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Field Exercise Programs Assuring Department of the Army Preparedness for Chemical Emergencies: A Comparison with Federal Emergency Management Agency Programs

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LISTS OF ACRONYMS

Army Acronyms Only

AAR	after action report
AMC	U.S. Army Materiel Command
AMCCOM	U.S. Army Armament, Munitions, and Chemical Command
AMCSFA	U.S. Army Materiel Command Surety Field Activity
ANAD	Anniston Army Depot
APG	Aberdeen Proving Ground
AR	Army regulation
CAI	chemical accident/incident
CAIRA	chemical accident/incident response and assistance
CSDP	Chemical Stockpile Disposal Program
CSEPP	Chemical Stockpile Emergency Preparedness Program
CSM	chemical surety material
DA	Department of the Army
DESCOM	U.S. Army Depot Systems Command
DPG	Dugway Proving Ground
IRF	initial response force
LBAD	Lexington-Bluegrass Army Depot
MOU	memorandum of understanding
MSC	major subordinate command
MSEL	master scenario events list
NAAP	Newport Army Ammunition Plant
PAO	public affairs officer
PBA	Pine Bluff Arsenal
PUDA	Pueblo Depot Activity
SMR	surety management review
SOI	surety and operational inspection
SRF	service response force
SRFX (_ _)	service response force exercise (-year of exercise)
TEAD	Tooele Army Depot
TECOM	U.S. Army Test and Evaluation Command
UMDA	Umatilla Depot Activity
USADACS	U.S. Army Defense Ammunition Center and School

FEMA Acronyms Only

ARCA	area requiring corrective action
CFR	Code of Federal Regulations
DHHS	U.S. Department of Health and Human Services
DOC	U.S. Department of Commerce
DOD	U.S. Department of Defense
DOE	U.S. Department of Energy
DOI	U.S. Department of the Interior
DOT	U.S. Department of Transportation
EEM	exercise evaluation methodology

EOC	emergency operations center
EOF	emergency operations facility
EPA	U.S. Environmental Protection Agency
EPZ	emergency planning zone
FEMA	Federal Emergency Management Agency
FRPCC	Federal Radiological Emergency Preparedness Coordinating Committee
GM	guidance memorandum
NRC	U.S. Nuclear Regulatory Commission
RAC	Regional Assistance Committee
REP	radiological emergency preparedness
USDA	U.S. Department of Agriculture

**FIELD EXERCISE PROGRAMS ASSURING DEPARTMENT OF THE
ARMY PREPAREDNESS FOR CHEMICAL EMERGENCIES:
A COMPARISON WITH FEDERAL EMERGENCY
MANAGEMENT AGENCY PROGRAMS**

1 INTRODUCTION

1.1 PURPOSE AND SCOPE OF REPORT

This report examines planning and coordination processes used by the Department of the Army (DA) in conducting service response force (SRF) and other chemical surety material (CSM) exercises. The policies and practices of these Army exercise programs are compared with those used by the Federal Emergency Management Agency (FEMA) in conducting radiological emergency preparedness (REP) exercises. The report identifies areas where Army and FEMA exercise programs are similar and areas where they differ significantly.*

An examination of all of the exercise practices used by DA and FEMA is beyond the scope of this report. The Army's SRF exercise activity was selected for analysis because it represents the largest and most comprehensive chemical surety material exercises the DA regularly conducts. SRF exercises are extensive tests of on-post and off-post response capabilities to chemical accidents or incidents. Smaller-scale CSM exercises are also analyzed. Similarly, FEMA's REP exercise program is examined because it is a successful model of how large-scale field exercises are conducted to test state and local capabilities to respond to emergencies at commercial nuclear power plants. The programs addressed in this report are therefore prominent examples from two organizations with extensive experience in planning and conducting large-scale field exercises. Information gained from examining and comparing these programs can provide insight into how an integrated field exercise capability can be developed for the Army's CSEPP.

1.2 CHEMICAL STOCKPILE PROGRAMS AND EXERCISES

This section briefly describes the Chemical Stockpile Disposal Program (CSDP), the Chemical Stockpile Emergency Preparedness Program, the significance of exercises generally and for the CSEPP, and the current exercise planning strategy for the CSEPP.

*The research and interviews forming the base of this report were conducted in 1989. An exercise capability for the Chemical Stockpile Emergency Preparedness Program (CSEPP) is under development as this is published and will be pilot-tested at the DA's Service Response Force Exercise (SRFX)-91, an exercise to be conducted in Tooele, Utah. Army and FEMA programs have already evolved beyond some of the characterizations contained in this document, which is intended to provide historical perspective on the evolution of the respective programs. Such a perspective can in turn supply insight into how joint, integrated DA/FEMA exercise program strategies and activities may further evolve.

1.2.1 Chemical Stock pile Disposal Program

The Army's first CSDP Concept Plan was submitted to Congress in March 1986, as described in Ref. 1. The plan outlined the Army's proposed strategy for disposing of obsolete and unserviceable chemical munitions located at eight storage sites within the continental United States. Public Law (PL) 99-145 established a destruction milestone of September 30, 1994. This milestone was extended by PL 100-180, the National Defense Authorization Act of 1988-1989. Following the January 1988 issuance of the "Final Programmatic Environmental Impact Statement (FPEIS) for the Chemical Stockpile Disposal Program," the Army selected on-post incineration as the preferred alternative for destruction of the stockpile.

1.2.2 Chemical Stockpile Emergency Preparedness Program

As part of a strategy to mitigate potential environmental impacts of the storage and planned destruction of chemical agents, the Army has undertaken to upgrade on-post and off-post emergency preparedness at the eight storage and disposal locations in the continental United States. The emergency planning and preparedness upgrades will be implemented under the Chemical Stockpile Emergency Preparedness Program.

To implement various components of the CSEPP, the Army and the Federal Emergency Management Agency entered into a memorandum of understanding (MOU) establishing the roles and responsibilities of both entities.² The lead DA office for the CSEPP is the Chemical Demilitarization Agency, Office of the Assistant Secretary of the Army for Installations, Logistics, and the Environment. FEMA's lead office is the Technological Hazards Division, Office of Natural and Technological Hazards, State and Local Programs Support Directorate.

1.2.3 Exercises and the CSEPP

The planning document for the CSEPP provides "guidance and direction to local and state government officials in the development and maintenance of emergency plans for accidents or incidents involving stored lethal military chemical agents or disposal of these agents."³ The guidance document describes drills and three common types of exercises: the tabletop exercise, the functional exercise, and the full-scale exercise. Each of these types is described in some detail in Sec. 3.2.

In addition to other benefits, high-visibility field exercises can provide assurance to the public that the CSEPP is being implemented effectively. Short of an actual emergency response, well planned and coordinated exercises provide the best test of emergency preparedness capabilities and are an essential component of the CSEPP.

1.3 METHODOLOGY

We assembled the information contained in this report from a number of different sources. These sources include: (1) attendance at and participation in SRFX-89; (2) site visits to Pine Bluff Arsenal (PBA), the site of SRFX-89; (3) personal interviews conducted with personnel from the U.S. Army Materiel Command Surety Field Activity (AMCSFA) and the U.S. Army Defense Ammunition Center and School (USADACS); (4) personal interviews conducted with

state and local government officials in Arkansas during SRFX-89; (5) interviews with various FEMA regional personnel conducted during REP exercises; and (6) observations and expertise drawn from Argonne National Laboratory's experience over the past eight years providing REP program support to FEMA headquarters and regional offices.

1.4 REPORT ORGANIZATION

The remainder of this report is organized in five parts. Each part describes a separate exercise activity or aspect. Sections 2 through 5 contain subsections addressing the Army's CSM exercise program and the FEMA REP program. Sections 3, 4, and 5 contain a third subsection in which each activity or aspect of the DA exercise program is briefly compared with its counterpart in the FEMA exercise program.

Section 2 identifies the authority under which Army CSM and FEMA REP exercises are conducted and provides an overview of the exercise experience of each agency. Section 3 describes those activities and planning considerations that are typically addressed before an exercise begins. Section 4 describes activities or considerations that occur during an exercise; because a number of the pre-exercise activities carry forward into the exercise, this section is relatively brief. Section 5 reviews activities that occur after an exercise ends.

Finally, in Sec. 6, taking the most significant differences between the two programs, we summarize our recommendations for potential strategies the DA and FEMA can use in developing an integrated exercise program for the CSEPP.

2 EXERCISE AUTHORITY AND EXPERIENCE

2.1 EXERCISE AUTHORITY

This section describes the statutory, regulatory, or procedural authority under which Army CSM exercises and FEMA REP exercises are conducted. Exercise authority is important because it defines the framework within which exercises are conducted. An understanding of these authority structures is a positive first step toward the development and implementation of an integrated, full-scale exercise program.

2.1.1 DA Chemical Surety Material Exercise Program

Army Regulation (AR) 50-6, Nuclear and Chemical Weapons and Material: Chemical Surety, "prescribes policies, procedures, and responsibilities for the Chemical Surety Program." Chemical surety is defined as "those controls, procedures, and actions which contribute to the safety, security, and reliability of chemical agents . . ." Chemical surety material includes "chemical agents and their associated weapon systems, or storage and shipping containers that are either adopted or being considered for military use."

Section 5-5, Subsections c(4) and (5), of the AR (chemical accident and incident response and assistance) directs the Commanding General, Army Material Command (AMC), to "plan for, budget, and conduct a biennial exercise of the Army's SRF [Service Response Force]" and to "exercise at least every 18 months the CAIRA [Chemical Accident/Incident Response and Assistance] capability at each AMC installation having a chemical surety mission." Exercises conducted on the 18-month cycle are usually combined with and are an integral part of a surety management review (SMR), discussed later in this report.⁴

Subsection j(2) of AR Section 5.5 directs commanders of installations and organizations having missions involving the storage, handling, or use of chemical surety material to conduct quarterly chemical accident/incident (CAI) response and assistance exercises. These exercises involve the installation's entire Initial Response Force (IRF). Once each year, one of these quarterly exercises "should provide for testing of any existing plans with State and local or other supporting agencies."

As the CSEPP exercise strategy evolves, it will have to comply with the requirement in PL 100-456 in the sense that the destruction program be carried out with "maximum protection for the environment, the general public, and the personnel who are involved in the destruction of the lethal chemical agents and munitions..." While the exact meaning of this standard is uncertain, a strict interpretation could require that the off-post plans accomplish this level of public protection. If so, it may be incumbent on the DA to make sure that its exercise program results in sufficient information about the adequacy of these plans to determine if they provide maximum protection.

2.1.2 FEMA Radiological Emergency Preparedness Program

The FEMA responsibilities for radiological emergency preparedness are delineated in 44 Code of Federal Regulations (CFR) part 350⁵ and include, in summary:

Taking the lead in off-site emergency planning and in the review and evaluation of state and local government emergency plans for adequacy.

Determining whether the plans can be implemented on the basis of observation and evaluation of exercises conducted by emergency response jurisdictions.

Coordinating the activities of volunteer organizations and other involved federal entities such as U.S. Department of Agriculture (USDA), U.S. Department of Commerce (DOC), U.S. Department of Defense (DOD), U.S. Department of Energy (DOE), U.S. Department of Health and Human Services (DHHS), U.S. Department of the Interior (DOI), U.S. Department of Transportation (DOT), U.S. Environmental Protection Agency (EPA), and U.S. Nuclear Regulatory Commission (NRC).

Representatives of these agencies serve as members of the Federal Radiological Emergency Preparedness Coordinating Committee (FRPCC) and of a Regional Assistance Committee (RAC) in each of nine regions; the committees are chaired by FEMA. The FRPCC assists FEMA in providing policy direction for the federal program of assistance to state and local governments in the development of their radiological planning and preparedness activities. The RAC in each of the nine FEMA regions in which nuclear power plants are located collaborates on plan review and exercise evaluation in accordance with "Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants."⁶ This joint FEMA-NRC document, promulgated under 44 CFR 350, is the primary guidance reference for the program. In addition, there exist a number of "guidance memoranda," which provide further information on policy interpretation and procedures.

A complete understanding of the FEMA REP program also requires a discussion of its relationship to the U.S. Nuclear Regulatory Commission and the NRC licensing requirements for nuclear power plants. Under 10 CFR 50.47(a), the NRC may not issue an operating license to a commercial nuclear power plant without first finding that "there is reasonable assurance that adequate protective measures can and will be taken in the event of a radiological emergency" at the facility. Under 10 CFR 50.54(q), the NRC requires emergency plans that meet this standard in order to retain the operating license that has been granted. The "findings and determinations" that FEMA makes pursuant to 44 CFR Part 350 regarding the adequacy and implementation capability of state and local emergency plans are presented to the NRC in its licensing inquiry and constitute a "rebuttable presumption" as to whether the standard is met. Thus, FEMA's judgments about the status of state and local radiological emergency plans and preparedness play a key role in any NRC decision to issue or maintain a nuclear power plant operating license.⁷ This situation creates a powerful incentive for a nuclear utility to take whatever steps it can to make sure that the state and local plans are sufficient to meet FEMA criteria.

2.2 EXERCISE EXPERIENCE

Both the DA and FEMA have extensive exercise experience. The following material provides an overview of the Army's CSM and FEMA's REP exercise experience, including a review of the various types of exercises conducted under each program.

2.2.1 DA Chemical Surety Material Exercise Program

In February 1970, a "Field Grade Chemical Officer" position was added to the U.S. Army Materiel Command Surety Field Activity staff.⁴ This addition marked the beginning of AMCSFA involvement in the chemical surety material exercise program. Initial AMCSFA activities included establishing a surety and operational inspection (SOI) at each AMC installation with a chemical surety mission.

The Army's first service response force exercise was conducted in 1985. The SRFX executes the DA mandate, in AR 50-6, to maintain the chemical SRF capability and to exercise that capability biennially.

The SRF is a national force of DA personnel from around the country that responds to accidents involving Army chemical warfare agents.⁸ This force, which is commanded by a general officer, consists of a crisis management unit, portions of the installation-based initial response force (IRF), emergency medical personnel, explosives ordnance disposal teams, communications personnel, and other Army technical specialists and response units as might be needed.

An SRFX is a real-time response of the SRF to a simulated chemical agent accident on an installation with a chemical surety mission. For the first two years (1985 and 1986), the exercise was driven by a nuclear weapon accident/incident. Beginning with SRFX-87, the exercise scenarios have alternated between a nuclear and a chemical accident/incident.⁴ SRFX exercises conducted to date and their respective scenarios are as follows:

SRFX-85 Nuclear Scenario SRFX-86 Nuclear Scenario SRFX-87 Chemical Scenario SRFX-88
Nuclear Scenario SRFX-89 Chemical Scenario

Since October 1988, AMCSFA has conducted SMRs, which are assessments of an installation's entire chemical surety mission. These assessments include a review of installation plans and an evaluation of installation CAIRA capabilities through a combination of limited-scale and full-scale exercises⁹ AMCSFA plans and conducts CSM exercises for its major subordinate command (MSC) installations. The three MSCs and the nine installations subject to SMR assessments are as follows.

Armament, Munitions, and Chemical Command (AMCCOM) Newport Army Ammunition Plant
(NAAP) Pine Bluff Arsenal (PBA)

Depot Systems Command (DESCOM) Anniston Army Depot (ANAD) Lexington-Bluegrass
Army Depot (LBAD) Pueblo Depot Activity (PUDA) Tooele Army Depot (TEAD) Umatilla
Depot Activity (UMDA)

Test and Evaluation Command (TECOM) Aberdeen Proving Ground (APG) Dugway Proving Ground (DPG)

Since its involvement in CSM exercises, AMCSFA has conducted and coordinated well over 500 CSM exercises.

2.2.2 FEMA Radiological Emergency Preparedness Program

On December 7, 1979, following the accident at the Three Mile Island Nuclear Power Station near Harrisburg, Pa., the President of the United States directed FEMA to assume lead responsibility for all off-site planning for accidents at commercial nuclear power plants. This lead responsibility has been strengthened over the years).¹⁰

Full-scale field exercises are required to be performed biennially for each commercial nuclear power station,¹¹ These are the exercises that FEMA and the RAC observe and evaluate. Smaller-scale drills are held by the state and local emergency response organizations more frequently in order to test equipment and/or response. The drills generally do not involve federal observation or evaluation, with two exceptions: (1) alerting and notification testing, which may be observed by FEMA to determine adequacy for a "350 finding";⁵ and (2) medical drills, which may be performed separately from a full-scale exercise,¹¹

A "full-scale" exercise is defined as an "integrated" exercise that activates and involves both the federal government and the state and all appropriate local government entities as well as the licensee of the NRC (the power station).⁵ To the extent achievable, these exercises include participation by the appropriate federal agencies. The off-site portion of the exercise is observed and evaluated by FEMA with RAC assistance, and NRC observes the licensee's response on-site. "Full participation," a requirement of a full-scale exercise, means that state and local government emergency personnel are engaged in sufficient numbers to verify the capability to respond to the actions required by the accident scenario; that the integrated capability to adequately assess and respond to an accident at the facility is tested; and that implementation of the observable portions of the state and local plans are tested.

If problems are observed in a full-scale exercise that are considered significant enough to adversely affect the public health and safety, these deficiencies are subsequently tested in a remedial exercise.¹² Remedial exercises are observed and evaluated by FEMA and those members of the RAC representing agencies whose expertise is pertinent to determining whether the deficiency has been adequately corrected. For example, if there is a transportation deficiency, the DOT member of the RAC may observe and evaluate the remedial exercise.

3 PRE-EXERCISE ACTIVITIES

Conducting any exercise requires considerable advance planning and coordination to assure that exercise participants derive the maximum benefit from the experience. This section describes planning and coordination activities that take place before an exercise begins.

3.1 EXERCISE PLANNING TIMETABLES

As the scale of an exercise increases (i.e., from a tabletop exercise with few participants up to a full field exercise with numerous participants from multiple jurisdictions), the amount of time for planning and coordination of the exercise also increases. The use of a planning timetable, either mandated or self-imposed, is one means of ensuring that adequate time is allowed for completing the many planning tasks that need to be carried out before an exercise that involves numerous players, controllers, and evaluators. The following section describes the time frames within which exercise planning activities typically occur for CSM and REP exercises.

3.1.1 DA Chemical Surety Material Exercise Program

The amount of time required for advance planning and coordination varies with the type of exercise conducted. The timing of activities that occur prior to, during, and following these exercises is not mandated by an Army regulation, but varies considerably with the work load of the individuals and agencies involved. It is not unusual for staff at AMCSFA and USADACS to be planning several exercises simultaneously.

For full field exercises, such as SRFX-89, the following timetable would be typical.¹³

Time Prior to Exercise	Activity Conducted
14-24 months	Preliminary discussions -- centered on the focus, potential site, and planning timetable -- take place. Army personnel from various commands and agencies may be involved in this activity.
9 months	Brainstorming meeting held to address exercise basics, including obtaining commitments from "players" (exercise participants expected to demonstrate specific response capabilities) and recruiting controllers and support staff. Army personnel possessing "most knowledge" about chemical accidents/incidents and exercises are involved. To date, this activity has not included potential off-post participants.
Variable	Exercise objectives defined.

Cont'd

Time Prior to Exercise	Activity Conducted
Variable	Exercise scenario developed.
30 days	"Controller Handbook" distributed.
7 Days	Controller training conducted. During training sessions, controllers receive communications equipment operating instructions.

Exercise Week Exercise conducted.

3.1.2 FEMA Radiological Emergency Preparedness Program

Considerable advance planning precedes a full-scale biennial REP exercise. These exercises test the areas requiring corrective action identified at previous exercises as well as revisions to the plans and training that have been on-going during the two-year period since the last exercise. Therefore, preparations for the next exercise typically begin six months to a year after an exercise has been conducted. The following actions and activity milestones are required. They establish a required schedule for the final three months leading to a full-scale REP exercise.¹⁴ The schedule is as follows.

Time Prior to Exercise	Action Required
90 days	State and licensee jointly develop and submit exercise objectives to FEMA and NRC regional offices.
75 days	FEMA and NRC regional offices complete reviews of objectives and extent of play after meeting with licensee/state, if necessary.
60 days	State and licensee submit exercise scenario to FEMA and NRC for regional review.
45 days	FEMA and NRC regions contact or meet with state and licensee to discuss modifications and complete the scenario. Agreed-upon changes or modifications should be documented and distributed.
35 days (optional)	RAC chair calls meeting of controllers to develop coordination of exercise.

Cont'd

Time Prior to Exercise	Action Required
30 days	FEMA and NRC regions develop specific post-exercise activity schedule for debriefings and meetings with the State.
15 days	The RAC chair (with NRC team leader, as available) develops evaluator action plan, i.e., number of observers, where observers will be stationed, and what they will see demonstrated (end product of this is the "evaluator packet").
1 day	All federal evaluators, both on-site and off-site, meet in the exercise area to receive orientation and final instructions.
Exercise Day (ED) Exercise conducted.	

3.1.3 Comparative Analysis

Exercise planning timetables for CSM and REP exercises are similar in that both programs involve the simultaneous planning of multiple exercises with planning lead times of as much as 14 to 24 months. It is common for both programs to begin focusing on the next exercise, at a given site, within a few months of the completion of the previous exercise. The basic planning activities leading up to an exercise are essentially the same for both programs. The primary difference between the two programs is that for FEMA REP exercises the later planning activities (those conducted within 90 days of the exercise) conform to a required timetable,¹⁴ while there is no such required timetable for DA CSM exercises.

3.2 EXERCISE SCALE AND FREQUENCY

The three exercise types identified and described in the overall guidance document for the CSEPP³ are tabletop, functional, and full-scale. These types, as conducted under the Army and FEMA exercise programs, are now discussed and compared. The frequency with which each type of exercise is conducted by the Army and FEMA, under their respective programs, is also examined. The draft guidance describes these exercise types as follows.

Tabletop exercises are gatherings of officials, key emergency management staff, and, for the CSEPP, Army liaisons to a local emergency operations center (EOC) for the purpose of discussing various emergency scenarios that a community or entity might face. Such exercises are a cost-effective means of testing interfaces among agencies and acquainting officials and staff with emergency plans and procedures.

Functional exercises are used to test off-post EOC capabilities without actually deploying field response elements. Simulation and controllers are used to provide input to exercise

participants. These exercises are typically driven by a scenario describing the simulated emergency, a list of the major events occurring during the exercise, and exchanges between players and controllers. Functional exercises are also a cost-effective method of testing a community's emergency management system. According to the guidance, Army involvement in off-post functional exercises should at least include sending designated liaisons to participating off-post EOCs.

Full-scale exercises, involving an Army installation and all potentially affected local government jurisdictions, result in the mobilization of emergency response organizations. These exercises typically test the capabilities of response organizations in several functional areas, which include initial notification and staff mobilization, reliability and use of emergency communication systems, command and control, accident/incident assessment, alerting and notifying the general public, protective-action decision making, implementation of protective actions (including resource allocation), and recovery and restoration planning and implementation. The planning guidance specifies that, although there are advantages to full-scale Army participation, such as in the SRF exercises conducted annually, the term "full-scale" applies to off-post community organizations and does not imply full-scale Army participation with deployment of the SRF.³

3.2.1 DA Chemical Surety Material Exercise Program

Tabletop and functional exercises are not generally conducted as a means of exercising chemical accident/incident response and assistance capabilities.⁹ Tabletop discussions evolved out of the free-play exercise activities during SRFX-89, specifically in the later stages of recovery and re-entry activities, but a tabletop exercise was not planned.

Under AR 50-6, installation commanders are responsible for conducting quarterly chemical accident/incident exercises. Annually, one of the quarterly exercises should "provide for testing of any existing plans with State and local or other supporting agencies." Army participation involves the installation's IRF. The participation of off-post jurisdictions usually is limited to the activation of emergency operations centers.

AR 50-6 also requires that, at least every 18 months, the commanding general of AMC exercise the CAIRA capability at each AMC installation having a CSM mission. These exercises are usually combined with a surety management review planned and conducted by AMCSFA, and they are full-scale from the installation's perspective. Installations also conduct full-scale and some smaller-scale exercises for inspections by the appropriate MSC. The total number of full-scale installation exercises conducted each year ranges from five to eight, with off-post participation (by local governments) required in one (quarterly) exercise each year.

Because they involve national resources as well as installation and local resources, SRF exercises are larger than full-scale exercises as defined in the CSEPP planning guidance.¹³ An SRFX is conducted once annually, with the scenario alternating between a nuclear and a chemical accident/incident scenario. An SRF composed of Army units from around the country and elements of an installation's IRF is mobilized and responds in real time. Virtually all field activities that would occur during an actual response are exercised. The level of off-post participation varies from exercise to exercise and installation to installation, depending on the availability of funding and personnel. Another partial determinant of off-post participation is the degree to which the citizenry and local governments support the installation's chemical surety mission.

3.2.2 FEMA Radiological Emergency Preparedness Program

The FEMA REP program recognizes drills and three types of exercises: tabletop, partial participation, and full-scale. These activities vary in scope and frequency depending on their purpose.

A drill is a supervised instruction period aimed at testing, developing, and maintaining skills in a particular emergency response operation. Drills are often part of an exercise, and they are supervised and evaluated by a qualified drill instructor. The REP program recognizes four types of drills: communication, medical emergency, radiological monitoring, and health physics.¹¹

Communication drills are conducted at varying intervals to test equipment and the capabilities of personnel to understand the content of messages. Communications among state and local governments within the plume of an emergency planning zone (EPZ) are tested monthly. Communications with federal emergency response organizations and the state (or states) within the ingestion pathway EPZ are tested at least quarterly in conjunction with the plume EPZ communication drills. Finally, communications between the licensee, state and local EOCs, and field monitoring teams are tested annually.

Medical drills involve the simulated contamination of an individual who, for purposes of training the involved emergency workers, may also have a simulated injury. These drills may involve contamination of a worker at the nuclear plant or of a citizen who has been contaminated off-site by radioactivity released as a result of an accident. Local medical service agencies (i.e., ambulance services and off-site hospitals) must participate in these drills, which are conducted annually and which may be conducted in conjunction with the biennial full-scale exercise?

Requirements for two types of radiological monitoring drills have been established. Drills designed to test radiological monitoring for the plume exposure pathway must include provisions to test communication equipment and personnel as well as the capability to monitor, record, transmit, and receive technical data. Ingestion pathway monitoring drills are designed to test the collection of samples and the provisions for communications and record keeping (i.e., chain of custody for samples). Both of these radiological monitoring drills are conducted annually.

Health physics drills test the response to and analysis of simulated elevated airborne and liquid samples and direct radiation measurements in the environment. These drills are conducted semiannually by each licensee, and a state government may conduct such a drill at any site affecting that state. The off-site portion of these drills is frequently done in concert with the radiological monitoring drills.

Tabletop FEMA exercises are limited in scope and not formally recognized as part of the FEMA REP program. However, they are typically used as an extension of ingestion pathway exercises to test re-entry and recovery planning. Emergency response planners and decision makers use the scenario to determine how the area affected by the implementation of protective actions can be recovered for habitation. In this context, a tabletop planning discussion is employed to confront an exercise problem that could not otherwise be handled within the time constraints of an exercise. The tabletop exercise allows the recovery and re-entry aspects of the plan to be discussed rather than demonstrated. Field activities are simulated.

Partial-participation FEMA exercises could be considered counterpart to the functional exercises established by the CSEPP guidance. Partial participation refers to the requirement for states with ingestion pathway responsibilities resulting from the location of nuclear power plants (either inside or outside their borders) to "partially participate" in at least one of the ingestion pathway exercises for each of those sites in a six-year cycle. Partial participation requires deployment of state and local emergency personnel to test the direction and control functions and related communications for protective-action decision making and dissemination of emergency information to appropriate individuals, groups, and the general public.⁵ States partially participating in an ingestion pathway exercise are not required to deploy their field sampling teams or to analyze samples, since these activities can be simulated.

Full-participation FEMA exercises are the equivalent of full-scale exercises provided for in the guidance for the CSEPP. These exercises deploy state and local emergency personnel in sufficient numbers to verify the organizations' capability to respond to all actions required by the accident scenario. They are designed to test the integrated capability to adequately assess and respond to the accident scenario and the implementation of the observable portions of the state and local plans. These exercises are evaluated biennially by FEMA. If a licensee and a state decide to conduct these exercises annually, FEMA does not evaluate the off-year exercise. However, independent evaluation is encouraged as a means of verifying the emergency preparedness of the participating organizations.⁷

3.2.3 Comparative Analysis

The CSM and the REP exercise programs are similar in that both program staffs plan, coordinate, and conduct full-scale exercises. The DA exercises (SRFXs, SMRs, and installation quarterly exercises) are all full-scale in that they involve the mobilization of the entire IRF, including command and control staff, installation technical support staff, and all field teams that would normally respond to a CAI. Two distinctions exist between DA and FEMA programs with regard to exercise scale: (1) for the DA, off-post participation in each installation's quarterly exercises is currently limited to once each year (the exception to this situation occurs when an installation is selected to host an SRFX); and (2) the DA does not usually conduct smaller-scale exercises; these are conducted, however, under and in support of the REP program.

The DA and FEMA differ in the frequency with which they conduct exercises. Under the DA CSM exercise program, installations conduct at least four full-scale CSM exercises each year, while a full-scale REP exercise is conducted every two years for each nuclear power plant, with smaller-scale exercises conducted on a regular basis.

3.3 SCHEDULING EXERCISE ACTIVITIES

While many exercises are designed to test only a portion of plan implementation capabilities (such as emergency communications, command and control, and protective-action decision making), others are far more comprehensive and test many emergency response capabilities described in plans. The length of time over which an exercise is conducted also varies, depending on the constraints of funding, availability of personnel, and time commitment of participating jurisdictions.

The time during which an exercise might be conducted is often limited, and, within these time limitations, the participants need to demonstrate the ability to deal with many aspects of an emergency response. Therefore, it is usually necessary to accelerate time within the scenario so that response activities that would normally take place over several days may occur in a single-day exercise. Two exercise planning tools frequently used to address these needs are time compression (“jumping” the scenario ahead several hours or days) and scheduling events out of sequence.

This section describes the length of various CSM and REP exercises, as well as the use of time compression and out-of-sequence events in each of the respective programs.

3.3.1 DA Chemical Surety Material Exercise Program

The length of CSM exercises varies with the exercise type. A typical SRF runs for four days, 24 hours a day, with most of the exercise activity occurring in real time. Other exercises, such as the quarterly installation exercises, are shorter and may use time compression to advance the scenario ahead to drive additional exercise play. In both of these exercise types, events may be slowed down to allow more exercise play to occur, but time compression and out-of-sequence events are not used.

The SRF exercises start with a simulated initiating event that results in the simulated release of a chemical agent into the atmosphere.¹⁶ The initiating event is frequently some sort of natural disaster (such as an earthquake or tornado) that threatens the integrity of the chemical agent storage area. The scenario may be further complicated by the occurrence of a simulated accident during the handling of agent munitions or storage vessels. Depending on the pre-exercise participation parameters established, the scenario usually calls for simulating either agent or agent-carrying munitions to be released or projected off-post. This evokes the involvement of off-post (i.e., local and state) authorities, who must respond in a coordinated way to protect the populations in their jurisdictions.

The early stages of an exercise call for such activities as accident assessment, notification of other emergency organizations, alerting and notifying of the public (simulated), development of protective-action recommendations by the installation commander, decisions to initiate and implement protective actions (sheltering or evacuation) by off-post authorities, establishment of evacuee shelters, and mobilization of emergency medical services. As the exercise progresses, emphasis shifts toward meeting the needs of evacuees, media relations, and continued assessment of agent impact on and off the post. The later stages of an exercise (latter part of the third day plus the fourth day) focus on recovery and restoration activities.

Installation or on-site exercises are smaller-scale. They are usually conducted within a single work day and are far narrower in scope than the SRF exercises. They usually involve a limited scenario that calls for post response personnel and decision makers to confront an agent release or a potential agent release situation. Local jurisdictions may also be involved in the exercise, but such involvement may be limited to the jurisdiction's emergency operations center and emergency management personnel.¹⁷ Under these exercise parameters, it is not unusual for both time-compression and out-of-sequence events to be a part of the exercise scenario.

3.3.2 FEMA Radiological Emergency Preparedness Program

Full-scale exercises vary somewhat in their duration in accordance with each particular scenario. Generally, plume exposure exercises that test response to an airborne radiological release migrating off-site do not run more than the length of a working day, or about eight hours. However, eight hours is not a long enough period in which to realistically demonstrate the response that would occur during an actual incident. A time compression is nearly always included in the scenario, and the "clock" is made to "jump" a number of hours ahead. This technique is especially useful in driving shift changes of personnel that would not normally take place during an 8- to 12-hour exercise day. Frequent wind shifts represent another technique for including as much of the 10-mile plume exposure EPZ as possible in a FEMA exercise. These wind shifts affect the direction of the radioactive plume. As a result, more areas, people, and municipalities are called upon to react to the accident scenario than would be realistic or normal in an 8-hour period. Other response activities may be tested out of sequence with the scenario. For example, the evacuation of a particular population, such as school children or residents of a senior citizens home, might be demonstrated when it is convenient (and safe) for the school or adult home, rather than when it would actually occur during an accident.

Emergency response to "ingestion pathway" contamination is usually demonstrated separately. The ingestion pathway refers to the radioactive contamination of vegetation, food crops, milk, meat, poultry, water, and animal feeds, and comprises a 50-mile planning zone around each nuclear power plant. Ingestion pathway techniques and equipment must be demonstrated during at least one full-scale exercise in a six-year cycle.¹¹ These response functions are often performed the day following the plume exposure pathway portion of an exercise, with participants using data extrapolated from that earlier phase of the scenario.

"Re-entry and Recovery" is also demonstrated out of sequence -- it would take a number of days or weeks to reach this phase of a radiological emergency response. Re-entry and recovery planning, decision making, and response are usually demonstrated by means of a "tabletop" discussion.

3.3.3 Comparative Analysis

Exercises conducted under the CSM and REP programs differ in the amount of time spent in actual exercise play. An SRFX is conducted over three and a half to four days, with exercise play occurring 24 hours a day for some exercises. Larger REP exercises -- such as those involving many participating organizations and incorporating not only plume exposure but also ingestion pathway exposure and recovery and re-entry planning -- may involve multiple days of play. However, plume exposure REP exercises are, typically, conducted during a single day over six to eight hours. The time devoted to exercise play in quarterly installation exercises, and in exercises conducted in conjunction with SMRs, is similar to that used for equivalent purpose in REP exercises.

In general, CSM exercises use neither time compression to advance the scenario nor out-of-sequence demonstrations, both of which are common during REP exercises.

3.4 DEVELOPING EXERCISE OBJECTIVES

An early and significant step in the exercise planning process is the development of exercise objectives. Objectives specify the areas in which performance will be observed and evaluated; they provide a framework for exercise planning and evaluation. The processes of developing CSM and REP exercise objectives are described below.

3.4.1 DA Chemical Surety Material Exercise Program

For each CSM exercise conducted by the Army, a set of exercise objectives is developed. While the same objectives may be developed for more than one exercise, a standard set of objectives for all CSM exercises does not exist, even though all exercises are conducted in fulfillment of AMC's chemical surety mission as delineated in AR 50-6. SRF exercise objectives tend to be general and to address the kinds of training participants are to receive; these objectives are developed by AMCSFA in collaboration with other Army offices and agencies.

Objectives for the quarterly installation exercises, also conducted to meet the requirements imposed by AR 50-6, are developed by installation surety personnel and address particular training needs.

For SMRs, which test the installation's CAIRA capabilities, specific exercise objectives are developed by AMCSFA for each installation with a CSM mission. "After action reports" (AARs) and scenarios from quarterly exercises and SMRs are routinely submitted by each installation to AMCSFA for review and use in the ongoing development of exercise objectives.⁴

3.4.2 FEMA Radiological Emergency Preparedness Program

FEMA requires that, over a period of six years, 36 objectives be addressed by the utility and by state and local governments participating in full-scale exercises.¹⁴ Deciding which of these objectives will be demonstrated at a biennial exercise begins well in advance of the exercise (as described in Sec. 3.1 above). Response capabilities in 10 functional areas are to be demonstrated at each full-scale FEMA exercise. These functional areas are as follows, with the EEMA objective or objectives addressed by each shown in parenthesis.

1. Monitoring and comprehension of emergency classification levels (objective 1),
2. Mobilization of emergency personnel (objective 2),
3. Direction and control of emergency activities (objective 3),
4. Communications (objective 4),
5. Facilities, equipment, and displays (objective 5),
6. Emergency worker exposure control (objective 6),

7. Field radiological monitoring (objectives 7-9),
8. Plume dose projection (objective 10),
9. Plume protective-action decision making (objective 11), and
10. Alerting and notification of response organizations, and dissemination of emergency information (objectives 12-15).

The state and licensee, in conference, also agree on which organizations will demonstrate response capabilities that satisfy some or all of the following objectives at a full-scale exercise:

1. Use of potassium iodide (KI, a radioprotective drug) (objectives 16 and 17),
2. Implementation of protective actions (objectives 18 and 19),
3. Traffic control (objective 20),
4. Relocation of population (objectives 21 and 22),
5. Medical services (objectives 23 and 24), and
6. Decontamination (objective 25).

Finally, the state and licensee, in conference, decide on which of the following objectives will be addressed (with appropriate demonstrations of response capabilities) at a particular full-scale exercise within a six-year cycle:

1. Supplementary assistance (i.e., federal and other outside support agencies) (objective 26),
2. Ingestion exposure pathway (objectives 27-30),
3. Recovery, re-entry, and relocation (objectives 31-33),
4. Mobilization of emergency personnel on a 24-hour, continuous basis (objective 34),
5. Evacuation of on-site (plant) personnel (objective 35), and
6. Unannounced and off-hours exercise (objective 36).

All local and state jurisdictions in the plume EPZs and all state authorities affected by ingestion pathway exercises are expected to participate in the exercises that test their radiological emergency plans, procedures, equipment, and response personnel.⁵ However, the objectives chosen, the scenario, and the previous exercise experiences determine what will be demonstrated and which specific groups of people will participate in a particular exercise. For example, all school districts serving students who live within a plume EPZ would be expected to participate in the notification activities for all full-scale exercises. If school X successfully demonstrated evacuation in the last exercise, then the school district might choose school Y to be involved in

an evacuation demonstration at the next exercise. All schools, or, at a minimum, all school districts within a plume EPZ would be expected to participate in at least one exercise in a six-year cycle. Another example would be the demonstration of medical services. If, as a result of its location, town A was affected by the plume and successfully demonstrated its ability to provide medical services (such as transportation of ill or injured people) in a previous exercise, then the objectives and scenario would be more likely to involve a different town in the next exercise.

3.4.3 Comparative Analysis

For each SRF and SMR, AMCSFA develops a set of broad exercise objectives. Although each exercise conducted has the same general purpose, to further the chemical surety mission, there is no required set of objectives. Installations develop objectives primarily based on training needs for each quarterly exercise. In FEMA REP exercises, a complete set of required exercise objectives must be demonstrated and met during a six-year cycle. Each objective corresponds to a specific emergency response function or group of functions. Some latitude exists for the state to determine when objectives will be demonstrated within the six-year cycle.

3.5 EXTENT OF EXERCISE PLAY

A key part of the exercise planning process is the definition of the extent of play that will occur during the exercise. The extent of play sets the parameters of the exercise by specifying which activities will actually be demonstrated and which activities will be simulated or staged. Other factors considered are the use of actors and "props" to stage a scene at which exercise players will demonstrate their response activities.

Another consideration is how unexpected events will be handled. During the course of any exercise, a number of unexpected circumstances may arise and have an effect on the exercise. A well-planned exercise management scheme will anticipate the potential for unknown contingencies and provide a framework within which these contingencies might be accommodated, while still allowing the exercise to continue.

Each extent-of-play component should be part of a pre-exercise agreement between participating organizations and the sponsoring authority. The following material describes the role of simulation, staging, control cells, and unexpected events in defining the extent of play in SRF and REP exercises.

3.5.1 DA Chemical Surety Material Exercise Program

Simulation plays a role in SRF exercises, but its use is closely monitored by exercise management¹³ All simulations must have the prior approval of the exercise director or a deputy director. The most common reason for approving a simulation request is that actual exercise play would compromise the safety of a player, observer, evaluator, controller, or the public.

Players seeking approval for a simulation relay a request for approval through the controller assigned to their location. The controller then contacts the appropriate functional area leader, who receives and forwards the request to the exercise director or deputy director. Once

a request is approved, the functional area leader notifies the controller of the approved parameters of the simulation.¹⁶

During SRF exercises, numerous events are staged to increase realism for the responder. An accident initiating an emergency response is a prime example. At SRFX-89, for example, the accident scene was set up using actors to provide realistic impressions, Army vehicles, an empty storage igloo, smoke pots, and "dummy" training munitions, so that the responders had realistic visual cues to prompt appropriate actions. Other events that were staged involved actors/controllers posing as Congressional delegations and the media.

During SRFX-89, an extensive effort was put forth to create a realistic environment for officials dealing with the simulated press. Army Materiel Command Public Affairs personnel and staff from the U.S. Army Information Systems Command together established a simulated television news operation that covered press briefings, interviewed actor "experts" from around the country, developed entire simulated newscasts, and made videotapes of all these activities available to the Public Affairs Officer (PAO) to help develop material for upcoming briefings by installation and SRF staff.

Representing nonparticipating persons or organizations, SRFX-89 exercise controllers staffed a control cell entitled "Off Post Contacts."¹⁸ Any player needing to contact an organization or individual not participating in the exercise was directed to call a number at the control cell. When the caller answered, the player was to state which organization or agency he or she represented, and which organization they were attempting to contact. The controller was to then communicate with the player as if he or she were actually the nonparticipating party the player was trying to reach.

3.5.2 FEMA Radiological Emergency Preparedness Program

Many activities off-site from the nuclear power plant may be simulated rather than actually demonstrated. Generally, it is FEMA's view that an all-out, fully activated demonstration can be disruptive to the communities involved and endanger public safety. In this way, off-site emergency response activities differ dramatically from on-site exercise response activities. In order to allow the local jurisdictions to continue their daily life, the actual demonstrations of evacuation are very limited. Dispatching of vehicles (such as ambulances, buses, and tow trucks) to specific areas may only be simulated by telephone calls. If an exercise is being held late at night, the sounding of sirens may be simulated rather than risk awakening or frightening those nonparticipants who might hear the sirens. However, the trend in recent years has been toward more realistic scenarios with more demonstration and less simulation.

Simulation is determined on a plant-by-plant and exercise-by-exercise basis, and depends, at least partly, on the characteristics of the area. Possible factors include population and the attitude of the population towards the plant, whether the municipal civil defense positions are volunteer (as they are throughout much of New England) or paid, and whether the lowest involved level of government is the county or a small town. However, in one way or another, FEMA and the RAC have to be persuaded that the off-site organizations would know what to do to protect the population in the event of a real emergency.

Because the real world goes on around the playing of an exercise, it is unlikely that all the "players" can be represented by their real-world counterparts. Therefore, actors may be used

to play the parts, for example, of reporters and political figures. Actors are, obviously, never used for emergency management roles; they are used solely to provide a measure of realism to the exercise. Often this function is performed by the controllers at FEMA exercises.

Controllers assigned to each location are responsible for managing certain aspects of the functioning of the exercise as it occurs. The controller usually is an employee of the state or the licensee. Under some circumstances, FEMA may direct an evaluator to perform specific controller functions, such as injecting controller messages. FEMA personnel also may staff a control cell that performs in place of nonparticipating organizations. The controller is, unlike the players, fully informed about the scenario and what is expected to occur, including surprise messages that trigger demonstrations that otherwise might not occur. For example, in a local EOC, the controller may give an envelope to the EOC director that contains a message saying that a truck carrying chemicals has just overturned and is now blocking the main evacuation route that runs through or by a county or town. This would affect the ability of the community to evacuate its citizens, and the EOC director would have to demonstrate that the town could respond to this emergency while coping with the effects of an accident at the plant.

In addition to planned "unexpected" events are those that are unplanned, and the controller and the players must respond as best they can. For example, the chemical truck may not be fictional; such an accident could actually occur in the middle of an exercise. How the players respond would then become part of the exercise itself. The "rules of the game" include incorporating real-world incidents.

Another situation that could arise is the "unique fix" in which players could arrive at a solution to a problem that would throw off the functioning of the exercise as planned in accordance with the written scenario. This is most likely to occur on-site, with plant operators figuring out how to solve the mechanical problems experienced at the plant and thereby prematurely ending the accident before the full scenario has been played out. Because a "unique fix" would abort the demonstration and shut down the exercise, it is a controller's responsibility to stop such an event from happening.

3.5.3 Comparative Analysis

There is considerable variance between the extent-of-play parameters established for CSM exercises and for REP exercises. Very little simulation is permitted during CSM exercises, while it is not unusual for each REP exercise to involve some degree of simulation. Generally speaking, simulation is granted during CSM exercises for safety reasons. During REP exercises, simulations may be granted for several reasons, including the nonparticipation of an organization, the safety of participants or the public, protection of sensitive equipment, availability of evaluators, and the cost of an actual demonstration.

An SRFX makes extensive use of actors and "props" to increase the realism of accident scenes, media briefings, and television news coverage of the simulated accident driving the exercise. Occasionally, REP evaluators will assume actor roles.

3.6 DEVELOPING EXERCISE SCENARIOS

Scenario development is a critical element of the exercise planning process. By acting as a script for the exercise participants, the scenario attempts to direct participant "play" by presenting a number of challenges to which emergency personnel must respond. This section describes the principles involved and the process followed in the development of CSM and REP exercise scenarios.

3.6.1 DA Chemical Surety Material Exercise Program

Scenarios for SRFxs and the 18-month installation exercises (required under AR 50-6) are developed by AMCSFA staff, with assistance provided by USADACS and other Army agencies and offices. Off-post organizations are not usually involved in the scenario development per se but are consulted to answer questions about their plans and their organization's extent of play.⁴

To assure that the player actions required by the scenario are consistent with the emergency response infrastructure in place around an installation, AMCSFA collects and reviews plans from all participating organizations. Once broad exercise parameters (i.e., which communities and organizations will be required to initiate protective actions for their populations) have been established, AMCSFA staff begin working on scenario details. Typically, the exercise scenario requires players to deal with situations involving areas where demonstrated weaknesses were identified in performance at a previous exercise.

The master scenario events list (MSEL) is a concise listing of exercise activities that will or should occur during exercise play. A "message inject" is developed for each event on the MSEL. An inject does several things: (1) describes the expected or intended player action (e.g., the PAO announces establishment of a joint information bureau); (2) identifies the means by which the action should occur or be made known to the player (player action); (3) indicates to whom the action or information should be directed (e.g., PBA Commander); (4) indicates by what means the action should occur or the information should be transferred (player action); (5) specifies the approximate time the event or action should occur; and (6) identifies the controller responsible for observing or initiating the event.

The technical aspects of the scenario -- such as defining a credible chemical surety material accident sequence needed to drive protective-action decision making and implementation, or meteorological data -- are usually developed in collaboration with staff at the Chemical Research, Development, and Engineering Center. Once off-post authorities have implemented protective actions, the scenario reverts back to the use of real meteorological data.¹³

Before and during the exercise, it may be necessary to develop a number of contingency injects, which are used when exercise play goes in an unanticipated direction. The contingency inject is designed to bring the exercise "back on track"; that is, in synchronization with the scenario.

3.6.2 FEMA Radiological Emergency Preparedness Program

Exercise scenarios are usually prepared by a licensee and a participating state. The scenario describes the events that establish the severity of the accident sequence that will be tested. Considerable technical data on plant status and meteorological conditions and changes are included. A short narrative summarizes, in laymen's language, what is to happen, and what has caused the accident. The cause is frequently an "act of God" (e.g., lightning, a hurricane, or an earthquake), which results in technical failures in the safety systems. The primary requirement for a scenario is that it create, however unrealistically at times, conditions that will test all the objectives that have been proposed by the state and the licensee and agreed to by FEMA. The scenario is submitted to FEMA and the NRC for review two months before the exercise. The RAC may be requested to examine the scenario as part of FEMA review. If the scenario is found to be unsatisfactory (e.g., by not driving protective-action decision making, or not affecting a large enough area of the plume EPZ), it will be modified by the licensee and redistributed for review by FEMA and NRC.

3.6.3 Comparative Analysis

Scenarios for SRF and REP exercises rely on technical data (such as release parameters for chemical agent or radioactive materials and meteorological conditions) to drive protective-action decision making and implementation during an exercise. These data are developed by AMCSFA for CSM exercises and by the licensee for REP exercises. REP exercises use "canned" meteorological data throughout the exercise. SRFs use real data once protective actions have been implemented.

A significant difference between the two programs concerns how scenarios are developed and reviewed. Scenarios for DA CSM exercises are primarily developed by AMCSFA, with assistance from USADACS and other sources of technical expertise. Although current plans for participating off-post jurisdictions are reviewed prior to developing injects for these organizations, AMCSFA does not usually use a "trusted agent" to review scenarios. A trusted agent is usually a nonplaying member of a participating organization who is familiar with the overall response organization. The trusted agent must protect the confidentiality of the exercise scenario. In REP exercises, the trusted agent is usually a representative from a state organization who coordinates and organizes planning for the exercise. This individual must understand how the state and local communities operate during a radiological emergency.

3.7 THE EXERCISE MANAGEMENT TEAM

Large-scale field exercises can involve hundreds of participants, including players, controllers, and evaluators, scattered among numerous demonstration sites and jurisdictions. Coordinating such an undertaking is a challenge that must be met to assure the success of the exercise. This section describes how both the Army and FEMA manage and coordinate the multiple activities occurring during their respective exercises.

3.7.1 DA Chemical Surety Material Exercise Program

An SRF exercise is conducted jointly by the U.S. Army Materiel Command Surety Field Activity and the U.S. Army Defense Ammunition Center and School, with assistance from numerous other Army offices. Together with exercise participants, the SRF exercise management team represents the best available chemical agent expertise in the Army. The team consists of the exercise director, two deputy exercise directors, and a group of functional area group leaders. In SRFX-89, for example, functional areas included off-post operations, off-post contacts, field operations, hazard analysis, public affairs, crisis management, audio/video operations, logistics support, actor control, director and staff, a "wild card" activity, and contract support.¹⁶ Coordination with off-post participants occurs through controllers and off-post jurisdictions and organizations that were not represented on the exercise management team.

Coordination of on-post and off-post activities begins with the controller training conducted the week prior to an exercise. During these sessions, controllers are instructed to work through their functional group leaders when activities between organizations need coordination. Once contacted by a controller, the leaders are then responsible for contacting the exercise director (or deputy director) and the appropriate functional area group leader. Following this protocol, top exercise management is informed of coordination activity and problems as they occur. Throughout the exercise, there is extensive contact between controllers and functional area leaders to assure that the exercise stays "on track." Periodically during the exercise, controllers, not then stationed at an observation point, are called together for briefings to discuss changes in exercise status, the scenario, or exercise logistics.

Despite the best plans and intentions, the exercise observation effort could be derailed by the loss of a controller, functional area leader, or exercise manager (due to illness or other reasons) as that leaves a demonstration site unstaffed. To assure that the exercise can continue under such circumstances, a small group of the most experienced controllers is brought together in what is termed the "wild card" activity. The wild card group consists of personnel ready to replace any member of the exercise management team.

An SMR is managed by a team of controllers headed up by AMCSFA personnel. Off-post organizations usually do not participate, and their role is assumed by a control cell comprising controllers at a bank of telephones? A quarterly installation exercise is managed by installation planning personnel. Planning personnel are often rotated so that, over the course of a year, they have had experience in the position of exercise manager and in other participatory roles.

3.7.2 FEMA Radiological Emergency Preparedness Program

Most exercise players and controllers are coordinated either by the licensee (on-site) or the state (off-site). In preparation for the exercise, instructional meetings are held for the controllers and small practice drills conducted for the players. The scenario cannot be revealed to the players in the course of these preparations.

While the licensee and off-site authorities are making their final preparations for the exercise, FEMA simultaneously identifies members of the team that will evaluate the exercise.¹⁹ This team includes most, if not all, of the RAC membership, FEMA regional and headquarters staff, and contractor support personnel. The FEMA Exercise Evaluation Coordinator, in

consultation with the RAC chair, bases the final evaluator assignments on individual expertise and on what is to be demonstrated and, therefore, observed and evaluated. If, for example, there is to be a significant demonstration of accident assessment and monitoring for radioactivity off-site, utilizing several field teams, then the evaluation team will be designed with more expertise in radiological health. Or, if the scenario and objectives call for activation of relocation centers, the Red Cross representative at FEMA will most likely be called upon to observe and evaluate these demonstrations.

The RAC chair has overall responsibility for the FEMA evaluations conducted at biennial REP exercises. A member of the FEMA REP staff who reports to the RAC chair is usually the exercise coordinator. Generally, staff members have been assigned lead responsibility for certain plant sites; coordination of the exercises for those sites is, then, part of that person's job. The coordinator is the FEMA point of contact before, during, and after the exercise for nearly all aspects of the exercise. Therefore, management of the evaluators during the exercise is the responsibility of the exercise coordinator. If problems are encountered during the exercise, the evaluator at the location where this problem occurs will call the exercise coordinator to obtain instructions on how to proceed. Problems that have arisen include: an EOC that is never activated, an EOC that would like to shut down operation early (before termination of the exercise), evaluators getting lost, and events that preclude or affect a response demonstration. The coordinator acts as the troubleshooter for all practical problems experienced by the evaluators.

In addition to the exercise coordinator, there are team leaders for the subcategories of the exercise. For example, the state activities will be observed by a team, and there will typically be one person appointed to lead that team of evaluators. Local activities will also have a team leader, as will such activities as field monitoring, reception and decontamination, and the emergency operations facility (the on-site EOC). A team leader reviews and collects the exercise modules from each member of the team and discusses the results of the exercise for that location or function with the team at post-exercise meetings.

3.7.3 Comparative Analysis

Exercise management practices for the two programs are similar in that they rely on a team structure to coordinate exercise activities. SRFX management teams are divided into functional areas. Most of the functional areas are involved in coordination of on-post play. A single functional area team is assigned to off-post organizations. REP exercise teams are similarly configured, with a team assigned to each participating organization or functional activity.

The DA SRFX and the FEMA REP programs differ in that AMCSFA's management team members perform as controllers and evaluators, while FEMA REP exercise teams are usually limited to evaluators. Occasionally, however, REP evaluators also act as controllers.

3.8 EXERCISE PARTICIPANT TRAINING

Prior to the beginning of an exercise, emergency response personnel receive training to familiarize them with proper response procedures and their jurisdiction's plan. Similarly, exercise participants (controllers and evaluators) receive training so that they will know (1) what to expect during exercise play; (2) how to respond to player inquiries; (3) how to record

observations made during exercise play, (4) what to do if the unexpected occurs, and (5) what is expected of them before, during, and after the exercise.

3.8.1 DA Chemical Surety Material Exercise Program

Personnel selected to serve as controllers for SRF exercises typically have an extensive background in the chemical agent field. These persons have participated in previous SRF exercises and received training in the storage, shipment, safety, surveillance, and security of lethal and incapacitating chemical agents and munitions. In addition to the technical training that Army personnel have received as a result of their normal duties, SRF exercise controllers receive an additional week of training immediately before the exercise begins.

During the week, exercise management reviews its management concept by introducing functional area leaders to and discussing the exercise plan. Controllers are provided with information on the scenario and what to do if the unexpected (such as a real-world emergency) occurs and disrupts the flow of exercise play. Instruction is provided on how to complete controller/player observation forms and what documents are to be retrieved prior to the end of exercise play. Controller packets distributed during training include the following materials:

- The exercise plan,
- Communications equipment operating instructions,²⁰
- A communications directory describing radio and hard-copy message protocol used during the exercise,
- A list of all exercise locations and controller telephone numbers at the locations,¹⁸
- An organizational chart showing the members of the exercise management team,
- A list of all participating off-post organizations,
- A master scenario events list,
- All injects developed for the controller's demonstration location, and
- A supply of blank contingency inject forms.

Information on controller communications -- including radio call signs, use of radio and telephone equipment,²⁰ and controller and player telephone directories -- is distributed and reviewed.¹⁸ Because much of the exercise activity occurs at the installation site and because the installation's mission continues throughout the exercise, time is spent reviewing base security requirements.

Working with the functional area leaders, controllers begin reviewing the exercise scenario and developing contingency injects. Demonstration site assignments are reviewed and

appropriate maps distributed. Controllers, particularly those assigned to off-post locations, may spend time conducting site visits.²¹

3.8.2 FEMA Radiological Emergency Preparedness Program

The FEMA REP exercise evaluators receive formal training in radiological emergency planning at the Emergency Management Institute, which is part of the National Emergency Training Center in Emmitsburg, Md., a facility owned and operated by FEMA. This training includes instruction in the concept of radioactivity, the basics of nuclear power plant design and operation, the concept and organization of emergency response, and instruction in exercise evaluation methodology.

State and local governments, in addition to providing field training for exercise participants from their organizations, may also send their players and controllers to the Training Center for this FEMA course.

Before the exercise, an evaluator packet is sent by FEMA to the observers. The packet contains:

- Portions of the plan applicable to their assignment,
- A list of all exercise evaluators and their assignments,
- A time line of events as they are supposed to occur,
- A summary of the scenario,
- Scenario technical data as required for those assigned,
- Previous exercise findings,
- Applicable controller messages,
- Applicable reference materials,
- Logistical information, and
- Log forms for taking notes.

The final step occurs the day before the exercise, when FEMA evaluators are briefed by the RAC chair and the FEMA exercise coordinator on the particulars of the exercise and on the observations/evaluations that are to be made.¹⁴ Assignments are confirmed, and locations are verified. Usually, nonplayer representatives from the licensee, the state, and sometimes the local jurisdictions attend the evaluator briefing. The licensee usually reviews the scenario for the evaluators, and the state reviews what they and the local jurisdictions are expecting to demonstrate and simulate.

3.8.3 Comparative Analysis

Both CSM and REP exercise controllers and evaluators receive training in advance of the exercise. The Army's CSM controllers receive technical chemical surety training and attend a one-week training session immediately prior to the exercise. The REP evaluators receive training in a one-week course, which covers the regulatory, technical, and evaluation bases for REP exercise evaluation. The REP evaluators may receive refresher training just prior to an exercise in addition to the pre-exercise briefing.

3.9 COLLECTING EXERCISE DATA

During the course of exercise play, various types of data and information are collected for later use in assessing the adequacy of performance observed. This section reviews the mechanisms that ensure that the needed data are collected and presented in a usable format.

3.9.1 DA Chemical Surety Material Exercise Program

A generic observation form is used in SRF exercises.¹⁸ It asks the writer to categorize the subject of the observation into one of 10 functional areas. These are:

- Crisis management,
- Health services,
- Public affairs,
- Hazard assessment,
- Communications,
- Legal matters,
- Field operations,
- Security,
- Logistics, and
- Remedial operations.

The writer is asked to state what was observed and to amplify the observations (i.e., to discuss it, identify any references that bear on the observation, make a recommendation, and identify the organization most appropriate to effect the recommendation). The observation forms are collected by the exercise director and his staff and used as input for the after action report.

3.9.2 FEMA Radiological Emergency Preparedness Program

Exercise evaluation methodology (EEM) forms are completed by FEMA evaluators. These completed evaluation forms, along with detailed time lines compiled by each evaluator and consolidated into an overall time line of the exercise, become the record of the exercise results. The EEM forms are organized according to objective and ask questions in a "fill-in-the-blanks" format pertinent to each objective. The evaluator is asked to complete the evaluation form and to supply a written narrative describing the activities performed to fulfill the goals of the objective. Where problems are identified, the evaluator briefly describes the issue and proposes a recommended corrective action.

3.9.3 Comparative Analysis

Both CSM and REP exercise programs issue data collection forms to be completed by controllers and evaluators. The forms used during an SRFX are generic and provide space for controller descriptions of observed strengths or weaknesses and a recommendation on how to correct any weakness. The SRFX observation forms are also distributed to and retrieved from exercise players. The FEMA REP evaluators receive forms that are related to the specific objectives to be addressed, and capabilities to be demonstrated, at assigned evaluator locations. The questions on these forms also seek evaluator descriptions of observed weaknesses and a recommended corrective action.

4 EXERCISE ACTIVITIES

This section examines some activities that occur during an exercise. Because previous sections have addressed activities that occur before and continue into the exercise, such as exercise management, this section is relatively brief.

4.1 EXERCISE PARTICIPANT (EVALUATOR/OBSERVER/CONTROLLER) ROLES

During exercise play, participants perform various types of activities, each of which is critical to the success of the exercise. Exercise participants are divided into functional groups, each of which performs a different type of activity. The number of functional groups varies, as does the designation of each group, depending on the type and scale of the exercise and the needs of the exercise management team. This section examines the use of controllers, evaluators, observers, and other exercise participants in Army CSM and FEMA REP exercises.

4.1.1 DA Chemical Surety Material Exercise Program

In an SRF exercise, people are categorized as participants (players and controllers) and visitors? Insofar as everyone in the exercise is expected to contribute to its purposes, there are no observers. Participants include both players and controllers. Their responsibilities grow out of the policy decision by DA that training and improvement, not evaluation in the sense of rating individual performance, is the purpose of SRF exercises. Players respond to the exercise scenario; they may also submit observation forms. Controllers are responsible for three different tasks: assuring that the scenario is followed, putting MSEL injects into the exercise, and completing observation forms that identify significant strengths and weaknesses in the plan, equipment, and players. Visitors can include both DA and other agency personnel; at SRF-89, visitors received an escorted tour of a number of key response locations.

The AMCSFA considers appropriate controller conduct to be one of its primary responsibilities. Controllers are instructed extensively on their jobs during the week preceding the SRF exercise. They have great freedom to make their element of the exercise scenario as realistic as possible, including spontaneously assuming the identities of nonparticipants in order to allow exercise interactions to be carried to a logical conclusion. In particular, controllers are trained to creatively prompt players and, where necessary, to channel them onto paths dictated by the scenario without breaching its integrity but only through the use of MSEL injects or actors. In general, direct controller-player interaction is discouraged. In keeping with its underlying purpose as a no-fault exercise and training tool, emphasis is placed on completion of controller observation forms to identify systemic problems.

The training controllers gain in an SRF exercise is also one of the goals of the exercise. Most controllers are employed as professionals in the surety material field in some capacity. The AMCSFA regards the experience of watching their colleagues at other sites respond to an accident scenario as educational for the controllers. Indeed, the opportunity to assume the identity of someone outside the DA structure, someone players might encounter in a real accident, gives the controllers the chance to appreciate better the position of outsiders they might encounter in their own jobs. For example, the controller who played the lawyer representing civilian claimants from the Pine Bluff area against the attorneys from the Army Claims Office

established during SRFX-89 was himself a lawyer in the Judge Advocate General's office in real life. He had the opportunity to experience vicariously the difficulties of dealing with the DA bureaucracy during the exercise in a way his day-to-day responsibilities could not have provided. AMCSFA has kept its pool of controllers relatively small and confined to surety material professionals, in part to enhance this "cross training."

4.1.2 FEMA Radiological Emergency Preparedness Program

Each evaluator at a FEMA REP exercise is assigned to a site or function (e.g., "Town X" or "Field Team Monitoring") and arrives at the location specified for that assignment before the exercise begins. In some cases, an evaluator may have multiple assignments that require travel to two or more locations. After arrival, the evaluator spends the rest of the exercise watching what occurs and noting the specific times that actions are taken. These observations become the basis for completing the exercise modules, which summarize the evaluation of how the players functioned. Evaluators may ask as many questions as necessary to collect information that will help to determine if an objective has been met, but they may neither prompt the players in any way nor interfere with the players as they work. Frequently, the best advice to give an evaluator is that they should behave as a "fly on the wall," that is, as a passive observer of the events occurring.

The FEMA controllers also are not supposed to prompt the players or interfere with exercise play. Their primary function is to observe the exercise on behalf of the state and the licensee. The controllers often have pre-scripted messages to insert to stimulate play and demonstration, and they may insert messages on an ad hoc basis if the exercise is going very slowly and not fully testing the capabilities of the response organization.

Occasionally, an evaluator may also act as a controller if there is no controller assigned to a particular location. The evaluator may be assigned the responsibility of injecting pre-scripted messages, as in the case of small municipal EOCs where no controller is assigned. Alternatively, the evaluator may be expected to insert messages ad hoc if he or she feels that the players are not being fully tested by the scenario. This can occur in municipalities where it is not necessary to implement protective actions because the wind is blowing the plume in a different direction. Finally, where it is impossible to have controllers assigned to field monitoring teams, evaluators assigned to these teams may be required to provide the players with scenario data for the readings they would obtain in the field.

4.1.3 Comparative Analysis

The CSM and REP exercise programs differ in their definition and utilization of exercise participants. The Army's SRFX and quarterly installation exercises are not evaluated, whereas the FEMA REP program conducts formal evaluations by using people specifically trained for this purpose. Since many controllers in SRF exercises participate in other exercises as players, there is a very close bond between the two groups, and an exercise trains controllers nearly as much as the players. In contrast, FEMA controllers and evaluators are taught to be unobtrusive. Finally, only FEMA evaluators observe and make preliminary assessment as to the adequacy of player performance.

4.2 EXERCISE IMPACT ON THE PUBLIC

As mentioned earlier, it is FEMA's view that fully activated demonstrations of emergency response can be disruptive to the communities involved in exercises and can endanger public safety. Nevertheless, large-scale field exercises often result in deploying responders out into public areas to demonstrate various emergency activities. These might include the establishment of traffic control points or contamination control "hotlines" and having field monitoring personnel don protective clothing. Blocking a roadway to set up a contamination "hotline" may be appropriate in a low traffic area where traffic can be rerouted, but staffing that location with personnel in anticontamination clothing may unnecessarily alarm members of the public.

Because technological scenario topics tend to be controversial (e.g., nuclear power or chemical agents), and because a disruption of the public may be dangerous or arouse public concern, the extent to which the exercise is allowed to have an impact on the public varies. The following material describes the extent to which Army CSM and FEMA REP exercises affect the public.

4.2.1 DA Chemical Surety Material Exercise Program

An SRFX is a high-visibility exercise that will usually require Army personnel to conduct various response activities off-post, in full view of the public. Should the scenario call for munitions to be projected off-post, Army personnel will be involved in search and recovery activities that may require them to don full protective equipment and clothing. Army personnel, also in some sort of protective clothing, may staff contamination control points ("hotlines") beside well traveled roadways.

Depending on the extent of play parameters agreed to by participating off-post jurisdictions, actual members of the public may be involved in exercise play (e.g., school children evacuating a school and riding buses). At SRFX-89, members of the public volunteered to act as simulated casualties and rode buses to shelters and medical facilities.

Other factors considered in developing the off-post aspects of the scenario include the number of participating organizations, the availability of personnel and funding for off-post activities, and the level of public support for the installation's mission.

For SMRs and quarterly installation exercises, the public is not normally involved, and the impact of the exercise upon the public is usually negligible.

4.2.2 FEMA Radiological Emergency Preparedness Program

As mentioned before, FEMA tries to avoid disrupting the public during exercises. The off-site communities are informed that there will be an exercise and that public alerting sirens and an emergency broadcast system will be tested, if such activities occur in the scenario. Volunteers are frequently used for the demonstrations of evacuation, reception, monitoring, and decontamination. Sometimes roadblocks will actually be set up to demonstrate access control. Members of the public are sometimes telephoned by emergency managers to determine

whether they heard the sirens or would need emergency assistance because of a physical handicap. Otherwise, the state and municipalities prefer not to disrupt a populace.

4.2.3 Comparative Analysis

The public impact of exercises conducted under each program is negligible. Considerations for limiting off-post play during SRFX and other DA exercises include resource availability and extent of community support for the chemical surety mission. Limitations on the impact of REP exercises relate to participant and public safety and minimizing the disruption of routine delivery of public services.

5 POST-EXERCISE ACTIVITIES

The cessation of exercise play does not signal the end of exercise activities. This section describes activities occurring after exercise termination, from the compilation of exercise information through the integration of exercise "lessons learned" into plans.

5.1 POST-EXERCISE BRIEFINGS

Controller, evaluator, and general participant briefings may be conducted after the exercise to review exercise performance. These briefings are important because they allow all participants (players, controllers, and evaluators) to exchange information about the exercise prior to developing a formal assessment of how well exercise players performed.

For players, such a review furnishes timely feedback and can provide them with an opportunity to correct any misconceptions the evaluators may have developed during the exercise. These briefings also enable controllers and evaluators to recover critical pieces of information that they may have missed during exercise play. Post-exercise briefings are also valuable because they allow evaluators and controllers to develop an overall view of exercise play, which may be necessary to determine whether interagency coordination among participating organizations was adequate. This section describes the types of briefings that are conducted following Army CSM and FEMA REP exercises.

5.1.1 DA Chemical Surety Material Exercise Program

Post-exercise participant briefings, conducted at each participating organization or demonstration location, are usually not conducted. For installation exercises, conducted as a part of an SMR, exercise managers meet with installation representatives to review the preliminary assessment of IRF performance.

Throughout an SRF, the exercise director or functional area leaders may call controllers together to brief one another as the need arises, but this practice varies from exercise to exercise. A formal post-exercise critique is conducted for players and controllers? The critique consists of a briefing usually conducted by the installation and involving the general officer commanding the SRF, representatives from other components of the SRF, the installation commander, the installation's chemical surety officer, a representative from the state, and representatives from participating local governments. These briefings review the three most positive and three most negative lessons learned from the perspective of each organization's representative.

5.1.2 FEMA Radiological Emergency Preparedness Program

At many FEMA exercises, the evaluator holds an "exit interview" with the players who have been observed.¹⁴ A general overview of the demonstration is given; good aspects are praised and weaknesses discussed. No attempt is made to categorize an exercise performance inadequacy as a "deficiency" (a very serious shortcoming affecting public health and safety, usually requiring a remedial exercise) or as an "area requiring corrective action" (ARCA) (a less serious kind of shortcoming in and of itself but important to public health and safety). This

determination cannot be made until the composite picture of the exercise is obtained after analysis of all the observations. The "exit interview" is conducted at the discretion of the RAC chair.

Evaluator Debriefing. As soon as possible after the exercise (usually within 24 hours), the RAC chair holds a debriefing meeting with all exercise evaluators.¹⁴ The purpose is to develop an overview evaluation of the exercise in order to be able to brief the state, the licensee, and all the exercise participants. Again, the issues are not categorized. The severity of the problems observed is not finally determined until EEM forms are analyzed and the post-exercise assessment report is drafted.

In preparation for this meeting, FEMA team leaders will have already met with their teams to determine what the evaluators have observed. The team leaders, then, present the findings of the team at the debriefing. Clarification of a point may be sought from a team member by the RAC chair, if necessary.

Before, or sometimes during, an evaluator debriefing meeting, the exercise coordinator, with the help of the team leaders, will prepare a "time line" chart indicating when important milestones in the exercise were reached at each location. This information is critical to determining if sufficiently rapid response was demonstrated.

After the meeting, the exercise coordinator, who acts as a recorder for the debriefing, presents the RAC chair with a summary of the issues presented; the RAC chair is then prepared to meet with the NRC (on-site) team leader.

FEMA/NRC Coordination. The RAC chair and the NRC team leader meet after their respective evaluator team debriefings to compare notes and prepare to brief the exercise participants.

Exercise Participant Briefing. Within 48 hours after the exercise, a briefing involving the exercise participants, RAC chair, NRC representative, and other RAC members and federal evaluators, as appropriate, is held to discuss the preliminary results of the exercise.⁴ Again, no "bottom line" finding is presented. Rather, this briefing is conducted in order to discuss the issues that have been tentatively identified and to receive input from the players concerning the accuracy of these issues. Where possible, the corrective actions to resolve these issues are discussed in order to include the perspective of state and local players in the development of the recommended corrective actions that will be documented in the post-exercise assessment report.

5.1.3 Comparative Analysis

The CSM exercise program staff conducts participant debriefings following an SMR. A post-exercise meeting following an SRFX is usually limited to a participant critique involving representatives from selected participating organizations and units. Briefings and meetings following FEMA REP exercises are conducted for participants (at or near the plant site), evaluators, representatives of participating organizations, and the public.

5.2 PUBLIC AWARENESS OF EXERCISE RESULTS

Providing the public with information about exercise results is one means of increasing the acceptance of an effective emergency preparedness program. This section examines the mechanisms used in the CSM and REP exercise programs to provide exercise information to and receive feedback from the public.

5.2.1 DA Chemical Surety Material Exercise Program

The public usually is not invited to attend the post-exercise critique following an SRFX, and representatives of the media do not participate in press briefings held during the course of the SRFX (actors represent the media). There is, however, a mechanism for getting information about the exercise to the public. Installation PAOs do make information on exercise activities available to the local media, but, during an SRFX, a special representative is designated to respond to inquiries about the exercise from the real media.¹⁶

5.2.2 FEMA Radiological Emergency Preparedness Program

For exercises held as part of the "qualifying" (licensing or approval under 44 CFR 350) process, a public meeting is held as soon as possible after the exercise in the vicinity of the power plant.⁵ The meeting is preceded by published notices in the local media, and exercise participants, representatives from the NRC, and other appropriate federal, state, and local agencies are expected to attend. The purpose of the meeting is to acquaint members of the public with the state and local emergency plans and the results of the exercise, possibly including whether any deficiencies were observed, and to answer any questions on the part of the public.

The public critique held after a biennial exercise for continued FEMA approval is much the same; however, it occurs sooner (usually right after the exercise participant briefing) and does not characterize problems identified or observed as "deficiencies" or "areas requiring corrective action" at this point. A question-and-answer period is held, and the panel, which includes representation from FEMA, the NRC, the state, and the licensee, is available to respond.

5.2.3 Comparative Analysis

Current CSM exercise practices do not include a formal mechanism for furnishing information about exercise results to the public. During an SRFX, a special media representative handles inquiries from the real press. Public meetings following REP exercises are mandated as a component of the nuclear power plant licensing process.

5.3 POST-EXERCISE ASSESSMENT AND REPORTING

Individual evaluator and controller observation or evaluation forms are usually collected, reviewed, and assimilated into a cohesive and comprehensive exercise report. This document then becomes a permanent record of the participants' performance, identifying lessons

learned during the exercise. The following subsections discuss how post-exercise reports are compiled following Army CSM and FEMA REP exercises.

5.3.1 DA Chemical Surety Material Exercise Program

At the conclusion of the exercise, the exercise director collects the completed observation forms and the process of drafting an after action report begins. AMCSFA staff compile the observations, edit them, make such additional inquiries as they deem appropriate, and develop a draft report. The draft report is distributed to key on-post personnel and a meeting is then held to edit the draft. This second draft becomes the after action report on the exercise.

The report itself consists of two volumes.²² Volume I is an executive summary that describes the SRF program, explains the exercise objectives, and presents the most significant conclusions from the exercise according to functional area. It encourages that comments be sent to the AMCSFA director. Volume II is lengthier, containing edited versions of the individual observation forms that were submitted after the exercise, organized according to functional area. After action reports are stamped "for official use only," which limits their distribution.

In keeping with the objectives of the SRF exercise program, the report focuses on exemplary performances, planning weaknesses that were revealed by the exercise, and the results of new planning concepts that were tested at the exercise. It also is a single source of current chemical weapons accident response program issues, addressing all questions identified in prior SRF exercises; these are either documented in the report or are to be treated as resolved.

5.3.2 FEMA Radiological Emergency Preparedness Program

After all the exercise modules have been collected and all the debriefings and meetings held, the exercise coordinator begins to oversee the analysis of the written reports in order to prepare the post exercise assessment report. A post exercise assessment includes:

- A summary of the observations.
- A list of evaluators and their assignments.
- The exercise objectives.
- A summary of the scenario.
- A chart showing times when significant events occurred (the "time line").
- A narrative description of the state and local functions, including a listing of any deficiencies, areas requiring corrective action and areas recommended for improvement, and FEMA's recommendations for correction.
- A schedule for correction of deficiencies and areas requiring corrective action.

- Tables that may contain remedial actions (for one exercise only), tracking data (showing all past deficiencies and ARCA's and their corrective actions and dates), and status of objectives.

All final reports are released to the public, disseminated to all of the participants, placed in local libraries, and made available to special interest groups.

5.3.3 Comparative Analysis

The Army labels an SRFX after action report "For Official Use Only" and does not generally make it available to the public. SRFX reports contain a compilation of all observation forms submitted following the exercise. Final REP exercise evaluation reports are available to the public. These reports include simplified scenario information, a time line of significant exercise activities, and assessments of participant performance relevant to the exercise objectives.

5.4 USE OF LESSONS LEARNED

Exercises frequently identify shortcomings in participant performance, plans, or capabilities. These "lessons learned" may involve the need for (1) additional decision-maker or responder training, (2) equipment maintenance or additional equipment, or (3) revision of emergency response plans or procedures. This section describes how lessons learned from Army CSM and FEMA REP exercises are integrated into planning processes.

5.4.1 DA Chemical Surety Material Exercise Program

Following an SRFX, an AAR is developed and distributed to commanders of all participating Army agencies, offices, installations, major subordinate commands, and AMC headquarters.²¹ These reports are reviewed, and appropriate planning personnel are directed to make recommended changes within the limits of existing budgetary and resource constraints.

Lessons learned from an SRFX are quickly integrated into training activities conducted by USADACS, a major source of surety material training for the Army. The USADACS involvement in the planning, conduct, and assessment of an SRFX allows USADACS staff to retrieve valuable information from the exercise and, when appropriate, modify the Army curriculum to reflect that newly gained experience.

At the installation level, responsibility for correcting weaknesses falls to the commander, but a member of the installation's planning staff is usually assigned the duty of coordinating any planning, procedural, or equipment modifications needed.

Following an SMR, a detailed report identifying the areas of strength and weakness in the installation's surety program is prepared and submitted to the installation. The installation must respond by endorsement, through the appropriate chain of command, to selected issues identified in the SMR report, indicating what corrective actions will be taken. Should it be needed by the installation, AMCSFA furnishes technical assistance to formulate a plan for correcting weaknesses identified. Working through the chain of command, the installation notifies AMCSFA when the corrective action has been completed.

5.4.2 FEMA Radiological Emergency Preparedness Program

The issues and weaknesses observed in an exercise are analyzed and recommendations made for their correction. These recommendations may include changes in plans and procedures, additional training of emergency workers, or additional equipment for emergency workers and facilities.

If the state or licensee feels that FEMA's recommendations for improvement are unreasonable or inappropriate, they have the opportunity to comment at the exercise participant briefing or while the exercise report is being prepared. FEMA is willing to discuss remedial actions and may change a recommendation if the state or licensee has a better idea. Once the report with its recommendations is in final form, however, the state and the licensee are required to correct the issues and weaknesses identified within a certain time frame, which they provide in return on the schedule of corrective actions. The achievement of these corrective actions is demonstrated by means of revised plans and procedures that are submitted for review or by means of demonstrating capabilities at either a remedial exercise (in the case of deficiencies) or at the next biennial exercise (in the case of areas requiring corrective action).

5.4.3 Comparative Analysis

Responsibility for tracking exercise issues and corrective actions identified in SRFs falls to installation commanders and is not a formal component of the CSM exercise program. For SMRs and other DA inspections, the tracking of identified weaknesses and corrective actions is required. FEMA REP exercise issues and corrective actions are tracked routinely. The status of the corrective actions is included on a chart that is updated continuously and is an integral part of each exercise assessment report.

6 RECOMMENDATIONS FOR DEVELOPING A JOINT, INTEGRATED DA/FEMA EXERCISE PROGRAM

Under the CSEPP, the Army and FEMA seek to develop an integrated exercise program that emerges from their respective expertise and programs. This section reviews differences in the DA CSM and FEMA REP exercise programs and suggests how these differences might be blended to develop an integrated approach to exercises for the CSEPP.

6.1 EXERCISE SCALE AND FREQUENCY

Current CSEPP planning guidance identifies types of exercises and the frequency with which each should be conducted. Those developing CSEPP strategy should consider planning exercises to coincide with those exercise activities already being conducted by Army installations. Installation liaisons to off-post organizations could participate in drills and tabletop exercises conducted off-post. During functional exercises conducted off-post, installation liaisons should probably participate, and the exercise should include testing of alerting and notification systems, protective-action decision making, emergency communications, and other critical linkages. Participation would be beneficial for decision-making personnel at the installation in functional exercises conducted off-post; such participation would enable decision makers to provide input for and receive feedback from off-post organizations.

Making a full-scale exercise correspond with an SRFX, when feasible, would provide valuable experience for installation personnel in terms of interacting with AMC headquarters, other Army organizations, and other federal agencies. When not scheduled around an SRFX, annual full-scale exercises could be scheduled to coincide with quarterly installation exercises. The development of exercise schedules will require considerable coordination among the various participants in CSEPP.

6.2 EXERCISE OBJECTIVES

Draft CSEPP planning guidance specifies that exercises should have clearly stated objectives. It is suggested that a standard set of exercise objectives for off-post exercise play be developed, with each objective linked to a component of emergency response (such as emergency communications). The development of overall CSEPP objectives does not preclude the development of specific Army exercise objectives by an installation and, as appropriate, by AMCSFA. A single set of CSEPP objectives would enhance the credibility of CSEPP exercises -- it would be one component of assessing the adequacy of preparedness.

6.3 EXTENT OF EXERCISE PLAY

The involvement of off-post governments and organizations in CSEPP exercises will require a basis for agreement on the extent of play that is flexible enough to accommodate the need for some simulation of off-post activities (such as the evacuation of populations). This need not affect the extent of play on-post, except, perhaps, where on-post personnel may be sent off-post to perform emergency response activities (e.g., public affairs or field monitoring). At the same time, the extensive realism now engendered by the Army's use of actors and props,

especially in public affairs, is a positive contribution to the exercise process that should be retained. A set of common DA/FEMA procedures could be developed for determining the extent of play for each exercise as it is planned.

6.4 SCENARIO DEVELOPMENT

Exercise planning should include a scenario development committee involving state and installation representatives; scenarios thus developed would address the needs of all parties. Technical assistance could be available during development through the appropriate FEMA regions and DA technical organizations such as AMCSFA and USADACS. Scenarios developed could be submitted to designated FEMA and DA staff for review. Revisions recommended by FEMA and DA reviewers could then be incorporated and the final scenario approved by FEMA and DA staff.

6.5 EVALUATOR TRAINING

Consistent with the draft CSEPP guidance, a team of trained evaluators should critique CSEPP exercises. Evaluators should receive training that provides information on (1) purpose of the CSDP and its relationship to the CSEPP, (2) the CSEPP planning guidance, (3) the integrated DA/FEMA exercise strategy, (4) the nature of the potential threat posed by chemical agents, and (5) the use of exercise evaluation forms (see Sec. 6.6) to collect player performance data during a CSEPP exercise. Location-specific evaluator training should be conducted, just prior to the exercise, to provide information that is unique to that specific exercise location.

6.6 DATA COLLECTION

Standardized evaluation forms should be developed and used to collect exercise performance data for on-post and off-post exercise play. Evaluation forms with unique demonstration criteria for each objective should be considered. FEMA's Hazardous Material Exercise Evaluation Methodology forms constitute a prototype form that may be considered for use in evaluating CSEPP exercises. The DA may need to continue using its own observation forms, but it should also be involved in the development of evaluation forms to be used by Army and FEMA personnel during full-scale CSEPP exercises.

6.7 CONTROLLER/EVALUATOR ROLES

The DA and FEMA should agree upon common definitions of exercise participant roles and responsibilities. If the DA is to initiate a system of evaluating on-post performance, it may make sense to separate the control and observation functions, both of which are currently performed by DA controllers; the FEMA system of separating controllers and "fly on the wall" evaluators would appear to meet this need. At the same time, greater realism and cross training would be promoted throughout the exercise process if controllers keep the freedom to assume different identities, a freedom they presently have in the Army's SRF exercises.

6.8 EXERCISE REPORTING

Post-exercise evaluation reports should be developed for each evaluated full-scale exercise conducted under the CSEPP. Reports should identify performance strengths and deficiencies (or inadequacies) and recommend corrective actions. Previous exercise inadequacies should also be tracked in the report. Final exercise reports should be made available to the public. The development of the report should be a joint responsibility of the Army and FEMA. Reporting protocols for smaller-scale CSEPP exercises should also be considered.

6.9 POST-EXERCISE PUBLIC MEETINGS

Draft CSEPP planning guidance requires that full-scale exercise results be presented at public meetings. After such exercises, a public discussion of the strengths and weaknesses of on-post and off-post capabilities in planning and preparedness would be held for the purpose of enhancing public support for the CSEPP. An opportunity for public questions and comments at such meetings would encourage dialogue on issues of local concern. A decision to conduct this type of open meeting may need to be weighed, however, against location-specific public concerns, which a public meeting might actually heighten (but which the exercise is intended to allay).

6.10 SUMMARY

In summary, the experience gained in the Federal Emergency Management Agency REP program and the Department of the Army's chemical surety exercises can be used for the benefit of the Chemical Stockpile Emergency Preparedness Program. Although the hazards being planned for by the Army and FEMA have some significant differences, there are enough similarities to warrant inclusion of lessons learned from both programs in the CSEPP being developed. The suggestions outlined above are intended to focus discussions on which aspects of the respective programs merit inclusion in the CSEPP. The planning process will determine which elements of these programs would work for the CSEPP and which would not. Emergency planning, in any case, is never finished; rather, it is an ongoing process of definition and redefinition, trial and refinement, with the planning results intended to provide the greatest possible protection of the public and the environment during chemical emergencies.

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