Notifications are made to DOE/NNSA, other Federal, Tribal, State, and local response organizations.

P/E15.6 Additional OE-specific criteria for emergencies not requiring classification are met.

P/E15.7 Termination criteria for a hazardous biological material release OE are similar to criteria for an OE that requires classification, such as the release of toxic or radioactive materials. The decision to terminate a biological OE is based on the perceived need for the ERO to remain fully active to monitor and manage the situation. Termination is a declaration that a decision has been reached that the full ERO is no longer needed and the ERO may now begin to reduce its support.

P/E 15.8 Facility personnel estimate exposure to hazardous materials to protect workers and the public during reentry and recovery activities.

Recovery

P/E15.9 Prior to terminating the emergency response, the site ERO establishes the recovery organization and determines the resources needed to begin recovery operations.

P/E15.10 The beginning of the recovery phase is marked by the termination decision and subsequent notifications that an event no longer constitutes an OE.

P/E15.11 The recovery plan to return the affected facility/area to normal operations following the termination of the OE is developed by the recovery organization, and depends on (i.e., is commensurate with) the severity and nature of the emergency event or condition.

P/E15.12 The plan and recovery organization address the following areas, as needed:

- Dissemination of information to Federal, Tribal, State, and local organizations regarding the emergency and possible relaxation of protective actions;
- Notifications associated with termination;
- Accident assessment and investigation;
- Recovery planning and scheduling;
- Establishment of a recovery organization;
- Repair and restoration;
- Planning for cleanup and decontamination;
- Waste management;
- Regulatory (e.g., environmental) compliance;
- Security;
- Crime scene investigation;
- Communication and notifications;
- Development and approval of recovery procedures;
- Repair or replace emergency equipment, replenish consumables;
- Health and safety (e.g., medical follow-up planning);
- Reporting requirements; and
- Criteria for the resumption of normal operations.

P/E15.13 Accident assessment and investigation are performed, consistent with event severity, including root cause analysis, accident reporting, event documentation collection, assessment of facility condition, and assessment of contamination effects, if relevant.

P/E15.14 Root cause(s) of the emergency are investigated and corrective action(s) to prevent recurrence are developed according to Departmental requirements.

P/E15.15 Recovery activities are coordinated with Federal, Tribal, State, local and other agencies, and are in compliance with their requirements.

APPENDIX E. Systematic Approach for Performing Self-Assessments of Emergency Management Programs

The purpose of this appendix is to provide guidance for the development and conduct of *systematic* self-assessments of emergency management programs. DOE O 151.1C requires DOE/NNSA facility/site managers to establish and maintain an internal assessment program, including developing and conducting self-assessments, to provide assurances of the readiness of emergency response capabilities. The emergency management program administrator at each facility/site is responsible for developing self-assessment programs and for implementing them according to a predetermined schedule. The Cognizant DOE/NNSA field element manager is required to review contractor self-assessment programs annually to ensure compliance with DOE/NNSA directives and policies.

Typically, emergency management self-assessment has been considered a single internal assessment or self-evaluation event. On the other hand, a *systematic* self-assessment approach is a continuous assessment process and is based on the understanding that emergency management includes a set of routine functions and activities that must be maintained on an ongoing basis for *readiness assurance*. *Systematic* self-assessment provides a holistic assessment of these functions and activities to help maintain and sustain emergency management programs.

This appendix describes an approach for ongoing evaluation of contractor emergency management programs. Evaluation is executed through a scheduled self-assessment program, consisting of individual self-assessment activities that are accomplished throughout the year. These assessment activities should focus on a full range of emergency management functions and areas. Results of these activities provide information that management can use in assessing overall program readiness and effectiveness. Assessment activities carried out over the annual assessment period support program managers in maintaining a state of program readiness. Performance data from these activities contribute to trending and analyses that focus management attention and resources on areas of greatest need.

Some self-assessment activities may occur once a year, while others will be assessed more frequently to ensure that timely corrective actions contribute to program improvement. For example, one type of self-assessment activity is emergency response facility tours and equipment tests. These are designed to verify the state of readiness of the Emergency Response (ER) facilities. It may be appropriate to conduct this self-assessment activity at some sites through monthly visual inspections and more frequently at other sites. Other assessment activities will occur on a random basis, for example, the conduct of a no-notice exercise or a management tour of a facility. Additionally, when emergency response teams are activated to respond to an actual emergency the effectiveness of that response should be self-assessed and the results factored into the annual program assessment.

The *systematic* self-assessment approach suggests an annual management review of the results of the self-assessment activities, including emergency management performance trends and data concerning performance problems and their causes. Section E.3 of this appendix provides a suggested approach for an annual Management Review of the emergency management program.

E.1 Overview of an Emergency Management Self-Assessment Model for DOE/NNSA Sites

Following are generic examples that illustrate a systematic approach to emergency management program self-assessment. Self-assessment activities should be conducted at a minimum annually but staggered so that assessment is ongoing and trending of performance data can be spread over the annual assessment period. Section E.1.1 lists potential self-assessment activities and an approach for documenting their conduct. Section E.1.2 illustrates an example schedule of such activities.

E.1.1 Annual Self-Assessment Activity Summary

The following table is an example summary of self-assessment activities scheduled for the year:

<u>Self-Assessment Activity</u>	<u>Scheduled</u>	<u>Date Completed</u>	<u>Name of Assessor</u>
Hazards Survey (HS)/ Emergency Planning Hazards Assessment (EPHA) Review	_____	_____	_____
HS/EPHA Facilities Tour	_____	_____	_____
Emergency Response Organization (ERO) Qualification review	_____	_____	_____
ERO Quarterly Drill	_____	_____	_____
ER Plans/Procedures Review	_____	_____	_____
ER Facilities Tour and Equipment Test	_____	_____	_____
Communications Test	_____	_____	_____
ER Drill Program Review	_____	_____	_____
Corrective Action Timeliness Review	_____	_____	_____
Training Documents Review	_____	_____	_____
Offsite Interface Review	_____	_____	_____
Training Effectiveness Review	_____	_____	_____

E.1.2 Emergency Management Program Management Schedule

By staggering the conduct of self-assessment activities throughout the year, emergency management program managers can use the self-assessment activities to evaluate system health throughout the year. To accomplish this effectively, self-assessment activities can be included in a Program Management schedule. A program management schedule is a simple management tool that supports the manager in planning, monitoring and maintaining the program. Managers should establish and document in advance a calendar of assessment activities that are to be carried that year. The program manager should ensure that assessments are carried out, regularly review the results, and track trends to determine program progress toward meeting performance goals. The following

is a simplified example of a schedule focusing on assessment activities throughout the year.

Sample **Program Management Schedule**

	<u>Scheduled</u>	<u>Conducted</u>
<u>January:</u>		
HS/EPHA Facility Tour	_____	_____
ERO Drill Program Review	_____	_____
Communications Test	_____	_____
<u>February:</u>		
ER Facilities Tour and Equipment Operability Test(s)	_____	_____
ERO Training Effectiveness Review (Conducted by training group)	_____	_____
<u>March:</u>		
Annual <i>Internal Program Evaluation</i>	_____	_____
HS/EPHA Facility Tour	_____	_____
ERO Quarterly Drill	_____	_____
HS/EPHA Review	_____	_____
<u>April:</u>		
No-Notice Exercise	_____	_____
ER Facilities Tour and Equipment Operability Test(s)	_____	_____
Communications Test	_____	_____
Corrective action timeliness review	_____	_____
<u>May:</u>		
<i>Management Review of Program</i>	_____	_____
HS/EPHA Facility Tour	_____	_____
ER Drill program Review	_____	_____
<u>June:</u>		
ER Facilities Tour and Equipment Operability Test(s)	_____	_____
ERO Qualification Review	_____	_____
Offsite Interface Review	_____	_____
ERO Quarterly Drill	_____	_____
<u>July:</u>		
HS/EPHA Facility Tour	_____	_____
ERO Training Effectiveness Review	_____	_____
Training Documents review	_____	_____
<u>August:</u>		

ER Facilities Tour and Equipment Operability Test(s)	_____	_____
Communications Test	_____	_____

September:

HS/EPHA Facility Tour	_____	_____
<i>Annual Exercise</i>	_____	_____
ERO Quarterly Drill	_____	_____

October:

ER Facilities Tour and Equipment Operability Test(s)	_____	_____
Communications Test	_____	_____

November:

HS/EPHA Facility Tour	_____	_____
Corrective action timeliness review	_____	_____

December:

ER Facilities Tour and Equipment Operability Test(s)	_____	_____
ER Plans/Procedures review	_____	_____
ERO Quarterly Drill	_____	_____

E.2 Example Self-Assessment Activities

The remaining sections of this appendix describe some (not all) of the self-assessment activities that are listed above. The conduct of other assessment activities, such as ERO drills, communications tests, training documents review and corrective action timeliness review, are either described in other chapters of the DOE G 151.1-series, *Emergency Management Guide* (EMG), or should be self-evident to program managers. The following selected examples are intended to convey representative content for the self-assessment activities indicated.

E.2.1 Hazards Survey and Hazards Assessment Facilities Tour

A periodic assessment of the accuracy of facility HS and EPHA is a critical self-assessment function. Qualified personnel should be assigned to conduct reviews, including walk-down of facilities to ensure that changes to facilities are noted, evaluated, and incorporated to correct HS and EPHA documents. Action items should be entered into the organization’s corrective action program and tracked to completion to ensure the currency of these documents. Results should also be included as part of the self-assessment activity. The following table contains a sample form to use for a facility tour that focuses on the current validity of the EPHA and Sample Assessment Form for a HS/EPHA Facilities Tour

Individual conducting the tour: _____

Date and time of the tour: _____

Facilities and areas toured: (list areas toured)

Checklist of observation points prior to and during the tour:

- HS and EPHA assessment documents (if applicable) for assigned facility was reviewed before tour.
- Hazardous materials inventories documents were reviewed prior to tour
- Inventories of hazardous materials observed during tour
- Hazardous material storage conditions
- Hazardous material use conditions
- Energy sources
- Facility boundary
- External hazards
- Transportation hazards
- Engineered controls, safeguards/safety systems
- Administrative controls
- System barriers
- System controls and protection features

Tour conclusions

- The facility was toured and conditions and controls remain as stated in the HS/EPHA
- The facility tour was satisfactory; however the assessor noted the following minor discrepancies from the HS/EPHA.
- The facility tour was not satisfactory. Significant discrepancies were noted from the HS/EPHA. (Notify the Emergency Management Department Manager immediately)

Tour Findings

List findings below and be as descriptive as possible.

E.2.2 Emergency Response (ER) Drill Program Review

The emergency management drill program should be included in the annual exercise program (for evaluated drills) or training and drills program (for training drills) and conducted in accordance with facility procedures. Results of evaluated drills should be captured in critiques that identify personnel, procedure and equipment deficiencies as well as recommendations for improvement and lessons learned. Action items generated by the critiques should be entered into the organization's corrective action program and tracked to completion. Results should be included as part of the self-assessment activity. The drill program should also be assessed in the annual internal evaluation.

Sample form for **ER Drill Program Review**

Individual conducting Drill Program Review:

Date of Review:

Drill records reviewed:

Drill Title:

Date of drill:

Records reviewed:

Drill conducted as scheduled

Scenario is used

Drill objectives are clearly documented

Critique documents drill results and lessons learned

Personnel and equipment problems are documented in corrective action system

Corrective and preventive actions are tracked to completion

Drill participants are documented

E.2.3 Offsite Interface Review

Program managers should ensure that communications that interface with offsite organizations, especially those that support the DOE or NNSA site's emergency response, are received, documented and responded to. Further guidance for program implementation is provided within the EMG. Internal review of the offsite interface program should be performed as part of the annual internal program evaluation using evaluation criteria presented in this guide. This should include review of the effectiveness of any training that the site provides for offsite organization personnel. (See Training Effectiveness Review below)

To ensure that communications and interface issues are effective throughout the year, program managers may choose to have these external interface activities reviewed more frequently and trend results as part of self-assessment.

E.2.4 ERO Qualification Review

Program managers should ensure that a review of ERO qualifications be conducted periodically to ensure that response personnel are current with regard to training, qualification, re-qualification and emergency drill/exercise participation. ERO training requirements and corresponding personnel training records are used to conduct this review. The results should be included as part of the self-assessment record.

E.2.5 Training Effectiveness Review

Periodically, qualified individuals should conduct a comprehensive evaluation of individual training programs to identify program strengths and weaknesses. This should include:

- Evaluation of instruction setting, materials, and instructor performance
- Feedback from trainee performance during training
- Feedback from former trainees and their supervisors
- Change actions are monitored and evaluated for their applicability to development or modifications of initial and continuing training programs, and change is incorporated in a timely manner
- Improvements and changes to initial and continuing training are systematically initiated, evaluated, tracked and incorporated to correct training deficiencies and performance problems.
- Changes to job scope are evaluated to determine need for development or modification of initial and continuing training programs
- Subcontracted training is evaluated for its contribution to meeting job performance requirements and to ensure that its quality is consistent with the facility training standards.

The results should be included as part of the self-assessment activity

E.2.6 Emergency Response (ER) Facilities Tour and Equipment Operability Test

Assessment and trending of emergency response facilities and equipment performance relies upon the output of drill and exercise critiques, operability tests, and facility tours to identify potential issues to the corrective action program database. Program managers should review data from these sources annually to determine if trends in performance can be ascertained. Documentation of the results regarding resultant findings or trends should be documented as part of the self-assessment activity record.

Following is an example of assessment activity related to facilities and equipment, an ER Facilities Tour reference checklist.

Sample Form

Emergency Response Facilities Tour and Equipment Operability Test

This form can be used as a reference guide while conducting a tour of one or more emergency response facilities. Significant findings or action items should be entered into the organization's corrective action program and tracked to completion to ensure facility readiness. Results should also be included as part of the self-assessment activity.

Individual conducting the tour: _____

Date and time of the tour: _____

Facilities and areas toured: (list areas toured)

Weekly tour

Emergency operations center
Operational support center
Control room

Monthly tour

Joint information center
Remote shutdown station
Alternate EOC

Checklist of observation points during the tour:

- Ingress/egress points of facility clear of obstructions
- Facility is secured
- Cleanliness of facility
- Normal and emergency lighting OK
- Status boards are clean and ready for use
- Facility furnishings intact
- Procedure binders are in place at appropriate positions
- Visual aids/displays are in place
- Facility equipment fully in place and appears operational (note: this is not a substitute for communications tests)
- Clocks/chronological displays are in place and reading properly
- Computer displays appear to be functioning properly (note: this is not a substitute for equipment test programs)
- Communications systems appear to be functioning properly (note: this is not intended to be a substitute for communications testing programs.)
- Administrative controls
- System barriers
- System controls and protection features

Tour conclusion

- The facility was toured and conditions and controls support activation
- The facility tour was satisfactory & activation is supported, however the assessor noted the following minor discrepancies.
- The facility tour was not satisfactory. Significant discrepancies were noted. (Notify the Emergency Management Department Manager immediately)

*Tour Findings**List findings below and be as descriptive as possible:***E.3 Annual Management Review**

Management should review the emergency management program at least annually to ensure its continuing suitability, adequacy, and effectiveness. The review should include assessment of opportunities for improvement and the need for changes to the emergency management program. The management review can examine the following types of information:

- Results of internal and external audits, evaluations, and assessments
- Results of emergency exercises performed
- Results of investigation of emergency response to actual events
- Feedback from interested parties, including offsite agencies, local public, site and field office management, other site departments
- Results of emergency management self-assessment components
- Status of corrective and preventive actions for emergency management
- Follow-up actions from previous management reviews
- Results of reviews of HSs and EPHAs
- Results of performance trending associated with emergency management
- Results of training effectiveness review
- Results of offsite interface review
- Changes at site that could affect the emergency management program
- Recommendations for improvement

Output from the management review should include any decisions and actions related to:

- Improvement of the effectiveness of the program and its processes
- Changes to the program or its processes
- Resource needs

Records from the management review should be maintained, including the persons participating in the review.