Program Manual

Radiological Emergency Preparedness

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FEMA

Administrator's Foreword

FEMA's Radiological Emergency Preparedness (REP) program evolved in size and scope and has adapted to structural and mission changes by incorporating new operations and organizations, transferring functions as necessary, while still maintaining the public health and safety surrounding a nuclear power plant. Regardless of how our mission and structure have changed, the fundamental character, inspiration, and motivation of the REP Program remains the same: The desire to serve our Nation by helping our people and first responders, especially when they are most in need.

As we continue to improve FEMA's REP Program, we must view all the work FEMA does in concert with the emergency management community as part of a broad plan for addressing the demands and challenges of a catastrophic disaster. To ensure our efforts become part of an interconnected plan of action, we are focused on our "Whole Community" initiative. This initiative will continue to effectively leverage the capabilities both governmental and non-governmental entities play in preparing for a catastrophic disaster. "Whole Community" uses planning assumptions for catastrophic disasters based on the worst case scenarios. These scenarios challenge preparedness at all levels of government and force innovative non-traditional solutions as part of the response strategy to such events. As the name of the initiative indicates, it is truly the *whole* community that must be prepared to respond in ways that extend beyond the previous paradigms in which we have traditionally operated.

While preparedness is critical in saving and sustaining lives, the "Whole Community" approach spans not only prevention and protection before a disaster, but also recovery, response operations, and mitigation activities that occur before, during, and after a catastrophic event. Our experiences helped us realize and appreciate the important role that State, local, and Tribal governments play in disaster preparedness, response, and recovery. FEMA's success with the REP Program is heavily dependent upon our ability to communicate, coordinate, and work closely together building on the strengths of local communities and citizens and integrating the public as a critical resource.

Each emergency preparedness plan addresses unique considerations that exist in the event of a catastrophic incident at a commercial nuclear power plant. We believe that your radiological emergency response plans are a part of your comprehensive emergency management program. This provides a "Whole Community" approach to strengthen your community's preparedness against any catastrophic event.

Most importantly, we know of the great capacity of individuals to care for their families, friends, neighbors and fellow community members, making our citizens force multipliers rather than liabilities. Together, we make up the "Whole Community," and we all have an important role to play. We must engage all of our societal capacity, both within and beyond FEMA, to work together as a team.

W. Craig Fugate
Administrator

Contents

PART I: Introduction to the Radiological Emergency Preparedness Program Manual 1

A. Mission Statement 1

B. Purpose 1

C. Scope 3

D. Basis of the REP Program 4

1. Establishment of the REP Program 4
2. Programmatic Changes 5

E. Evaluation of Radiological Emergency Preparedness 8

1. NRC-FEMA Memorandum of Understanding 8
2. Specific FEMA Review and Approval Procedures 8
3. Federal Delegation of Tasks 9
4. Planning And Preparedness Assessment Strategy 10

F. Technical Basis for the REP Program 11

1. Nature of the Hazard 11
2. Protective Actions to Reduce Exposure to Radiation 12
3. Protective Action Guides 12
4. Emergency Planning Zones 14
5. Radiological Incident Phases 15

PART II: REP Program Planning Guidance 16

A. Introduction 16

1. Purpose and Scope 16
2. Contents and Organization 16

B. Planning Standards 17

C. Planning Standards-Core Capability Crosswalk 18

D. Planning Guidance 20

1. Planning Standard A – Assignment of Responsibility (Organization Control) 20
2. Planning Standard B – Onsite Emergency Organization 29
3. Planning Standard C – Emergency Response Support and Resources 31
4. Planning Standard D – Emergency Classification System 37
5. Planning Standard E – Notification Methods and Procedures 39
6. Planning Standard F – Emergency Communications 50

7. Planning Standard G – Public Education and Information . . . 55
8. Planning Standard H – Emergency Facilities and Equipment . . . 68
9. Planning Standard I – Accident Assessment . . . 75
10. Planning Standard J – Protective Response . . . 84
11. Planning Standard K – Radiological Exposure Control . . . 107
12. Planning Standard L – Medical and Public Health Support . . . 119
13. Planning Standard M – Recovery and Reentry Planning and Post-Accident Operations . . . 124
14. Planning Standard N – Exercises and Drills . . . 128
15. Planning Standard O – Radiological Emergency Response Training . . . 140
16. Planning Standard P – Responsibility for the Planning Effort: Development, Periodic Review and Distribution of Emergency Plans . . . 147

Part III: REP Program Demonstration Guidance . . . 152

A. Introduction . . . 152
1. Contents and Organization . . . 152
2. Background . . . 152

B. REP Exercise Process . . . 153
1. Scheduling REP Activities . . . 155
2. Conducting Preplanning Activities . . . 163
3. Developing REP Exercise Documents . . . 166
4. Holding Exercise Planning Meetings . . . 167
5. Conducting REP Exercises . . . 168
6. Documenting REP Exercises . . . 170
7. REP Program Credit for Participation in Actual Incidents . . . 175

C. Exercise Demonstration . . . 177
Assessment Area 1: Emergency Operations Management . . . 179
Assessment Area 2: Protective Action Decision-Making . . . 183
Assessment Area 3: Protective Action Implementation . . . 188
Assessment Area 4: Field Measurements And Analyses . . . 194
Assessment Area 5: Emergency Notification And Public Information . . . 197
Assessment Area 6: Support Operations/Facilities . . . 201

Part IV: FEMA REP PROGRAM ADMINISTRATION . . . 205

A. Introduction . . . 205

B. Regulatory Summary . . . 206
1. 44 CFR Part 350 – Review and Approval of State and Local Radiological Emergency Plans and Preparedness . . . 206

2. 44 CFR Part 351 – Radiological Emergency Planning and Preparedness 214
3. 44 CFR Part 352 – Commercial NPP: Emergency Preparedness Planning 214
4. 44 CFR Part 353 – Fee for Services in Support, Review, and Approval of State and Local Government or licensee Radiological Emergency Plans and Preparedness 214
5. 44 CFR Part 354 – Fee for Services to Support FEMA's Offsite REP Program 215

C. Non-participating State, Tribal, and Local Governments (NUREG-0654/FEMA-REP-1, Supplement 1) . . . 216

D. Early Site Permit Applications (NUREG-0654/FEMA-REP-1, Supplement 2) 216

E. Protective Action Strategies (NUREG-0654/FEMA-REP-1, Supplement 3) 217

F. Exercise Methodology, More Challenging Drills and Exercises, and Backup Alert and Notification Requirements (NUREG-0654/FEMA-REP-1, Supplement 4) 218

G. Demonstration Considerations for No/Minimal Release Scenarios 219

H. Integration of REP Demonstration Criteria and Core Capabilities 224
1. Demonstration Criteria-Core Capability Crosswalk 224
2. Exercise Evaluation Guides 227
3. Customizing EEGs for an Exercise 227

I. Submitting Best Practices on the FEMA Website 228

J. Approval Process for Alternative Approaches 233
1. Initial submission 233
2. Regional Recommendation 233
3. FEMA Headquarters Approval 233
4. Alternative Approach Demonstration 234

K. Emergency Planning Zone Boundary Changes 234

L. Credentialing Framework 235

M. Use of State, Local, and Tribal Personnel as REP Exercise Evaluators 235
1. Administrative Process 235
2. Host Region Responsibilities 236
3. Evaluator Responsibilities 236
4. Evaluator Employer Commitment 236
5. Conditions 236

N. Tribal Policies and Procedures 236
1. Federally Recognized Tribal Nations and the REP Program 236
2. Policy 236

O. Staff Assistance Visits (SAVs) 237

P. Evacuation Time Estimates 237

Q. Potassium Iodide for the Public . . . 238

R. Conducting Plan Reviews . . . 238
1. Radiological Emergency Preparedness Plans/Procedures . . . 238
2. Division of Functions and Applicability of Criteria . . . 239
3. Format for Plan Reviews . . . 240

S. Conducting Scenario Reviews . . . 242
1. Scenario Review Preparation . . . 242
2. Radiological Emergency Preparedness Exercise Scenario Review Checklist . . . 244

T. Annual Letter of Certification (ALC) . . . 246
1. Guidance . . . 246
2. Sample Annual Letter of Certification Cover Letter . . . 247
3. Annual Letter of Certification (ALC) Review Guide . . . 248

U. Public Information Guide and Process . . . 255
1. Guidance . . . 255
2. Review Steps . . . 255
3. Foreign Language Translation – Legal Requirements and Location of Information . . . 260

V. Disaster Initiated Review . . . 261

Part V: Supplemental Guidance . . . 262

A. Alert and Notification Systems . . . 262
1. Background . . . 262
2. FEMA Evaluation of ANS . . . 263
3. Evaluation Report Template . . . 266

Index . . . 316

List of Appendices

Appendix A: Abbreviations and Acronyms Used in the REP Program . . . 270
Appendix B: Glossary of REP Terms . . . 277
Appendix C: REP Guidance References . . . 303
Appendix D: Historical REP Guidance References . . . 306
Appendix E: List of Commercial Nuclear Power Plants . . . 314

List of Exhibits

Exhibit I-1: Probable Early Effects of Acute Radiation 12
Exhibit I-2: EPZ Characteristics 14
Exhibit II-1: NUREG-0654/FEMA-REP-1 Planning Standards-Core Capabilities Crosswalk 18
Exhibit II-2: Sample Functional Responsibilities Matrix/Table 25
Exhibit II-3: Design Objectives for Alert and Notification of the Public 45
Exhibit III-1: Milestones for the REP Exercise Process 154
Exhibit III-2: Federal Evaluation Process Matrix 158
Exhibit III-3: Illustration of the Standard Exercise Issue Number 171
Exhibit III-4: Evaluation Standards for Alert and Notification Systems 197
Exhibit IV-1: Plan Review Responsibilities for RAC Agencies 207
Exhibit IV-2: Considerations for Demonstrating the 10 Criteria during a No/Minimal Release Scenario 220
Exhibit IV-3: Demonstration Criteria-Core Capabilities Crosswalk 225
Exhibit IV-4: Best Practice Submission Form 229
Exhibit IV-5: Photographic/Video/Audio Consent & Release 231
Exhibit IV-6: Photographic/Video/Audio Parental Consent & Release 232
Exhibit IV-7: Plan Review Responsibility 240
Exhibit IV-8: Plan Review Format 241
Exhibit IV-9: Scenario Review Process 242
Exhibit IV-10: Public Information Review Checklist 256

Disclaimer

This policy represents the Federal Emergency Management Agency (FEMA) Radiological Emergency Preparedness (REP) Program's interpretations of a statutory or regulatory requirement. The policy itself does not impose legally enforceable rights and obligations, but sets forth a standard operating guideline or agency practice that FEMA employees follow to be consistent, fair, and equitable in the implementation of the Agency's authorities.

FEMA undertook substantial efforts to ensure that this manual incorporated all applicable Radiological Emergency Preparedness (REP) Program policy and guidance. FEMA will review changes to other Federal Agency guidance that impacts the REP Program and issue updates to this manual as warranted.

PART I: Introduction to the Radiological Emergency Preparedness Program Manual

A. MISSION STATEMENT

The REP Program coordinates the National effort to provide State, local, and Tribal governments with relevant and executable planning, training, and exercise guidance and policies necessary to ensure that adequate capabilities exist to prevent, protect against, mitigate the effects of, respond to, and recover from incidents involving commercial nuclear power plants (NPPs).

The program assists State, local, and Tribal governments in the development and conduct of off-site radiological emergency preparedness activities within the emergency planning zones (EPZs) of Nuclear Regulatory Commission (NRC)-licensed commercial nuclear power facilities.

REP's historical success lies in its ability to integrate and enhance Federal, State, Tribal, and local governments' preparedness planning and response capabilities for all types of radiological emergencies.

B. PURPOSE

This manual serves as the principal source of policy and guidance for the FEMA REP Program.

Federal regulations in 44 Code of Federal Regulations (CFR) Part 350 address FEMA's role in conducting assessments and issuing findings regarding offsite emergency plans/procedures for responding to radiological emergencies at commercial NPPs.

State, local, and Tribal government participation in offsite radiological emergency planning and preparedness is voluntary. However, participation in the REP planning and preparedness process necessitates adherence to the program requirements as set forth in 44 CFR Part 350, the joint NRC/FEMA document NUREG-0654/FEMA-REP-1[1], and this REP Program Manual. If State, local, or Tribal governments choose not to participate in REP planning, 44 CFR Part 352 outlines the licensee's obligation to develop offsite plans/procedures to protect the public health and safety.

The elements of NUREG-0654/FEMA-REP-1 are REP Program requirements for offsite response organizations. In addition to the 16 Planning Standards for radiological emergency preparedness, 44 CFR § 350.5 incorporates by reference NUREG-0654/FEMA-REP-1, which includes associated Evaluation Criteria that further define the Planning Standards. The 16 Planning Standards and associated Evaluation Criteria set the standard that FEMA uses to assess offsite planning and preparedness.

NUREG-0654/FEMA-REP-1 Requirement

It is FEMA's position that, unless an alternative approach is proposed and accepted, the associated Evaluation Criteria must be met.

Shall and should: The terms *shall*, *must*, and *require* denote mandatory items originating in regulatory material including NUREG-0654/FEMA-REP-1 and the CFR. The terms *should*, *suggest* and *recommend* denote guidance outlining a Federally-approved means of meeting the intent of the REP regulations. The term *may* denotes an option, neither required nor necessarily recommended. The only exception to this is Planning Standard G where *should* is quoted in regulatory language.

[1] Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants, NUREG-0654/FEMA-REP-1, Rev. 1, cited herein as "NUREG-0654/FEMA-REP-1."

Alternative approaches. The Evaluation Criteria listed in NUREG-0654/FEMA-REP-1, as interpreted and applied by the NRC, FEMA, and other Federal agencies, represent approved approaches for meeting the intent of the Planning Standards. Offsite response organizations (OROs) may provide written proposals for alternative approaches to meeting the Evaluation Criteria to the appropriate FEMA Regional Office. The FEMA Regional Offices will review the proposal and forward its recommendations to FEMA Headquarters for review and approval. The review of proposals will include the Regional Assistance Committee (RAC). FEMA will also coordinate with the NRC and licensees when the alternate approach may affect onsite planning and preparedness.

Reasonable Assurance. In the communities surrounding commercial nuclear power plants, 44 CFR 350.5 (b) directs FEMA's REP Program to review State and local radiological emergency plans and preparedness. Approved plans and preparedness "must be determined to adequately protect the public health and safety by providing reasonable assurance that appropriate protective measures can be taken offsite in the event of a radiological emergency."

FEMA defines reasonable assurance as a determination that State, local, Tribal, and utility offsite plans and preparedness are adequate to protect public health and safety in the emergency planning areas of commercial nuclear power plants. FEMA will consider plans, procedures, personnel, training, facilities, equipment, drills, and exercises, which in its professional judgment are important to the effective implementation of protective measures offsite in the event or any incident at a commercial nuclear power plant.

FEMA will make its adequacy determination, supported by other Federal agencies, as necessary, by conducting inspections, providing staff assistance visits (SAVs), organizing, conducting and reviewing training, participating in, observing and evaluating drills and exercises, and by being an engaged partner with Federal, State, local, and Tribal government officials and industry stakeholders.

In making its reasonable assurance determination, FEMA will be guided by the standards, criteria, and policy found in applicable laws, regulations, and contemporary emergency preparedness guidance as follows: 10 CFR 50 and 10 CFR 52, 44 CFR 350 and 44 CFR 353, NUREG-0654/FEMA-REP- I, Rev. 1 (and Supplements), and the REP Program Manual. Contemporary emergency preparedness guidance includes the National Planning Frameworks, the National Preparedness Goal and System, Comprehensive Preparedness Guide (CPG) 101, the core capabilities, the National Incident Management System (NIMS) and Incident Command System (ICS), the Homeland Security Exercise and Evaluation Program (HSEEP) and the Integrated Planning System.

Where improvements or corrections are needed, FEMA will work closely with Federal, State, local, and Tribal government officials and industry stakeholders to resolve the issue(s).

Planning and Preparedness Assessment Strategy. The REP Program currently relies on a combination of exercises, SAVs, plan reviews, and an Annual Letter of Certification (ALC) to develop a recommendation of reasonable assurance. Over the course of the last 30 years, the reasonable assurance assessment began to rely on the biennial exercise over the other components. The REP Program Manual includes guidance that allows for an ongoing assessment approach through evaluation of a broader range of activities than those previously used. The Manual's guidance is consistent with national preparedness initiatives and HSEEP, and continues the streamlining of Federal, State, and local efforts and resources with the goal of employing a common assessment strategy.

One-stop reference guide. FEMA maintains this document for use by its stakeholders as a desk reference when they need to answer questions or receive clarification on REP planning, exercises, and administrative procedures. This version of the REP Program Manual incorporates previously issued FEMA guidance memoranda, policy memoranda, and some FEMA-REP series documents. This updated manual effectively retires incorporated documents from use as independent resources. Retired guidance documents appear in Appendix D as historical resources. The REP Program Manual retains active guidance documents on specific technical areas such as the FEMA-REP series documents and other REP Program documents too lengthy to incorporate as stand-alone references. Appendix C lists these stand-alone references and the manual cites them where applicable. To the greatest extent possible, FEMA will issue all future REP Program guidance as amendments to the applicable parts of this manual.

C. SCOPE

This manual provides FEMA guidance that interprets the Planning Standards and Evaluation Criteria in NUREG-0654/FEMA-REP-1 and 44 CFR Part 350. This guidance provides additional detail to OROs on what FEMA expects them to include in their radiological emergency response plans. This manual also provides the Demonstration Criteria that FEMA uses to evaluate the ability of the OROs to implement their radiological emergency response plans. Lastly, this manual provides additional information and guidance to help FEMA staff and OROs perform various REP Program functions (e.g., checklists, templates, references, etc.).

Communities potentially affected by a radiological incident at a nearby commercial NPP benefit from essential planning and preparedness activities. FEMA created the REP Program to address the unique needs of OROs. FEMA reviews and approves ORO planning and preparedness activities before the NRC issues a license to operate an NPP. FEMA also provides ongoing certifications that planning and preparedness efforts remain effective and consistent with relevant regulations.

The term "ORO" refers to a State, Tribal, and/or local government, a licensee emergency response organization (in certain circumstances), and any other supporting organization acting to protect the health and safety of the public offsite (beyond the NPP site boundary). Only the licensee emergency response organization is responsible for activities onsite (within the NPP site boundary). The REP Program Manual uses the term "ORO" or "OROs" instead of specifying State, Tribal, and/or local governments, because FEMA acknowledges that local authorities vary from State to State; certain REP activities may be the responsibility of the State in one instance and local jurisdictions in another. The REP Program Manual guidance applies to the entities responsible for the function being discussed.

The term "plans/procedures" as used in this manual includes radiological emergency preparedness and response plans, associated implementing procedures such as Standard Operating Guidelines (SOGs), and other supporting and referenced materials. FEMA may review all of these documents to the extent necessary in order to determine whether they meet the intent of the requirements. FEMA uses the generic term "plans/procedures" specifically for flexibility. The ORO may either incorporate procedural detail into its main plans or into separate procedural documents at its discretion.

This manual is divided into five main parts and includes additional appendices.

Part I introduces the REP Program and provides an overview. It provides the history and establishment of the REP Program, a description of the review process, and the technical basis for the program. This section provides base knowledge about the REP Program and describes current operations through a synopsis of its evolution.

Part II contains the NUREG-0654/FEMA-REP-1 Planning Standards and Evaluation Criteria, along with explanations and guidance on materials to be included in ORO plans/procedures. These explanations are solely guidance and neither exceed nor replace any FEMA or NRC regulations.

Part III of the REP Program Manual supplements the HSEEP process and provides specific guidance unique to the design, development, conduct, evaluation, and improvement planning associated with REP exercise activities. FEMA created this guidance for REP controllers, evaluators, contractors, and any Federal, State, local, or Tribal agencies responsible for planning, preparing, and executing exercises that are used to validate REP Program requirements. This section provides licensee partners with guidelines regarding how the Federal government will coordinate exercise activities in conjunction with the REP Program.

Part IV presents supporting reference documentation, where specific information is found in support of the program. It includes information on Potassium Iodide (KI) and Disaster Initiated Reviews (DIRs), scenario reviews, plan reviews, the ALC, and other topics.

Part V contains supplemental guidance that is not covered in the Manual's other Parts. It presents information regarding the evaluation of Alert and Notification Systems (ANS), which was previously captured in the Guide for the Evaluation of Alert and Notification Systems for Nuclear Power Plants (FEMA REP-10).

The appendices include acronyms, a glossary, and additional REP reference documents.

D. BASIS OF THE REP PROGRAM

This section provides an overview of the legislative mandates and guidance for the REP Program, describes its establishment, and details the impact of post-September 11, 2001 and post-Katrina programmatic changes.

1. Establishment of the REP Program

The NRC is responsible for emergency preparedness at the Nation's commercial NPPs. Following the March 1979 Three Mile Island accident, Executive Order 12148 and the Presidential Directive of December 7, 1979 transferred the Federal lead role in offsite emergency planning and preparedness activities from the NRC to FEMA. This assignment aligned with FEMA's statutory role in promoting, funding, coordinating, and providing technical assistance for disaster preparedness, as defined in Section 201 of the Disaster Relief Act of 1974.[2] FEMA established the REP Program to manage its responsibility for ORO emergency planning and preparedness in areas around commercial NPPs. The NRC retained responsibility for onsite activities.

The NRC Authorization Acts of 1980 (Pub.L. 96-295) and 1982-1983 (Pub.L. 97-415) directed the NRC to establish emergency preparedness as a criterion for licensing commercial NPPs. Specifically, the NRC Authorization Acts prohibit the NRC from issuing an operating license for an NPP unless it finds that "there exists a State, local, or utility[3] plan which provides reasonable assurance that public health and safety is not endangered by operation of the facility concerned."[4] The acts also provide for the NRC to consult FEMA in developing standards for evaluating plans/procedures and in making individual determinations that the plans/procedures provide reasonable assurance for protecting public health and safety.[5] The NRC revised its regulations in 10 CFR Part 50 to incorporate additional emergency preparedness requirements, including 16 Planning Standards for onsite and offsite emergency response plans/procedures.

In 1980, the NRC and FEMA jointly issued NUREG-0654/FEMA-REP-1 to provide onsite and offsite planning guidance to protect public health and safety in the event of an incident at an NPP. This document includes the 16 Planning Standards and associated Evaluation Criteria for assessing whether the licensee and the affected OROs have plans/procedures in place that provide a reasonable assurance that adequate protective measures can and will be taken.

FEMA regulations in 44 CFR Part 350 address the review and approval of ORO emergency plans/procedures for responding to radiological emergencies at commercial NPPs. These regulations also include the 16 Planning Standards and incorporate by reference the joint NRC-FEMA guidance document NUREG-0654/FEMA-REP-1.

In June 1996, FEMA initiated a Strategic Review of the REP Program in order to improve its efficiency and effectiveness.[6] FEMA worked with internal and external stakeholders nationwide and published five major recommendations in September 1998.[7] These recommendations were:

1. Streamline the REP Program;
2. Increase Federal Participation in REP Exercises;
3. Use State, Local, and Tribal Personnel as Exercise Evaluators;
4. Include Native American Tribal Nations in the REP Preparedness Process; and
5. Enhance the REP Training Program.

Each recommendation included initiatives for implementation.

[2] 42 USC 5131, as amended by the Robert T. Stafford Disaster Relief and Emergency Assistance Act, Public Law (Pub.L.)100-707, 102 Stat. 4689 (1988). This Act constitutes the statutory authority for most Federal disaster response activities, especially as they pertain to FEMA and FEMA programs.

[3] 44 CFR Part 352 allows for the submission of offsite emergency response plans/procedures by a licensee in those instances where OROs, either individually or together, decline or fail to prepare commercial NPP offsite radiological emergency preparedness plans/procedures that are sufficient to satisfy NRC licensing requirements or to participate adequately in preparation, demonstration, testing, exercise, or use of such plans/procedures.

[4] Pub.L. 97 415, section 5, 96 Stat. 2067, 2069 (1983).

[5] Pub.L. 96 295, section 109(b), 94 Stat. 80, 784 (1980).

[6] 61 FR 35733, Notice of the Federal Emergency Management Agency's Intent to Conduct a Strategic Review of Its Radiological Emergency Preparedness Activities, July 8, 1996.

[7] 63 FR 48222, Publication of Radiological Emergency Preparedness (REP) Program Strategic Review Draft Final Recommendations, September 9, 1998. This notice also summarized several short-term improvements implemented at that time.

2. Programmatic Changes

The lessons learned from September 11, 2001 and Hurricane Katrina compelled all Federal agencies – particularly those that have a mission to protect public health and safety – to examine their programs to ensure adequate preparation existed for catastrophic and unanticipated incidents. This section describes how the resulting programmatic changes impacted the REP Program.

a. Department of Homeland Security National Preparedness Initiatives

After September 11, 2001, Congress passed the Homeland Security Act of 2002 (Pub.L. 107-296, 116 Stat. 2135) to establish the Department of Homeland Security (DHS) to lead emergency prevention and preparedness efforts for terrorist acts and other catastrophic incidents. A Reorganization Plan submitted to the President pursuant to Section 1502 of the DHS Act of 2002 transferred FEMA to DHS. With this reorganization, FEMA actively directed its "all-hazards" disasters approach toward homeland security issues.

DHS' overriding mission is to lead a unified national effort to prepare for and respond to all hazards and disasters. To address this need for a unified and coordinated approach, Homeland Security Presidential Directive (HSPD)-5: *Management of Domestic Incidents* and Presidential Policy Directive (PPD)-8: *National Preparedness*[8] established national initiatives for a common approach to preparedness and response. These initiatives include:

- **National Incident Management System** – NIMS provides a systematic, proactive approach to guide all jurisdictional levels and the private sector to work seamlessly to prevent, protect against, respond to, recover from, and mitigate the effects of incidents, regardless of the cause, size, or complexity. Building upon ICS, NIMS provides the Nation's first responders and authorities with a common foundation for incident management for terrorist attacks, natural disasters, and other emergencies. NIMS complements the National Response Framework (NRF).
- **National Preparedness Goal** – "A secure and resilient nation with capabilities required across the whole community to prevent, protect against, mitigate, respond to, and recover from the threats and hazards that pose the greatest risk." The Goal also defines a series of national preparedness elements, called core capabilities, needed to achieve the Goal.
- **Core Capabilities** – are distinct critical elements necessary to achieve the specific mission areas of prevention, protection, mitigation, response, and recovery. Capabilities provide a common vocabulary describing the significant functions required to deal with threats and hazards that must be developed and executed across the whole community to ensure national preparedness.
- **National Preparedness System** – outlines an organized process for everyone in the whole community to move forward with their preparedness activities and achieve the National Preparedness Goal. The National Preparedness System has several parts, among them are the estimating, building, and sustaining of Core Capabilities and the use of the HSEEP methodology to validate a community's progress towards preparedness goals.
- **National Planning Frameworks** – The National Planning Frameworks, which are part of the National Preparedness System, set the strategy and doctrine for building, sustaining, and delivering the core capabilities identified in the National Preparedness Goal. They describe the coordinating structures and alignment of key roles and responsibilities for the whole community and are integrated to ensure interoperability across all mission areas. The frameworks address the roles of individuals, nonprofit entities and nongovernmental organizations (NGOs), the private sector, communities, critical infrastructure, governments, and the Nation as a whole. There is one Framework per mission area.
- **Comprehensive Preparedness Guide** – FEMA's Comprehensive Preparedness Guide (CPG) 101 provides general guidelines on developing emergency operations plans.[9] It promotes a common understanding of the fundamentals of planning and decision making to help emergency planners examine a hazard and produce integrated, coordinated, and synchronized plans.

[8] On March 30, 2011, PPD-8 on National Preparedness was signed. This directive replaces Homeland Security Presidential Directive (HSPD)-8 (National Preparedness), issued December 17, 2003, and HSPD-8 Annex I (National Planning), issued December 4, 2007, which are hereby rescinded, except for paragraph 44 of HSPD-8 Annex I. Individual plans developed under HSPD-8 and Annex I remain in effect until rescinded or otherwise replaced.

[9] FEMA, Comprehensive Preparedness Guide 101: Developing and Maintaining Emergency Operations Plans, Version 2.0, November 2010.

FEMA encourages OROs to use CPG 101 for all-hazards planning. CPG 101 is the first in a series of publications developed through the FEMA Protection and National Preparedness Directorate's (PNPD) CPG Initiative. Future CPGs will discuss planning considerations for a variety of emergency functions, hazards, and special preparedness programs.

On October 4, 2006, the President signed The Post-Katrina Emergency Management Reform Act (PKEMRA) into law, which reconfigured FEMA to include consolidated emergency management functions, including national preparedness functions. The REP Program was incorporated into the FEMA PNPD, which provides strategy, policy, and planning guidance to build prevention, protection, response, and recovery capabilities among all levels of government throughout the Nation. One new capability mandated by PKEMRA is the National Exercise Simulation Center (NESC), which provides a means to incorporate increased levels of Federal interagency participation into ongoing REP exercise activities.

b. Initiatives in the REP Program Manual

Revisions to the REP Program Manual address alignment and integration of the REP Program with two specific initiatives:

- **NIMS** – The REP Program Manual incorporates NIMS features, such as standard terminology and the ICS, to ensure consistency with the National Exercise Program. NIMS also provides a flexible management template that can be scaled appropriately to any incident, regardless of cause, size, location, or complexity.
- **HSEEP Methodology** –DHS uses HSEEP methodology for the development, conduct, and evaluation of emergency response exercises to test and evaluate preparedness plans/procedures and strategies at all levels of government. Integrating HSEEP methodology into the REP Program will achieve program efficiencies by: (1) ensuring REP Program compliance with elements of HSPD-5, PPD-8, and PKEMRA; (2) standardizing exercise design, conduct, evaluation, and improvement planning activities among all FEMA Regions and evaluation team members; (3) reducing scheduling conflicts by bringing the REP Program into the National Exercise Schedule; (4) reducing exercise fatigue by combining multiple requirements into fewer total exercises; and (5) providing a suite of standardized tools for scheduling, planning, information sharing, and evaluation/corrective action. As discussed in more detail in Part III of this Manual, HSEEP does not supersede any applicable legislation, regulations, or guidance for the REP Program.

c. REP Exercise Scenario and Security Incident Preparedness Enhancements

Following the events of September 11, 2001, the NRC reviewed the emergency preparedness basis for commercial NPPs to assess whether the program could adequately address hostile action contingencies (e.g., terrorist attacks), given the programmatic basis on accidental releases. The NRC determined that potential radiological exposure to the public during a hostile action-based (HAB) incident is no more severe than in other accident sequences considered in the radiological emergency preparedness basis. However, the NRC and FEMA recognized that HAB incidents could present unique challenges to emergency preparedness programs because they differ from the accident-initiated incidents for which licensees and OROs typically plan, train, and exercise.

In July 2005, the NRC issued Bulletin 200502, "Emergency Preparedness and Response Actions for Security-Based Events" to collect data on program enhancements undertaken by licensees in order to address potential hostile actions. In 2006, the NRC issued Regulatory Issue Summary 2006-12[10] as an acceptable implementation methodology for the emergency preparedness program enhancements discussed in Bulletin 200502. The NRC also recommended pursuing rulemaking for emergency preparedness program enhancements for several security incident-related and non-security incident-related topics. Additionally, the NRC's comprehensive review identified several other areas for potential emergency preparedness program improvement and areas requiring increased clarity based on technological advances, and lessons learned from drills, exercises, and actual incidents.

[10] RIS 2006-12, "Endorsement of Nuclear Energy Institute Guidance 'Enhancements to Emergency Preparedness Programs for Hostile Action,'" July 19, 2006. This document endorsed the Nuclear Energy Institute (NEI) White Paper titled "Enhancements to Emergency Preparedness Programs for Hostile Action," issued May 2005 (revised November 18, 2005).

In 2007, FEMA and the NRC established an Exercise Scenario Task Force to identify, coordinate, and promulgate appropriate changes to FEMA and NRC regulations, exercise participation, and guidance to make REP exercises more realistic and challenging, and less predictable. The Task Force identified proposed changes to the REP Program in three areas:

1. Reducing response organizations' exercise pre-conditioning by increasing the variability of exercise events;
2. Enhancing security response capabilities based on post-September 11 security initiatives by introducing HAB scenarios into the REP exercise cycle; and
3. Providing guidance for varying the amount and type of simulated radioactive releases during exercise play.

Parts II and III of this manual reflect changes resulting from these efforts.

d. Special Information Regarding Service Animals and Household Pets

This manual provides general guidelines for expanding ORO plans/procedures in response to regulatory changes[11] regarding service animals. Plans/procedures reflect how a jurisdiction will provide care to service animals, including the identification of resources it has or can readily obtain through existing mutual aid agreements.

The term "service animal," refers to any dog that has been individually trained to do work or perform tasks for the benefit of an individual with a disability. The rule states that other animals, whether wild or domestic, do not qualify as service animals. Dogs that are not trained to perform tasks that mitigate the effects of a disability, including dogs that are used purely for emotional support, are not service animals. The final rule also clarifies that individuals with mental disabilities who use service animals that are trained to perform a specific task are protected by the American Disabilities Act (ADA).

Guidance on Household Pets Under Development

Although provisions for household pets are not currently required, FEMA encourages OROs to plan for the reality that in an emergency, many evacuees will arrive at reception centers with their pets.

The rule permits the use of trained miniature horses as alternatives to dogs, subject to certain limitations. To allow flexibility in situations where using a horse would not be appropriate, the final rule does not include miniature horses in the definition of "service animal."[12] Service animals are permitted in all places that serve the public as long as the animal is not out of control. This access includes transportation with their owners/handlers during evacuations.

OROs can find planning guidance for evacuation and sheltering of household pets in CPG 101; however no specific guidance on the radiological monitoring and decontamination of household pets currently exists.

[11] Sections 403 and 502 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act, 42 U.S.C. 5170b, 42 U.S.C. 5192; the Pets Evacuation and Transportation Standards Act (PETS Act) of 2006, P.L. No. 109-308, § 4, 120 Stat. 1725 (2006).

[12] The Department of Justice published revised final regulations implementing the Americans with Disabilities Act (ADA) for title II (State and local government services) and title III (public accommodations and commercial facilities) on September 15, 2010, in the Federal Register. These requirements, or rules, clarify and refine issues that have arisen over the past 20 years and contain new, and updated, requirements, including the 2010 Standards for Accessible Design (2010 Standards).

E. EVALUATION OF RADIOLOGICAL EMERGENCY PREPAREDNESS

This manual provides clarifying guidance from FEMA. The planning guidance contained in Part II of this manual further explains the NUREG-0654/FEMA-REP-1 Planning Standards and associated Evaluation Criteria that apply to OROs. Certain Evaluation Criteria in NUREG-0654/FEMA-REP-1, including all of those in Planning Standard B, *Onsite Emergency Organization*, do not pertain to offsite planning and preparedness; however, this manual incorporates all of the Planning Standards and Evaluation Criteria to maintain consistency with NUREG-0654/FEMA-REP-1.

1. NRC-FEMA Memorandum of Understanding

FEMA and the NRC entered into a Memorandum of Understanding (MOU) (contained in Appendix A to 44 CFR Part 353) to detail their respective authorities and responsibilities for radiological emergency response planning and preparedness. The MOU outlines FEMA's responsibilities in evaluating offsite emergency preparedness and details the procedures under which the NRC requests, and FEMA provides, preparedness findings.

Under the MOU, FEMA may review radiological emergency planning and preparedness and provide its findings to the NRC under various circumstances:

- FEMA will review ORO plans/procedures when the Governor of a State submits them for formal review.
- FEMA will provide interim findings on the current state of preparedness based on its review of site-specific plans/procedures and, if appropriate, exercise performance. For example, the NRC may request an interim finding in connection with an application for an Early Site Permit under 10 CFR § 52.17(b)(2).
- If there is reason to believe that reasonable assurance may no longer exist at a particular site, FEMA may review offsite emergency preparedness on its own initiative, or at the request of the NRC, to develop a finding.
- FEMA may initiate a Disaster-Initiated Review (DIR) in the event of a disaster that may affect emergency preparedness and response in the vicinity of an NPP (e.g., a hurricane or earthquake that disrupts roads used for evacuation), to determine whether the disaster significantly degraded preparedness. FEMA will forward the results of such a review to the NRC for its consideration in making decisions on the restart or continued operation of the affected facility.

FEMA–NRC Steering Committee: Section IX of the MOU also describes the joint NRC-FEMA Steering Committee, which is the "focal point for coordination of emergency planning and preparedness" and will "assure coordination of plans and preparedness evaluation activities and revise, as necessary, acceptance criteria for licensee, State, and local radiological emergency planning and preparedness." Questions about the interpretation of the criteria used for evaluating offsite plans/procedures and preparedness may be referred to FEMA Headquarters and, when appropriate, to the FEMA/NRC Steering Committee to assure uniform interpretation.

2. Specific FEMA Review and Approval Procedures

This section provides an overview of how FEMA conducts its reviews of ORO preparedness under 44 CFR Part 350. These regulations define procedures for submitting plans/procedures for formal review and approval, as well as other requirements (e.g., public meeting and exercise) for establishing reasonable assurance of public health and safety. Responsibilities are defined at the FEMA Regional and Headquarters level for evaluating and approving ORO preparedness, including procedures for withdrawing approval if subsequent information indicates that preparedness is no longer adequate to demonstrate reasonable assurance.

Pursuant to FEMA policy and procedures, FEMA Regional Office personnel evaluate plans/procedures with assistance from RAC members. The RACs consist of representatives of Federal agencies with special authorities, missions, and expertise that have agreed to assist FEMA in providing technical assistance to OROs and in evaluating REP plans/procedures and exercises. FEMA Regional Offices review REP plans/procedures and forward their recommended findings to FEMA Headquarters for final determination by the Deputy Administrator of PNPD, or designee. FEMA Headquarters forwards its reviews of the adequacy of the REP plans/procedures and findings to the NRC for its use in making licensing decisions.

State submittal: The process for initial approval, outlined in 44 CFR § 350.7 through 350.14, begins when a State applies to the appropriate FEMA Regional Administrator for approval of its planning and preparedness at a particular commercial NPP. The State submittal covers both the State and appropriate local governments. In States with multiple commercial NPP sites, the State must submit separate plans/procedures for each site. FEMA approval of planning and preparedness is specific to the site. The Governor or designee signs a letter declaring that, in the opinion of the State, the plans/procedures are "adequate to protect the health and safety of its citizens...by providing reasonable assurance that State, local, and Tribal governments can and intend to effect appropriate protective measures offsite in the event of a radiological emergency." (44 CFR § 350.7(d))

With assistance from the RAC, the Regional Administrator makes a detailed review of the plans/procedures according to the Planning Standards and Evaluation Criteria outlined in 10 CFR § 50.47(b), 44 CFR § 350.5, and NUREG-0654/FEMA-REP-1 and assesses factors such as adequacy and maintenance of procedures, training, resources, staffing, and equipment. The Regional Administrator works with the State to resolve any inadequacies identified in this review.

Qualifying exercise: In addition to submitting plans/procedures for review, the State, together with all appropriate OROs, must demonstrate the ability to implement their plans/procedures by conducting at least one joint, full-participation exercise that includes participation by the licensee. After the exercise, the State must hold a public meeting in the vicinity of the NPP to review the plans/procedures and exercise. Based on a review of the plans/procedures, exercise, and public meeting, the Regional Administrator submits the plans/procedures and his or her evaluation to the Deputy Administrator of PNPD. The Regional Administrator forwards materials including an evaluation of each Planning Standard set out in 44 CFR § 350.5, the results of any REP exercise(s), a summary of any deficiencies identified during the exercise(s) or public meeting(s), recommendations made to the State for improvements, and commitments made by the State for effecting improvements.

Approval: The Deputy Administrator of PNPD reviews the plans/procedures submitted by the Regional Administrator, with assistance from the Federal Radiological Preparedness Coordinating Committee (FRPCC) and other FEMA offices. The Deputy Administrator of PNPD approves the plans/procedures if he or she determines they provide reasonable assurance and are therefore adequate, and that OROs are capable of implementing them. FEMA communicates approval or disapproval to the appropriate Governor, the NRC, the appropriate Regional Administrator, and publishes the decision in the *Federal Register*.

Withdrawal of approval: If, at any time, the Deputy Administrator of PNPD determines that the plans/procedures are no longer adequate or no longer capable of implementation, he or she advises the Governor of the affected State, the appropriate Regional Administrator, and the NRC. The Deputy Administrator of PNPD must spell out in detail the reasons for this determination. The State then has 120 days to either correct the Deficiencies noted or submit an acceptable plan for correcting them. If a plan for correcting Deficiencies is submitted, the Deputy Administrator of PNPD negotiates with the State regarding the schedule for implementing the corrective action plan. If the State does not correct the Deficiencies and does not submit an acceptable plan after 120 days, or if the State submits an acceptable plan but fails to correct the Deficiencies by the agreed-upon date, the Deputy Administrator of PNPD may withdraw FEMA approval of the plans/procedures and proceed to notify the appropriate Governor, the NRC, and the appropriate Regional Administrator.

3. Federal Delegation of Tasks

44 CFR Part 351 delineates the responsibilities of supporting Federal departments and agencies and assigns tasks for providing Federal assistance in radiological emergency planning and preparedness on the basis of each agency's mission, role, and expertise. The regulation establishes the FRPCC and the RACs and delineates their functions.

The FRPCC consists of FEMA, NRC, Environmental Protection Agency (EPA), Department of Health and Human Services (HHS), Department of Energy (DOE), Department of Transportation (DOT), Department of Defense (DOD), United States Department of Agriculture (USDA), Department of Commerce (DOC), and other Federal departments where appropriate. FRPCC functions include:

- Assist FEMA in providing policy direction for the REP Program and other Federal assistance to OROs in their radiological emergency planning and preparedness activities;
- Establish subcommittees to aid in carrying out its functions (e.g., research, training, emergency instrumentation, transportation, information, education, and Federal response);

- Assist FEMA in resolving issues related to granting final FEMA approval of State or Tribal plans/procedures; and
- Coordinate research and study efforts of its member agencies related to ORO radiological emergency preparedness to assure minimum duplication and maximum benefits to OROs.

The RACs convene in every FEMA Region. A FEMA Regional representative chairs the RAC. Other departments and agencies represented on the RACs include the NRC, EPA, HHS, DOE, DOT, USDA, DOC and other departments and agencies as appropriate. The RACs assist ORO officials in developing and reviewing their plans/procedures and observe exercises to evaluate the plans' adequacy.

Additional information on Federal agency roles and responsibilities in responding to radiological incidents appears in the Nuclear/Radiological Incident Annex of the NRF.[13]

4. Planning And Preparedness Assessment Strategy

Significant plan changes: After FEMA's initial determination of reasonable assurance, it continues to monitor preparedness at each site. FEMA must receive any significant change to previously approved plans/procedures for review and approval. A significant change is one involving the evaluation and assessment of a Planning Standard or a matter which, if presented with the plan, would require consideration by the Deputy Administrator of PNPD (or designee) in order to decide that ORO plans/procedures and preparedness are 1) adequate to protect the health and safety of the public living in vicinity of the commercial NPP by providing reasonable assurance that OROs can take appropriate protective measures in the event of a radiological emergency; and 2) capable of being implemented. However, the Regional Administrator may determine that certain procedures, such as holding a public meeting or a complete exercise, are unnecessary when reviewing these changes. In this case, the existing approval remains in effect during review of the change. OROs review plans annually to ensure that all information is current, regardless of whether any changes require approval.

Periodic requirements: In addition to approving significant changes, FEMA employs an assessment strategy to ensure maintenance of reasonable assurance. This strategy includes biennial evaluation of specified exercises and drills, SAVs, the annual plan review, and an annual letter from the State to FEMA certifying the completion of other elements required by NUREG-0654/FEMA-REP-1 such as training and the updating of public emergency information.

Ongoing assessment: FEMA supplements these "snapshot" assessments with the evaluation and observation of ongoing activities including full-scale, functional, and tabletop exercises; other types of drills; seminars; training activities; interviews; and responses to actual events. In addition, FEMA employs a dedicated Site Specialist for each NPP whose responsibilities include maintaining an ongoing assessment record that reflects the status of offsite preparedness and training. This approach allows FEMA to maintain a more up-to-the-minute assessment of reasonable assurance throughout the year and provide increased integration with other Federal, State, local, and Tribal government preparedness activities.

The HSEEP methodology supports the use of a variety of activities to assess response capabilities. HSEEP also facilitates activity planning and scheduling coordination. Part III of this Manual discusses the HSEEP methodology in detail as it applies to the REP Program.

[13] June 2008. See http://www.fema.gov/pdf/emergency/nrf/nrp_nuclearradiologicalincidentannex.pdf

F. TECHNICAL BASIS FOR THE REP PROGRAM

This section presents a brief overview of the science, pathways of exposure, and biological effects of radiation, as well as the protective actions used to minimize exposure. This section serves only as a basic introduction to the topics of radiation and nuclear science.

1. Nature of the Hazard

Radiation is any form of energy that travels through space or matter. As the radiation travels through matter, it deposits its energy in that matter. The radiation emitted by many radioactive isotopes contains enough energy to change the physical state of the material through which it passes. This causes the atoms of that material to become electrically charged, or ionized. The "exposure," expressed in the unit Roentgen (R)[14], is the amount of ionization produced by x- or gamma rays as they travel through air.

If the radiation deposits its energy in human tissue, the resulting ionized atoms may damage human cells. The quantity of radiation or energy absorbed is the "dose" and is expressed in Roentgen-absorbed-dose (rad). For a person, the dose is usually given in units of Roentgen-equivalent-man (rem) and includes the biological effect of the radiation received (rem = rad x radiation weighting factor[15]).

If an accidental airborne release of radioactive material occurs from an NPP, three main pathways exist for a person to receive a radiation dose during the release period:

- External exposure to the released plume;
- External exposure from any radioactive material deposited on the ground from the plume; and
- Inhalation of radioactive material from the plume.

After the release stops and the plume dissipates, external exposure from deposited materials and ingestion of materials through the food chain represent the main pathways for a person to receive a radiation dose. Another possible source of exposure would be from inhalation of materials if the ground deposition is re-suspended into the air.

[14] Some countries use the Standard International Units of Coulomb per kilogram (C/kg) instead of R (1 C/kg = 3876 R); Gray (Gy) instead of rad (1 Gray = 100 rad); and Sievert (Sv) instead of rem (1 Sv = 100 rem).

[15] Radiation weighting factor is the factor by which the absorbed dose (rad) must be multiplied to obtain a quantity that expresses, on a common scale for all ionizing radiation, the biological damage (rem Sievert) to the exposed tissue. It is used because some types of radiation, such as alpha particles, are more biologically damaging to live tissue than other types of radiation when the absorbed dose from both is equal.

Exposure vs. Contamination

It is important to distinguish between direct exposure to radiation and exposure through radiological contamination. A person exposed to a medical X-ray receives direct radiation, but the body is not radioactively contaminated. Radioactive contamination occurs when radioactive particles are deposited on a person's skin and can be absorbed through the skin or by inhalation or ingestion.

The following three basic types of ionizing radiation could pose a radiological hazard during an unexpected release at an NPP:

- **Alpha radiation** is a positively charged particle emitted from the unstable nucleus of a radioactive isotope when the neutron-to-proton ratio in the nucleus is too low. Alpha particles are highly ionizing, but the particles travel short distances in air (4 centimeters) before being absorbed. Alpha particles have a very low ability to penetrate objects; a few sheets of paper or the outer layers of skin can stop them. The external hazard from alpha particles is minimal, while the internal hazard, when they are inhaled or absorbed, may be significant.
- **Beta radiation** is a negatively charged particle emitted from the unstable nucleus of a beta-unstable radioactive atom. Beta particles usually travel greater distances in air than alpha particles (about 2 meters) before being absorbed. Beta particles are more penetrating than alpha particles – they can pass through an inch of water or human tissue – but a thin sheet of aluminum can stop them. Depending on the radionuclide, beta particles may pose an external radiation hazard, such as skin burns.
- **Gamma radiation** is electromagnetic radiation emitted from the nucleus of a radionuclide. It travels a greater distance in air than alpha or beta particles before being absorbed. Gamma-ray radiation is similar to X-rays; dense shielding material, such as lead, is needed to absorb it. Gamma-ray radiation is the most common external radiation hazard encountered in a radiation incident. Because of their high penetrating power, high-energy gamma rays can irradiate the entire human body almost uniformly, and they pose a serious external and internal hazard.

Excessive exposure of the whole body (or large part) to ionizing radiation causes the complex of symptoms characterizing the disease known as radiation injury. The earliest of these symptoms are nausea, fatigue, vomiting, and diarrhea, which may be followed by loss of hair (epilation), hemorrhage, inflammation of the mouth and throat, and general loss of energy. In severe cases, where the radiation exposure has been relatively large, death may occur within 2 to 4 weeks. Those who survive 6 weeks after the receipt of a single large dose of radiation may generally be expected to recover.

These considerations form the basis of emergency planning, along with actions implemented to protect the health and safety of the public after a radiological release.

2. Protective Actions to Reduce Exposure to Radiation

An ORO conducts protective actions in response to an incident or potential incident to prevent or minimize the projected radiation dose, when the benefits of the action are sufficient to offset any undesirable consequences. Each action seeks to implement one of the following radiation protection principles: decrease *time* of exposure, increase *distance* from the source, provide *shielding* from the plume, or limit *ingestion* of contaminated foodstuffs.

Exhibit I-1: Probable Early Effects of Acute Radiation

Whole Body Doses	
Acute Doses	**Probable Effect**
0 to 25 R	No obvious injury
25 to 50 R	Possible blood changes, but no serious injury
50 to 100 R	Blood cell changes, some injury, no disability
100 to 200 R	Injury, possible disability
200 to 400 R	Injury and disability certain, death possible
400 R	Fatal to 50%
600 R or more	Fatal

The protective actions that offsite authorities may implement include the following:

- Evacuating from areas of projected plume passage;
- Sheltering in homes or other structures;
- Controlling access to areas near the NPP;
- Administering potassium iodide (KI) to emergency workers (EWs), populations who cannot be evacuated, and, where included in the emergency plans/procedures, the general public;
- Controlling surface contamination;
- Placing livestock on stored feed and protected water;
- Quarantining or excluding foodstuffs from consumption; and
- Relocating populations from areas where radiation levels exceed the relocation protective action guide (PAG).

The appropriate protective action will depend on a number of factors, including projected beginning of the radiological release, projected duration of the release, composition and direction of the release, weather conditions, and time of day (e.g., day versus night). All protective actions have the common goal of preventing or minimizing exposure of the public to radiation.

3. Protective Action Guides

In an unexpected release of radioactive material, the licensee calculates a projected dose to estimate the potential level of exposure an individual would receive if no protective actions were taken. This future dose is determined for a specific period of time, using estimated or measured initial concentrations of radionuclides or exposure rates. A PAG is a number representing the projected dose to individuals that triggers the need for protective actions from a release of radioactive material. Decision-makers compare estimates of projected dose with the appropriate PAG to determine what actions to take.

A PAG does not imply an acceptable level of exposure risk; it is used only to minimize the risk from an incident that is occurring or has already occurred. The following criteria were used to establish PAGs:

- Avoid acute health effects;

- Keep the risk of delayed health effects within upper bounds that adequately protect public health and are reasonably achievable; and
- Ensure that the health risk from protective actions does not exceed the health risk from the dose that would be avoided.

a. General Public

Separate PAGs have been developed for the early (plume) and the intermediate (ingestion and relocation) phases of an incident. EPA recommends early (plume) phase PAGs of 1 to 5 rem for evacuation (if possible) or sheltering (if evacuation is not possible); evacuation is usually initiated at 1 rem. EPA also established PAGs for administering KI based on projected doses to thyroid. These PAGs appear in the EPA guidance manual, *Manual of Protective Action Guides and Protective Actions for Nuclear Incidents*, EPA-400-R-92-001 (May 1992), cited herein as "EPA-400-R-92-001." The Food and Drug Administration (FDA) also established guidance for the use of KI in its Federal Register notice *Guidance on Use of Potassium Iodide as a Thyroid Blocking Agent in Radiation Emergencies*, December 11, 2001.

PAGs provide a threshold dose limit to assist decision-makers in determining whether protective actions need to be taken for food or used during the intermediate phase. HHS and the FDA developed ingestion PAGs of 0.5 rem projected dose limit for the whole body or a 5 rem limit to the most exposed organ or tissue.[16] If one of these thresholds is met, responsible officials take protective actions to prevent or reduce the concentration of radioactivity in food or animal feed or isolate any food containing radioactivity to prevent its introduction into commerce.

PAGs for the General Public

- Evacuation/sheltering: 1-5 rem
- Ingestion: 0.5 rem projected whole body or 5 rem to most exposed part
- Relocation:2 rem whole body in first year

EPA also established an intermediate-phase relocation PAG[17] of 2 rem whole body exposure in the first year. The long-term objectives are to keep doses at or below 0.5 rem for each subsequent year after the release, and the total dose at or below 5 rem over 50 years. The relocation PAG addresses direct exposure to deposited radioactive materials and inhalation of re-suspended radioactive materials that were initially deposited on the ground or other surfaces.

b. Emergency Workers

In addition to the PAGs, EPA established separate guidance on dose limits for emergency workers, as provided in EPA-400-R-92-001. The dose limits for emergency workers performing emergency services are different from those for the general population, because they take into account all doses received during an emergency. The EPA-400 guides for emergency workers are shown in the box below.

PAGs for Emergency Workers

- A limit of 5 rem for any emergency activity.
- A limit of 10 rem for protecting valuable property (when a lower dose is not practicable).
- A limit of 25 rem for life-saving activities or protection of large populations (where a lower dose is not practicable).
- A dose greater than 25 rem for life-saving activities or protection of large populations when an emergency worker volunteers for the mission and is fully aware of the risks involved.

Radiological emergency response plans/procedures generally include the EPA limits. However, an organization may decide to adopt more restrictive administrative limits as a conservative measure or in special cases.

[16] Guidance on Accidental Radioactive Contamination of Human Food and Animal Feeds, Recommendations for state and Local Agencies, 63 Fed. Reg. 43402 (August 13, 1998).

[17] EPA-400-R-92-001, *Manual of Protective Action Guides and Protective Actions for Nuclear Incidents*, May 1992.

4. Emergency Planning Zones

The Emergency Planning Zone (EPZ) is the area surrounding an NPP for which plans/procedures exist to ensure that prompt and effective actions occur to protect the health and safety of the public in case of an incident at the NPP. FEMA recognizes two types of EPZs for planning purposes: the plume exposure pathway EPZ and the ingestion exposure pathway EPZ. Exhibit I-2 summarizes the characteristics of these two types of EPZs. Each EPZ is a roughly circular area, with the NPP at the center.

The EPZ sizes represent a technical judgment based on the type and quantity of hazardous materials present (source term) and the potential risks where detailed planning is needed to ensure adequate response to an emergency. An EPZ may include more than one State. "Split" jurisdictions (i.e., part of the jurisdiction is included in the EPZ and part is not) also exist. In these cases, EPZ boundaries are determined based on consultation with all parties involved, including OROs, FEMA, and the NRC. In some cases, the entire jurisdiction is included in the EPZ.

Exhibit I-2: EPZ Characteristics

	Plume Exposure Pathway	Ingestion Exposure Pathway
Exposure Sources	• Whole-body external exposure to gamma radiation from the passing plume and from deposited material • Thyroid exposure through inhalation from the passing plume • Committed effective dose equivalent exposure to other critical organs through inhalation	• Ingestion of contaminated water or foods, such as milk, fresh vegetables, and aquatic foodstuffs, may result in increased risk of radiation-induced cancer to the thyroid, bone marrow, and other organs
Size	Approximately 10-mile radius	Approximately 50-mile radius

The size of the plume exposure pathway EPZ, about 10 miles in radius, is based on the following considerations from NUREG-0654/FEMA-REP-1:

- Projected doses from traditional design-basis accidents/incidents would not exceed the PAG levels outside the zone;
- Projected doses from most core damage sequences would not exceed PAG levels outside the zone;
- For the worst-case core damage sequences, immediate life-threatening doses would generally not occur outside the zone; and
- Detailed planning within approximately 10 miles would provide a substantial base for expansion of response efforts to a larger area, if necessary.

The size of the ingestion exposure pathway EPZ, about 50 miles in radius, including the 10-mile radius plume exposure pathway EPZ, is based on the following considerations:

- The downwind range within which contamination may potentially exceed the PAGs is limited to about 50 miles from an NPP because of wind shifts during the release and travel periods;
- Atmospheric iodine (i.e., iodine suspended in the atmosphere for long periods) may be converted to chemical forms that do not readily enter the ingestion exposure pathway; and
- Much of the particulate material in a radioactive plume would have been deposited on the ground within about 50 miles from the NPP.

The likelihood of exceeding ingestion exposure pathway PAG levels at 50 miles is comparable to the likelihood of exceeding plume exposure pathway PAG levels at 10 miles.

5. Radiological Incident Phases

An incident involving a radiological release contains three general phases:

The early phase (also referred to as the plume or emergency phase) is the period at the beginning of a nuclear incident requiring immediate decisions for effective use of protective actions and must therefore usually employ the status of the NPP and the prognosis for worsening conditions as their primary basis. When available, decision makers may use predictions of radiological conditions in the environment based on the condition of the source or actual environmental measurements. Precautionary actions may precede protective actions based on the PAGs. This phase lasts hours to several days and ends when the radioactive release ends.

The intermediate phase is the period beginning after the utility verifies the termination of the release. Decisions on additional protective actions may use reliable environmental measurements as a basis. This phase extends until the termination of these additional protective actions. This phase may overlap the late phase and may last from weeks to many months. The intermediate phase encompasses REP activities associated with both ingestion and relocation.

The late phase is the period beginning when recovery action designed to reduce radiation levels in the environment to acceptable levels for unrestricted use are commenced, and ending upon completion of all recovery actions. This period may extend from months to years. REP activities associated with return and recovery occur during the late phase.

PART II: REP Program Planning Guidance

A. INTRODUCTION

1. Purpose and Scope

This part of the REP Program Manual is the primary source of guidance pertaining to radiological emergency response planning. This guidance is intended for use by OROs for developing, reviewing, and revising radiological emergency response plans/procedures in support of the licensing and maintenance of a license for commercial NPPs. It is also intended for use by FEMA staff members responsible for evaluating plans/procedures and by other Federal staff who assist FEMA as members of the RACs.

FEMA has provided guidance to interpret, clarify, and apply the Planning Standards and Evaluation Criteria through this manual, FEMA policy, and the FEMA-REP series documents. This part of the REP Program Manual consolidates all previously issued and current FEMA REP Program planning guidance developed by FEMA and other Federal departments and agencies. However, it does not include all the detailed and technical information on Planning Standards contained in the documents of the FEMA-REP series. For a list of the FEMA-REP series guidance documents and further detailed technical guidance, see Appendix C.

2. Contents and Organization

In addition to this introduction, this Part has four major Subparts:

Subpart B, Planning Standards, is a one-page listing of the 16 Planning Standards from 44 CFR Part 350, 10 CFR § 50.47, and NUREG-0654/FEMA-REP-1.

Subpart C, Planning Standards-Core Capability Crosswalk, is an analysis of the relationship between the core capabilities from the *National Preparedness Goal* and *National Planning Frameworks* and the Planning Standards from NUREG-0654/FEMA-REP-1. This crosswalk was created to provide context for the Planning Standards within contemporary emergency preparedness guidance.

Subpart D, Planning Guidance, lists the Planning Standards and Evaluation Criteria per NUREG-0654/FEMA-REP-1 and official revisions as footnoted. Subpart C also provides interpretation and application of the guidance, including the following:

- A listing of Evaluation Criteria related to each Planning Standard;
- An explanation of each Evaluation Criterion based on current guidance; and
- Checkmarks indicating to which plans/procedures (i.e., licensee, State, or local) each NUREG-0654/FEMA-REP-1 Evaluation Criterion is applicable.

The guidance in this manual applies only to *offsite* response organizations.

NOTE: While the NRC is responsible for Evaluation Criteria specific to the activities of nuclear utility licensees (e.g., B.1), these criteria have been included in the REP Program Manual to maintain continuity with the Planning Standards as set forth in 44 CFR Part 350, 10 CFR § 50.47, and NUREG-0654/FEMA-REP-1. Although there is no requirement for *OROs* to demonstrate these activities, it is important that they understand the *onsite* organization's structure and responsibility. Although many Evaluation Criteria are applicable to the licensee as well as OROs, the explanation provided by FEMA in this guidance is intended only for use by and applies only to OROs.

B. PLANNING STANDARDS

Planning Standard A – Assignment of Responsibility (Organization Control)

Planning Standard B – Onsite Emergency Organization

Planning Standard C – Emergency Response Support and Resources

Planning Standard D – Emergency Classification System

Planning Standard E – Notification Methods and Procedures

Planning Standard F – Emergency Communications

Planning Standard G – Public Education and Information

Planning Standard H – Emergency Facilities and Equipment

Planning Standard I – Accident Assessment

Planning Standard J – Protective Response

Planning Standard K – Radiological Exposure Control

Planning Standard L – Medical and Public Health Support

Planning Standard M – Recovery and Reentry Planning and Post-Accident Operations

Planning Standard N – Exercises and Drills

Planning Standard O – Radiological Emergency Response Training

Planning Standard P – Responsibility for the Planning Effort: Development, Periodic Review, and Distribution of Emergency Plans

C. PLANNING STANDARDS-CORE CAPABILITY CROSSWALK

Exhibit II-1: NUREG-0654/FEMA-REP-1 Planning Standards-Core Capabilities Crosswalk

		NUREG-0654/FEMA-REP-1, Rev. 1 Planning Standard															
	Core Capabilities by Mission Area	Planning Standard A	Planning Standard B	Planning Standard C	Planning Standard D	Planning Standard E	Planning Standard F	Planning Standard G	Planning Standard H	Planning Standard I	Planning Standard J	Planning Standard K	Planning Standard L	Planning Standard M	Planning Standard N	Planning Standard O	Planning Standard P
Common	Planning	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Common	Public Information and Warning	X	X			X	X	X			X			X			
Common	Operational Coordination	X	X	X	X	X	X	X	X	X	X	X	X	X			
Prevention	Forensics and Attribution																
Prevention	Intelligence and Information Sharing																
Prevention	Interdiction and Disruption																
Prevention	Screening, Search, and Detection								X	X	X						
Protection	Access Control and Identity Verification										X						
Protection	Cybersecurity																
Protection	Intelligence and Information Sharing																
Protection	Interdiction and Disruption																
Protection	Physical Protective Measures																
Protection	Risk Management for Protection Programs and Activities																
Protection	Screening, Search, and Detection								X	X	X						
Protection	Supply Chain Integrity																

Exhibit II-1: NUREG-0654/FEMA-REP-1 Planning Standards-Core Capabilities Crosswalk

	Core Capabilities by Mission Area	NUREG-0654/FEMA-REP-1, Rev. 1 Planning Standard															
		Planning Standard A	Planning Standard B	Planning Standard C	Planning Standard D	Planning Standard E	Planning Standard F	Planning Standard G	Planning Standard H	Planning Standard I	Planning Standard J	Planning Standard K	Planning Standard L	Planning Standard M	Planning Standard N	Planning Standard O	Planning Standard P
Mitigation	Community Resilience							X							X	X	X
Mitigation	Long-Term Vulnerability Reduction							X							X	X	
Mitigation	Risk and Disaster Resilience Assessment				X			X							X	X	
Mitigation	Threat and Hazard Identification																X
Response	Critical Transportation										X						
Response	Environmental Response/Health and Safety								X	X	X	X	X	X			
Response	Fatality Management Services																
Response	Infrastructure Systems										X						
Response	Mass Care Services										X						
Response	Mass Search and Rescue Operations																
Response	On-Scene Security and Protection										X						
Response	Operational Communications				X	X	X		X	X	X			X			
Response	Public and Private Services and Resources			X					X	X		X	X	X			
Response	Public Health and Medical Services										X	X	X				
Response	Situational Assessment				X	X				X	X	X		X			
Recover	Economic Recovery													X			
Recover	Health and Social Services													X			
Recover	Housing													X			
Recover	Infrastructure Systems													X			
Recover	Natural and Cultural Resources													X			

D. PLANNING GUIDANCE

1. Planning Standard A – Assignment of Responsibility (Organization Control)

Primary responsibilities for emergency response by the nuclear facility licensee and by State and local organizations within the Emergency Planning Zones have been assigned, the emergency responsibilities of the various supporting organizations have been specifically established, and each principal response organization has staff to respond and to augment its initial response on a continuous basis.

NUREG CRITERION A.1.a

Each plan shall identify the State, local, Federal, and private sector organizations (including utilities), that are intended to be part of the overall response organization for Emergency Planning Zones (See [NUREG-0654/FEMA-REP-1] Appendix 5).

Applicability and Cross-Reference to Plans: Licensee X State X Local X

TO MEET THE INTENT OF CRITERION A.1.a, ORO PLANS/PROCEDURES SHALL:

- ✓ Describe all Federal, State, local, Tribal, and private-sector organizations comprising the overall ORO. Tribal governments submit their own plans/procedures or may choose to be included as part of the State plans/procedures within which the Tribal land falls.
- ✓ Identify the principal response organizations.

EXPLANATION

Principal OROs: The plans/procedures document all Federal, State, local, Tribal, and private-sector organizations that comprise the overall response organization and the responsibilities each assumes. The plans/procedures identify *principal* OROs (e.g., emergency management, fire/HAZMAT, law enforcement) and nuclear facilities (the licensees) having *lead* roles in emergency planning, preparedness, and response.

Support OROs: The plans/procedures also identify all other organizations having a supporting role to the principal or lead organization(s) in emergency planning, preparedness, and response. This includes any Federal departments and agencies (e.g., FEMA, the NRC, Federal Bureau of Investigation [FBI]) or private-sector or volunteer organizations (e.g., American Red Cross, Radio Amateur Civil Emergency Services) that have response or support roles.

NIMS: HSPD-5 requires Federal departments and agencies to make the adoption of NIMS by OROs a condition for Federal preparedness assistance, through grants, contracts, and other activities. HSPD-5 and PKEMRA do not apply to private sector entities, such as NPP licensees. Licensees are encouraged, but not required, to adopt NIMS. However, offsite response concepts (based on ORO plans/procedures) should be coordinated with licensee plans/procedures to ensure effective response and communications between the licensee and OROs. NRC regulations in 10 CFR § 50.47(b)(3) & (b)(6) require licensees to ensure that their programs integrate with those of the OROs.

Although HSPD-5 does not require the adoption of NIMS for those OROs who do not seek Federal preparedness assistance, the integration of NIMS/ICS into ORO emergency plans/procedures for NPPs will provide greater consistency across response jurisdictions and facilitate integration of response elements during an incident that affects a NPP (e.g., HAB incident or catastrophic natural disaster). During such incidents, the OROs would establish Incident Command to facilitate the coordination and subsequent response operations between multi-jurisdictional organizations (i.e., both onsite and offsite organizations).

REFERENCES

- *National Incident Management System*, December 2008.
- *National Response Framework*, second edition, May 2013.
- *National Response Framework, Nuclear/Radiological Incident Annex*, June 2008.
- *Comprehensive Preparedness Guide 101: Developing and Maintaining State, Territorial, Tribal, and Local Government Emergency Plans*, Version 2, November 2010.

NUREG CRITERION A.1.b

Each organization and suborganization having an operational role shall specify its concept of operations and its relationship to the total effort.

Applicability and Cross-Reference to Plans: Licensee X State X Local X

TO MEET THE INTENT OF CRITERION A.1.b, ORO PLANS/PROCEDURES SHALL:

- ✓ Specify the organization's role in an emergency.
- ✓ Specify how the organization will carry out its role in an emergency.

EXPLANATION

The plans/procedures describe exactly what the organization or sub-organization19[18] plans to do in a radiological emergency, how this will be accomplished, and by whom. For those OROs that have adopted NIMS, the concept of operations is consistent with the core set of doctrines, concepts, principles, terminology and organizational processes of NIMS. The description of an organization's operation also includes a discussion of how the organization contributes to the overall emergency response (e.g., how a local ORO's plans/procedures relate to the State's plans/procedures).

REFERENCES

- *National Incident Management System*, December 2008.
- *National Response Framework*, second edition, May 2013.
- *National Response Framework, Nuclear/Radiological Incident Annex*, June 2008.
- *Comprehensive Preparedness Guide 101: Developing and Maintaining State, Territorial, Tribal, and Local Government Emergency Plans*, Version 2, November 2010.

NUREG CRITERION A.1.c

Each plan shall illustrate these interrelationships in a block diagram.

Applicability and Cross-Reference to Plans: Licensee X State X Local X

TO MEET THE INTENT OF CRITERION A.1.c, ORO PLANS/PROCEDURES SHALL:

- ✓ Include an illustration of each organization and its relationship to the total emergency response effort.[19]

[18] A sub-organization is defined as any organization (e.g., agency, department, office, or local jurisdiction) having a supporting role to the principal or lead organization(s) in emergency planning and preparedness.

[19] For a sample Incident Command System organization chart, see ICS Form 207, Organizational Chart. http://training.fema.gov/EMIWeb/IS/ICSResource/ICSResCntr_Forms.htm

EXPLANATION

The block diagram indicates the functional area assignments of each response organization. For those OROs that have adopted NIMS, an incident command structure has five major functional areas: command, operations, planning, logistics, and finance/administration.

REFERENCES

- *National Incident Management System*, December 2008.
- *National Response Framework*, second edition, May 2013.
- *National Response Framework, Nuclear/Radiological Incident Annex*, June 2008.
- *Comprehensive Preparedness Guide 101: Developing and Maintaining State, Territorial, Tribal, and Local Government Emergency Plans*, Version 2, November 2010.

NUREG CRITERION A.1.d

Each organization shall identify a specific individual by title who shall be in charge of the emergency response.

Applicability and Cross-Reference to Plans: Licensee X State X Local X

TO MEET THE INTENT OF CRITERION A.1.d, ORO PLANS/PROCEDURES SHALL:

- ✓ Identify a specific individual, by title/position, who is in charge of the emergency response.
- ✓ Specify who, by title/position, coordinates response activities under the authority of the person in charge.

EXPLANATION

The plans/procedures identify the person in charge by title/position (i.e., who has the authority to direct emergency response activities). The plans/procedures also include the chain of command for this authority and how these individuals interact with incident command.

At the State level, the person in charge is typically the Governor; however, the Governor's designee (e.g., the State emergency management director) usually implements the emergency response. At the local level, the person in charge of emergency operations is typically the highest elected official (e.g., mayor or chairman of the county board of supervisors); however, this person usually delegates the operational authority to a director or coordinator of emergency management.

REFERENCES

- *National Incident Management System*, December 2008.
- *National Response Framework*, second edition, May 2013.
- *National Response Framework, Nuclear/Radiological Incident Annex*, June 2008.
- *Comprehensive Preparedness Guide 101: Developing and Maintaining State, Territorial, Tribal, and Local Government Emergency Plans*, Version 2, November 2010.

NUREG CRITERION A.1.e

Each organization shall provide for 24-hour per day emergency response, including 24-hour per day manning of communications links.

Applicability and Cross-Reference to Plans: Licensee X State X Local X

TO MEET THE INTENT OF CRITERION A.1.e, ORO PLANS/PROCEDURES SHALL:

- ✓ Specify who, by title/position, is responsible for managing the communications center.
- ✓ Describe the procedures to provide for 24-hour emergency response.
- ✓ Specify where the 24-hour communications center is located.
- ✓ Refer to a personnel roster for maintaining 24-hour communication.
- ✓ Specify primary and backup means of notification.

EXPLANATION

The intent of this criterion is to ensure that organizations are capable of responding to an emergency and maintaining communications capabilities on a 24-hour basis. Organizations document and describe their procedures for activating their emergency response organization at any time and specify the individual, by title/position, responsible for maintaining 24hour communications.

In the plans/procedures, organizations specify the location of the communications center (e.g., warning point or 911 center), describe the primary and backup means of notification, and identify the individual(s), by title/position, or organization(s) responsible for this emergency response function.

Backup means of notification refers to whatever secondary communication systems are in place to execute notification if the primary communication link fails. These could include, but are not limited to, commercial telephones, fax, and emergency radio frequencies.

REFERENCES

- *National Incident Management System*, December 2008.
- *Comprehensive Preparedness Guide 101: Developing and Maintaining State, Territorial, Tribal, and Local Government Emergency Plans*, Version 2, November 2010.

NUREG CRITERION A.2.a

Each organization shall specify the functions and responsibilities for major elements and key individuals by title, of emergency response, including the following: Command and Control, Alerting and Notification, Communications, Public Information, Accident Assessment, Public Health and Sanitation, Social Services, Fire and Rescue, Traffic Control, Emergency Medical Services, Law Enforcement, Transportation, Protective Response (including authority to request Federal assistance and to initiate other protective actions), and Radiological Exposure Control. The description of these functions shall include a clear and concise summary such as a table of primary and support responsibilities using the agency as one axis, and the function as the other. (See Section B for licensee.)[20]

Applicability and Cross-Reference to Plans: Licensee __ State X Local X

[20] NUREG-0654/FEMA-REP-1, Revision 1, Section II. Planning Standards and Evaluation Criteria, Part B – Onsite Emergency Organization, October 1980.

TO MEET THE INTENT OF CRITERION A.2.a, ORO PLANS/PROCEDURES SHALL:

- ✓ Identify key individuals, by title/position, who have emergency response roles.
- ✓ Describe the responsibilities by functional areas
- ✓ Include a matrix of these responsibilities by functional area that identifies organizations responsible for primary and support roles. A sample matrix/table is shown in Exhibit II-1.

EXPLANATION

Both primary and support organizations describe their responsibilities and functions for major elements. For those OROs that have adopted NIMS/ICS, these descriptions identify who will carry out the five ICS functions.

REFERENCES

- *National Incident Management System*, December 2008.
- *National Response Framework*, second edition, May 2013.
- *National Response Framework, Nuclear/Radiological Incident Annex*, June 2008.
- *Comprehensive Preparedness Guide 101: Developing and Maintaining State, Territorial, Tribal, and Local Government Emergency Plans*, Version 2, November 2010.

Exhibit II-2: Sample Functional Responsibilities Matrix/Table

Incident Command System Functional Area and Function		Agency													
		County Commissioners	Dispatch	Health District	County Emergency Management	Fire Services	City Police	County Sheriff's Office	County Public Works	School Districts	Red Cross	EAS Radio	Communication Coordinator	City Officials	Public Information Officer
Command & Control	Command & Control	P			C			A						A	
	Alerting & Notification	P			S			S	S			S			
	Communications		S		A								P		
	Public Information				C							S			P
Operations	Fire & Rescue					P	S	S							
	Traffic Control					S	S	P	A						
	Emergency Medical Service					P									
	Law Enforcement						A	P							
Logistics	Public Health			P							S				
	Sanitation			P					A						
	Social Services				C						P			A	
	Transportation				C					P					
	Mass Care Facility				C					S	P				
	Evacuation	P		S	C					S	S	S		S	S
Planning	Radiological Exposure Control	S		P	C	S	S	S	S						
	Public Education	S		S	C	S	S	S	S	S	S				P
	Prevention & Preparedness	S		S	P	S	S	S	S	S	S				S
	Protective Response Training	S	S	S	P	S	S	S	S	S	S	S	S	S	S

KEY: P = Primary Agency/Organization C = Coordinating Agency
S = Supporting Agency A = Alternate Agency

NUREG CRITERION A.2.b

Each plan shall contain (by reference to specific acts, codes, or statutes) the legal basis for such authorities.

Applicability and Cross-Reference to Plans: Licensee __ State X Local X

TO MEET THE INTENT OF CRITERION A.2.b, ORO PLANS/PROCEDURES SHALL:

- ✓ Identify the legal authority to assign lead responsibility for emergency preparedness to a particular State agency.
- ✓ Indicate who (e.g., the Governor) may declare a "state of emergency" (or "state of disaster emergency") and what special powers may ensue.
- ✓ Identify the legal authority to delegate responsibility and authority for preparedness and response at the local level.
- ✓ Identify any limitations on the authority of Letter of Agreement (LOA) signatories that are relevant to State, local, or tribal statues and not policy.

EXPLANATION

The plans/procedures give the citation from the relevant State, local, or Tribal statute(s).

REFERENCES

- *National Incident Management System*, December 2008.
- *National Response Framework*, second edition, May 2013.
- *National Response Framework, Nuclear/Radiological Incident Annex*, June 2008.
- *Comprehensive Preparedness Guide 101: Developing and Maintaining State, Territorial, Tribal, and Local Government Emergency Plans*, Version 2, November 2010.

NUREG CRITERION A.3

Each plan shall include written agreements referring to the concept of operations developed between Federal, State, and local agencies and other support organizations having an emergency response role within the Emergency Planning Zones. The agreements shall identify the emergency measures to be provided and the mutually acceptable criteria for their implementation, and specify the arrangements for exchange of information. These agreements may be provided in an appendix to the plan, or the plan itself may contain descriptions of these matters and a signature page in the plan may serve to verify the agreements. The signature page format is appropriate for organizations where response functions are covered by laws, regulations, or executive orders where separate written agreements are not necessary.

Applicability and Cross-Reference to Plans: Licensee X State X Local X

TO MEET THE INTENT OF CRITERION A.3, ORO PLANS/PROCEDURES SHALL:

- ✓ Identify assisting organizations and the type of assistance (capabilities and resources) they will provide.
- ✓ Include LOAs by reference or in a suitable appendix.
- ✓ Include or reference applicable LOAs between the licensee and ORO including arrangements for access to the NPP site, if appropriate.
- ✓ State that the LOAs include details on what services will be provided and how the agreements will be activated.
- ✓ State that LOAs are reviewed annually to verify their validity. (See also Criterion P.4)

EXPLANATION

Types of support: Supporting an emergency response involves a variety of capabilities. Licensees and OROs may establish agreements with government or private-sector providers to delineate the type of support and assistance they can provide. Government agencies whose functions are inherently emergency response-oriented do not require MOUs/LOAs. Intergovernmental support is increasingly being secured through **mutual assistance compacts** and/or legislation. However, for those support arrangements between jurisdictions that are not covered by mutual assistance compacts, and for support arrangements with private-sector entities, **LOAs** are needed.

Examples of assisting organizations include: OROs; the licensee; laboratories; transportation providers (e.g., bus companies, ambulances); vendors providing resources or other commercial services (e.g., tow trucks); and medical facilities (see Criterion L.1. for additional information on LOAs for medical facilities).

LOAs are required for primary and back-up resources the OROs will utilize in the event of an emergency. OROs can have a separate list of resources to use in the case of extreme emergency when their primary and back-up resources are unavailable. For example, in the unlikely circumstance that the primary and back-up laboratories are unavailable, the emergency manager may have a list of all available resources in the area. This list is not subject to evaluation, but should be considered a best practice for the time it will save in the face of an emergency.

LOA contents: ORO plans/procedures contain summaries of the capabilities and resources available through support organizations. The LOA contents indicate what service(s) will be provided, what organization will provide the service(s), and the point of contact. The agreements also state that OROs ensure vehicle operators and/or other emergency response personnel receive radiological emergency response training. The agreements state that the provider will supply the services as described for emergencies and for training, drills, and exercises, as necessary. In addition, agreements identify the location of the resources to be provided, the 24-hour points of contact for notification and mobilization, and include the signatures of the parties authorized to execute the LOA, and the date. As appropriate, agreements also refer to procedures for authorizing ORO responders to access the NPP site and other areas affected by events.

LOA organization: The plans/procedures may incorporate the required LOAs by reference and catalog them by title, type of agreement, and government level, including signatories and effective dates. If the plans/procedures incorporate LOAs by reference, they include a signed cover sheet certifying the validity of the materials referenced. OROs keep the actual LOA on file available for inspection by FEMA, or they may include the LOAs in an appendix to the plans/procedures.

Annual review: Regardless of how the plans/procedures include the LOAs, States certify their current status annually, typically through the ALC. LOAs either specify an expiration date or contain a statement that the agreement remains in effect until canceled by one of the parties. OROs maintain a list of all LOAs and ask for new LOAs or updated signatories if: (1) the LOA expires or (2) the authorities of the signatories are foreclosed by reorganizations or statutory limitations. The State reports on existing or new LOAs in the ALC submission with a statement that LOAs have been reviewed for accuracy and completeness of information. (See Part IV, *Annual Letter of Certification*, for additional guidance on ALC reporting requirements.) FEMA may also review LOAs during SAVs and/or plan reviews.

REFERENCES

- *National Incident Management System*, December 2008.
- *National Response Framework*, second edition, May 2013.
- *National Response Framework, Nuclear/Radiological Incident Annex*, June 2008.
- *Comprehensive Preparedness Guide 101: Developing and Maintaining State, Territorial, Tribal, and Local Government Emergency Plans*, Version 2, November 2010.

NUREG CRITERION A.4

Each principal organization shall be capable of continuous (24-hour) operations for a protracted period. The individual in the principal organization who will be responsible for assuring continuity of resources (technical, administrative, and material) shall be specified by title.

Applicability and Cross-Reference to Plans: Licensee X State X Local X

TO MEET THE INTENT OF CRITERION A.4, ORO PLANS/PROCEDURES SHALL:

- ✓ Identify key individuals, by title/position, who are responsible for ensuring continuity of resources in support of 24-hour operations.
- ✓ Include a reference to a roster that identifies at least two shifts of key staff, as well as provisions for its maintenance.
- ✓ Identify who is responsible, by title/position, for maintaining the roster and where the roster is located.
- ✓ Indicate the shift period (e.g., 8 or 12 hours), and specify that the outgoing staff will brief the incoming staff on the status of the emergency and the response activities occurring.
- ✓ Describe the responsibilities by the functional areas listed above.

FEMA HIGHLY RECOMMENDS THAT PLANS/PROCEDURES:

- ✓ Describe responsibilities by the five ICS functions.

EXPLANATION

Emergency response activities for a commercial NPP incident may last longer than 1 day. The plans/procedures describe provisions for maintaining the following essential emergency functions around the clock: communications, command and control of operations, alert and notification of the public, accident/incident assessment, information dissemination for the public and media, radiological monitoring, protective response, security, provision of transportation resources, and medical and public health support. The plans/procedures contain the procedures that will ensure continuity of operations throughout one or more change in emergency response personnel.

REFERENCES

- *National Incident Management System*, December 2008
- *National Response Framework*, second edition, May 2013.
- *National Response Framework, Nuclear/Radiological Incident Annex*, June 2008.
- *Comprehensive Preparedness Guide 101: Developing and Maintaining State, Territorial, Tribal, and Local Government Emergency Plans*, Version 2, November 2010.

2. Planning Standard B – Onsite Emergency Organization

On-shift facility licensee responsibilities for emergency response are unambiguously defined; adequate staffing to provide initial facility accident response in key functional areas is maintained at all times; timely augmentation of response capabilities is available; and the interfaces among various onsite response activities and offsite support and response activities are specified.

NOTE: Although there is no requirement for offsite organizations (i.e., OROs) to address this Planning Standard, it is important that OROs understand the *onsite* response organization's structure and authority.

NUREG CRITERION B.1

Each Licensee shall specify the onsite emergency organization of plant staff personnel for all shifts and its relation to the responsibilities and duties of the normal staff complement.

Applicability and Cross-Reference to Plans: Licensee _X_ State __ Local __

NUREG CRITERION B.2

Each licensee shall designate an individual as emergency coordinator who shall be on shift at all times and who shall have the authority and responsibility to immediately and unilaterally initiate any emergency actions, including providing protective action recommendations to authorities responsible for implementing offsite emergency measures.

Applicability and Cross-Reference to Plans: Licensee _X_ State __ Local __

NUREG CRITERION B.3

Each licensee shall identify a line of succession for the emergency coordinator position and identify the specific conditions for higher level utility officials assuming this function.

Applicability and Cross-Reference to Plans: Licensee _X_ State __ Local __

NUREG CRITERION B.4

Each licensee shall establish the functional responsibilities assigned to the emergency coordinator and shall clearly specify which responsibilities may not be delegated to other elements of the emergency organization. Among the responsibilities which may not be delegated shall be the decision to notify and to recommend protective actions to authorities responsible for offsite emergency measures.

Applicability and Cross-Reference to Plans: Licensee _X_ State __ Local __

NUREG CRITERION B.5

Each licensee shall specify the positions or title and major tasks to be performed by the persons to be assigned to the functional areas of emergency activity. For emergency situations, specific assignments shall be made for all shifts and for plant staff members, both onsite and away from the site. These assignments shall cover the emergency functions in Table B-1[21] entitled,"Minimum Staffing Requirements for Nuclear Power Plant Emergencies." The minimum on-shift staffing levels

[21] NUREG-0654/FEMA-REP-1, Revision 1, Table B-1, page 37, October 1980.

shall be as indicated in Table B-1. The licensee must be able to augment on-shift capabilities within a short period after declaration of an emergency. This capability shall be as indicated in Table B-1. The implementation schedule for licensed operators, auxiliary operators, and the shift technical advisor on shift shall be as specified in the July 31, 1980, letter to all power reactor licensees. Any deficiencies in the other staffing requirements of Table B-1 must be capable of augmentation within 30 minutes by September 1, 1981, and such deficiencies must be fully removed by July 1, 1982.

Applicability and Cross-Reference to Plans: Licensee X State ___ Local ___

NUREG CRITERION B.6

Each licensee shall specify the interfaces between and among the onsite functional areas of emergency activity, licensee headquarters support, local service support, and State and local government response organizations. This shall be illustrated in a block diagram and shall include the onsite technical support center and the operational support (assembly) center and the licensee's Emergency Operations Facility (EOF).

Applicability and Cross-Reference to Plans: Licensee X State ___ Local ___

NUREG CRITERION B.7

Each licensee shall specify the corporate management, administrative, and technical support personnel who will augment the plant staff as specified in the table entitled "Minimum Staffing Requirements for Nuclear Power Plant Emergencies," (Table B1) and in the following areas:

a. logistics support for emergency personnel, e.g., transportation, communications, temporary quarters, food and water, sanitary facilities in the field, and special equipment and supplies procurement;

b. technical support for planning and reentry/recovery operations;

c. management level interface with governmental authorities; and

d. release of information to news media during an emergency (coordinated with governmental authorities).

Applicability and Cross-Reference to Plans: Licensee X State ___ Local ___

NUREG CRITERION B.8

Each licensee shall specify the contractor and private organizations who may be requested to provide technical assistance to and augmentation of the emergency organization.

Applicability and Cross-Reference to Plans: Licensee X State ___ Local ___

NUREG CRITERION B.9

Each licensee shall identify the services to be provided by local agencies for handling emergencies, e.g., police, ambulance, medical, hospital, and fire-fighting organizations shall be specified. The licensee shall provide for transportation and treatment of injured personnel who may also be contaminated. Copies of the arrangements and agreements reached with contractor, private, and local support agencies shall be appended to the plan. The agreements shall delineate the authorities, responsibilities, and limits on the actions of the contractor, private organization, and local service support groups.

Applicability and Cross-Reference to Plans: Licensee X State ___ Local ___

3. Planning Standard C – Emergency Response Support and Resources

Arrangements for requesting and effectively using assistance resources have been made, arrangements to accommodate State and local staff at the licensee's Emergency Operations Facility have been made, and other organizations capable of augmenting the planned response have been identified.

NUREG CRITERION C.1

The Federal Government maintains in-depth capability to assist licensees, States, and local governments through the National Response Framework.[22] Each State and licensee shall make provisions for incorporating the Federal response capability into its operation plan, including the following:

NUREG CRITERION C.1.a

Specific persons by title authorized to request Federal assistance; see A.1.d and A.2.a.

Applicability and Cross-Reference to Plans: Licensee X State X Local __

TO MEET THE INTENT OF CRITERION C.1.a, ORO PLANS/PROCEDURES SHALL:

✓ Identify, by title/position, the key officials authorized to request Federal assistance.

EXPLANATION

The key officials authorized to request Federal assistance may be at the State, local, or Tribal level. The Nuclear/Radiological Incident Annex of the NRF describes available Federal assistance.

REFERENCES

- NUREG-1442/FEMA-REP -17, Revision 1, *Emergency Response Resources Guide for Nuclear Power Plant Emergencies*, July 1992.
- NUREG-0654/FEMA-REP-1, Revision 1, *Addenda*, dated March 2002.
- *National Incident Management System*, December 2008.
- *National Response Framework*, second edition, May 2013.
- *National Response Framework, Nuclear/Radiological Incident Annex*, June 2008.
- *National Response Framework, Mass Evacuation Incident Annex*, June 2008.
- *Comprehensive Preparedness Guide 101: Developing and Maintaining State, Territorial, Tribal, and Local Government Emergency Plans*, Version 2, November 2010.

NUREG CRITERION C.1.b

Specific Federal resources expected, including expected times of arrival at specific nuclear facility sites;

Applicability and Cross-Reference to Plans: Licensee X State X Local __

[22] Per NUREG-0654/FEMA-REP-1, Revision 1, Addenda, March 2002, the Federal Radiological Emergency Response Plan (FRERP) superseded the original reference to "a Federal Radiological Monitoring and Assessment Plan, the former Radiological Assistance Plan (RAP), and the Interagency Radiological Assistance Plan (IRAP)." However, the FRERP has since been superseded by the National Response Framework.

TO MEET THE INTENT OF CRITERION C.1.b, ORO PLANS/PROCEDURES SHALL INCLUDE:

- ✓ A process for identifying potential shortfalls in resources.
- ✓ Information on and a list of resources that an ORO can expect to receive from the Federal Government.
- ✓ An estimate of how long it will take those resources to arrive at the desired location.

EXPLANATION

The plans/procedures include an assessment of potential shortfalls in resources (e.g., equipment, personnel, and facilities), indicate how those requirements can be met using outside resources,[23] and include an estimate of the expected time of arrival of Federal resources in order to provide a general planning timeframe. Planning is one of the five ICS functions and its role includes the process of identifying resources that can be provided by Federal agencies.

REFERENCES

- NUREG-1442/FEMA-REP-17, Revision 1, *Emergency Response Resources Guide for Nuclear Power Plant Emergencies*, July 1992.
- *National Incident Management System*, December 2008.
- *National Response Framework, Nuclear/Radiological Incident Annex*, June 2008.
- *Comprehensive Preparedness Guide 101: Developing and Maintaining State, Territorial, Tribal, and Local Government Emergency Plans*, Version 2, November 2010.

NUREG CRITERION C.1.c

Specific licensee, State, and local resources available to support the Federal response, e.g., airfields, command posts, telephone lines, radio frequencies, and telecommunications centers.

Applicability and Cross-Reference to Plans: Licensee X State X Local X

TO MEET THE INTENT OF CRITERION C.1.c, ORO PLANS/PROCEDURES SHALL:

- ✓ Describe the facilities that may be made available to Federal response personnel.
- ✓ Identify the general geographical areas for the locations of these facilities and the unique features of the area.
- ✓ Describe the interoperable communications plans/procedures, equipment, and protocols that may be made available to Federal response personnel.

EXPLANATION

When Federal personnel arrive to assist the OROs in response to an incident, they need access to certain resources, such as clearance into and use of airfields, telephones, and radio communications. In addition, arriving Federal personnel need local personnel to provide information on, and assistance with, the unique features of the area.

REFERENCES

- *National Incident Management System*, December 2008.
- *National Response Framework, Nuclear/Radiological Incident Annex*, January 2008.
- *Comprehensive Preparedness Guide 101: Developing and Maintaining State, Territorial, Tribal, and Local Government Emergency Plans*, Version 2, November 2010.

[23] NUREG-1442, Rev. 1/FEMA-REP-17, Revision 1, *Emergency Response Resources Guide for Nuclear Power Plant Emergencies*, July 1992, is a good resource for this.

NUREG CRITERION C.2.a

Each principal offsite organization may dispatch representatives to the licensee's Emergency Operations Facility. (State technical analysis representatives at the EOF are preferred.)

Applicability and Cross-Reference to Plans: Licensee __ State X Local X

TO MEET THE INTENT OF CRITERION C.2.a, ORO PLANS/PROCEDURES SHALL:

- ✓ Indicate whether the ORO plans to send a representative to the licensee's emergency operations facility and if so, which person, by title/position, would be dispatched.

EXPLANATION

During an incident, OROs may send personnel to the licensee's emergency operations facility to act as liaisons. Typically, these are technical liaisons to coordinate/communicate dose assessment and field monitoring activities with licensee personnel.

REFERENCES

- *National Incident Management System*, December 2008.
- *National Response Framework, Nuclear/Radiological Incident Annex*, January 2008.
- *Comprehensive Preparedness Guide 101: Developing and Maintaining State, Territorial, Tribal, and Local Government Emergency Plans*, Version 2, November 2010.

NUREG CRITERION C.2.b

The licensee shall prepare for the dispatch of a representative to principal offsite governmental emergency operations centers.

Applicability and Cross-Reference to Plans: Licensee X State __ Local __

NUREG CRITERION C.3

Each organization shall identify radiological laboratories, their general capabilities, and expected availability to provide radiological monitoring and analyses services which can be used in an emergency.

Applicability and Cross-Reference to Plans: Licensee X State X Local __

TO MEET THE INTENT OF CRITERION C.3, ORO PLANS/PROCEDURES SHALL:

- ✓ List the laboratories that are qualified to analyze samples of materials that may have been contaminated with radionuclides.
- ✓ Indicate the radiochemical and analytical capabilities of each laboratory (e.g., the ability to analyze milk and other foodstuffs, soil samples, and water samples).
- ✓ Indicate the number of samples the laboratories would be able to process in a given period.
- ✓ Include the location and potential availability of the laboratories.

EXPLANATION

OROs with responsibility for arranging laboratory services identify available laboratories and their capabilities.

REFERENCES

- *National Incident Management System*, December 2008.
- *National Response Framework, Nuclear/Radiological Incident Annex*, January 2008.
- *Comprehensive Preparedness Guide 101: Developing and Maintaining State, Territorial, Tribal, and Local Government Emergency Plans*, Version 2, November 2010.

NUREG CRITERION C.4

Each organization shall identify nuclear and other facilities, organizations, or individuals that can be relied upon in an emergency to provide assistance. Such assistance shall be identified and supported by appropriate letters of agreement.

Applicability and Cross-Reference to Plans: Licensee X State X Local X

TO MEET THE INTENT OF CRITERION C.4, ORO PLANS/PROCEDURES SHALL:

✓ Meet the requirements specified in Criterion A.3.

EXPLANATION

See explanation for Criterion A.3.

REFERENCES

- *National Incident Management System*, December 2008.
- *National Response Framework, Nuclear/Radiological Incident Annex*, January 2008.
- *Comprehensive Preparedness Guide 101: Developing and Maintaining State, Territorial, Tribal, and Local Government Emergency Plans*, Version 2, November 2010.

NUREG CRITERION C.5

The offsite response organization* shall identify liaison personnel to advise and assist State and local officials during an actual emergency in implementing those portions of the offsite plan where State and local response is identified.

Applicability and Cross-Reference to Plans: Licensee X State __ Local __

*FEMA and the NRC developed this criterion as part of Supplement 1 to NUREG-0654/FEMA-REP-1, Rev. 1 to address emergency preparedness when State, Tribal and/or local governments decline to participate in emergency planning. In this criterion only, "offsite response organization" refers to "utility offsite emergency response organization comprised of other participating voluntary and private organizations, and local, State and Federal governments engaging in the development of offsite emergency plans and preparedness for a nuclear power plant." In such cases, these organizations develop, review, and evaluate offsite emergency plans/procedures and preparedness.

NUREG CRITERION C.6

Each organization shall make provisions to enable onsite response support from OROs in a hostile action-based incident as needed.

Applicability and Cross-Reference to Plans: Licensee X State X Local X

TO MEET THE INTENT OF CRITERION C.6, ORO PLANS/PROCEDURES SHALL:

- ✓ Include provisions to allow ORO law enforcement and other initial first responders prompt access to the NPP site.
- ✓ Include provisions for coordination between in-bound response resources and evacuation efforts.
- ✓ Identify any mutual aid agreements for alternate personnel to supplement local resources (see also Criterion A.3).
- ✓ Address radiological training requirements for the primary and alternate personnel.
- ✓ Include procedures for activating qualified alternate personnel.

EXPLANATION

Functionally, licensees establish relationships with OROs to coordinate emergency response efforts in case they are needed. The scope of ORO support includes the implementation of ORO radiological response plans to protect public health and safety in the event of a severe reactor accident and to provide fire, medical, and local law enforcement support to the NPP site. The NRC inspects and FEMA evaluates those relationships and their coordinated response in REP exercises.

An HAB incident involving an NPP, however, could place multiple simultaneous demands on ORO response that need to be considered in radiological plans/procedures.

Coordination between Licensee and OROs: OROs and licensees work together to coordinate/communicate and update emergency plans/procedures as needed to provide prompt access to the NPP site for in-bound first responders. Licensee agreements with OROs (e.g., MOUs or LOAs) are updated to reference the arrangements for access to the NPP site, including during HAB incidents.

In addition, ORO plans/procedures include provisions to ensure that inbound response resources do not become an impediment to evacuation and vice versa. This could include altering evacuation efforts. ORO plans/procedures also include provisions for removal of impediments to in-bound responders.

Alternate Resources: An HAB incident could take ORO resources away from normally assigned radiological response roles and responsibilities in the emergency plan and detract from ORO emergency response capability if plans/procedures do not address this contingency. For example, OROs may not have sufficient personnel to support onsite law enforcement and offsite alert and notification at the same time. Licensees and OROs work together to identify solutions that will ensure timely implementation of emergency response plans/procedures in the event that ORO resource demands are unusually high. For example, an ORO may enter into mutual aid agreements with neighboring jurisdictions and private sector entities, including both for-profit and not-for-profit organizations (sometimes called non-governmental organizations), to identify alternate personnel to supplement local resources.

Evaluation Limited to REP Activities

REP exercises and drills are designed to test the capability of OROs to protect public health and safety through implementation of their *radiological* emergency response plans/procedures in simulated emergencies. FEMA's REP Program does *not* evaluate security and law enforcement tactical response capabilities related to site security contingency plans/procedures. This ensures the confidentiality of sensitive security information.

Rosters: ORO plans/procedures address timely activation of qualified alternate personnel through callout rosters or other methods. The emergency action level and incident classification may indicate that the radiological incident includes HAB elements that would take ORO resources away from normally assigned radiological emergency response roles and responsibilities. In these cases, OROs activate alternate personnel to supplement or backfill, as needed.

Training: The revised ORO plans/procedures address the training for primary and alternate personnel necessary to ensure adequate response when alternate personnel must be mobilized. Radiological training that would be necessary for some functions can be delivered through an online course, in the classroom, or as just-in-time training at a frequency determined in ORO plans/procedures. FEMA encourages participation in drills and exercises to reinforce and to validate planning.

REFERENCES

- *National Incident Management System*, December 2008.
- *National Response Framework, Nuclear/Radiological Incident Annex*, January 2008.
- *Comprehensive Preparedness Guide 101: Developing and Maintaining State, Territorial, Tribal, and Local Government Emergency Plans*, Version 2, November 2010.

4. Planning Standard D – Emergency Classification System

A standard emergency classification and action level scheme, the bases of which include facility system and effluent parameters, is in use by the nuclear facility licensee, and State and local response plans call for reliance on information provided by the facility licensees for determinations of minimum initial offsite response measures.

NUREG CRITERION D.1

An emergency classification and emergency action level scheme as set forth in [NUREG-0654/FEMA-REP-1] Appendix 1 must be established by the licensee. The specific instruments, parameters, or equipment status shall be shown for establishing each emergency class in the inplant emergency procedures. The plan shall identify the parameter values and equipment status for each emergency class.

Applicability and Cross-Reference to Plans: Licensee _X_ State __ Local __

NUREG CRITERION D.2

The initiating conditions shall include the example conditions found in [NUREG-0654/FEMA-REP-1] Appendix 1 and all postulated accidents in the Final Safety Analysis Report (FSAR) for the nuclear facility.

Applicability and Cross-Reference to Plans: Licensee _X_ State __ Local __

NUREG CRITERION D.3

Each State and local organization shall establish an emergency classification and emergency action level scheme consistent with that established by the facility licensee.

Applicability and Cross-Reference to Plans: Licensee __ State _X_ Local _X_

TO MEET THE INTENT OF CRITERION D.3, ORO PLANS/PROCEDURES SHALL:

- ✓ Include reference to the standard Emergency Classification Levels (ECLs).[24]
- ✓ Acknowledge that the ECL system will form the basis for determining the level of response to a nuclear incident that will be consistent with the licensee.

EXPLANATION

Plans/procedures incorporate the ECL system used by the licensee. The purpose of the ECL system is to classify the incident by level of severity to allow for greater levels of response as the seriousness of the incident increases. The four ECLs are Notification of Unusual Event, Alert, Site Area Emergency, and General Emergency.

REFERENCES

- NUREG-0654/FEMA-REP-1, Revision 1, Appendix 1 – *Emergency Action Level Guides for Nuclear Power Plants*, 1980, as modified by *Emergency Planning and Preparedness for Nuclear Power Reactors*, NRC Regulatory Guide 1.101, Revision 3, August 1992.

[24] NUREG-0654/FEMA-REP-1, Revision 1, Appendix 1 – Emergency Action Levels Guidelines for Nuclear Power Plants, October 1980 refers to Emergency Action Levels (EALs) rather than ECLs. Since publication of NUREG-0654, EALs have come to be considered *in-plant* conditions that trigger declaration of various levels of emergencies. These levels of emergencies (NOUE, Alert, SAE, and GE) are referred to as ECLs.

NUREG CRITERION D.4

Each State and local organization should have procedures in place that provide for emergency actions to be taken which are consistent with the emergency actions recommended by the nuclear facility licensee, taking into account local offsite conditions that exist at the time of the emergency.

Applicability and Cross-Reference to Plans: Licensee __ State X Local X

TO MEET THE INTENT OF CRITERION D.4, ORO PLANS/PROCEDURES SHALL:

- ✓ Indicate the emergency actions to be taken to protect the public at each ECL, given the local conditions at the time of the emergency.

EXPLANATION

Appendix 1 to NUREG-0654/FEMA-REP-1 describes each ECL, its purpose, example initiating conditions, and actions to be taken by the licensee and OROs.[25] For OROs, these are the minimum actions taken at the time of the incident, after consideration is given to other factors (e.g., weather, road conditions, and threats). Planners should be aware that guidance on preferred protective actions in a severe accident continues to evolve. For a General Emergency, Appendix 1 of NUREG-0654/FEMA-REP-1 recommends sheltering within a 2-mile radius and 5 miles downwind. However, updated FEMA and NRC guidance in NUREG-0654/FEMA-REP-1, Revision 1, Supplement 3, *Guidance for Protective Action Strategies* (October 2011) provides a protective action logic development tool that should be used by licensees to develop site specific protective action recommendation procedures and is recommended for use by OROs to develop protective action strategy guidance for decision makers.

REFERENCES

- NUREG-0654/FEMA-REP-1, Revision 1, Appendix 1 – *Emergency Action Level Guides for Nuclear Power Plants*, 1980, as modified by *Emergency Planning and Preparedness for Nuclear Power Reactors*, NRC Regulatory Guide 1.101, Revision 3, August 1992.
- NUMARC/NESP-007, Revision 2 – *Methodology for Development of Emergency Action Levels*, January 1992.
- NUREG-0654/FEMA-REP-1, Revision 1, Supplement 3, *Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants – Guidance for Protective Action Strategies*, October 2011.
- *National Incident Management System*, December 2008.
- *National Response Framework, Nuclear/Radiological Incident Annex*, June 2008.
- *Comprehensive Preparedness Guide 101: Developing and Maintaining State, Territorial, Tribal, and Local Government Emergency Plans*, Version 2, November 2010.

[25] NUMARC/NESP-007, Revision 2, The *Methodology for Development of Emergency Action Levels*, January 1992, is considered an acceptable alternative to the method described in NUREG-0654/FEMA-REP-1, Revision 1, Appendix 1 – Emergency Action Levels Guidelines for Nuclear Power Plants. See also Nuclear Energy Institute (NEI) 99-01, Rev. 5, *Methodology for Development of Emergency Action Levels*.

5. Planning Standard E – Notification Methods and Procedures

Procedures have been established for notification by the licensee of State and local response organizations and for notification of emergency personnel by all response organizations; the content of initial and follow-up messages to response organizations and the public has been established; and means to provide early notification and clear instruction to the populace within the plume exposure pathway Emergency Planning Zone have been established.

NUREG CRITERION E.1

Each organization shall establish procedures that describe mutually agreeable bases for notification of response organizations consistent with the emergency classification and action level scheme set forth in [NUREG-0654/FEMA-REP-1] Appendix 1. These procedures shall include means for verification of messages. The specific details of verification need not be included in the plan.

Applicability and Cross-Reference to Plans: Licensee X State X Local X

TO MEET THE INTENT OF CRITERION E.1, ORO PLANS/PROCEDURES SHALL DOCUMENT THE FOLLOWING NOTIFICATION PROCESSES:

- ✓ Initial notification from the licensee to a designated offsite 24-hour warning point (e.g., fire or police department dispatch, 911 emergency center). Offsite plans/procedures indicate the location of the warning point and the method of notification and backup (e.g., commercial telephone, dedicated telephone, fax machine, or pager). If the initial notification from the licensee to the warning point is over a non-secure system, the criterion requires message verification (e.g., via a return call). If the primary means of notification from the licensee to the warning point is on a dedicated system (i.e., one capable of being used only by a known, limited number of organizations), OROs may choose whether to verify receipt of notification.
- ✓ Initial notification to licensee and the ORO when a notification originates from an entity other than the licensee. The plans/procedures identify the points of contact for the licensee and ORO, method of notification and backup, and method of verifying notification.
- ✓ Subsequent notifications from the licensee and/or ORO to other offsite organizations. The plans/procedures may call for subsequent notifications to locations other than the warning point or other designated entities. For example, after the EOC is operational, the plans/procedures may state that all further notifications are made directly to the EOC rather than to the warning point.

EXPLANATION

Notification protocols: OROs have clear and consistent means for providing emergency notification to all responding organizations. Notification of an emergency generally originates with the licensee and then "fans out" to OROs, who then notify their component agencies and support organizations. Governmental units may also be responsible for notifying one another (e.g., the licensee notifies the State, who notifies the local governments; or a risk county notifies its host/support county).

Regulations in 10 CFR Part 50, Appendix E, Section IV.D.3 specify that a licensee is required to have the capability to notify OROs within 15 minutes after declaring an emergency under the licensee's emergency plans/procedures. Licensees make this notification to designated ORO initial warning points. The warning points initiate the chain of notification to all appropriate agencies, as set forth in their notification protocols. The notification chain may include dedicated systems. In an HAB incident, a licensee notifies OROs in accordance with onsite plans/procedures, irrespective of emergency classification level.

The criterion states that notification of response organizations shall be consistent with NUREG-0654/FEMA-REP-1, Appendix 1 – Emergency Action Levels Guidelines for Nuclear Power Plants. This means that notification information includes the appropriate ECL and the plans/procedures indicate the person(s) by title/position who is notified at each ECL.

Information included in the notification from the licensee to the offsite 24-hour warning point is usually recorded on a notification form. The plans/procedures contain a copy of this form, if applicable.

Considerations for HAB incidents: During an HAB incident, these notifications may not follow standard licensee-to-ORO methods. For example, local law enforcement agency points of contact may be notified by the licensee's site security organization of an imminent or actual hostile action against the NPP site prior to the declaration of an emergency by the licensee. In addition, OROs may receive "pre-incident" information from various external sources (e.g., intelligence sources, airports, State/Federal law enforcement agencies), rather than receiving initial notification from the utility. Plans/procedures include methods for ORO notification to the licensee.

The licensee notification pathways (to initial warning points and to local law enforcement agencies) serve different and distinct purposes and may not occur in parallel based on progression of the HAB incident. In addition, licensee notifications to local law enforcement may include sensitive information. ORO plans/procedures address the challenge of ensuring that all appropriate parties required to take immediate action are included when notification through multiple pathways occurs. If local law enforcement agencies receive initial notification or the utility's initial response to an HAB incident at the NPP is direct interaction with local law enforcement, this could result in inadvertent delays or bypassed notifications to emergency management agencies and State/local warning points, especially if the incident is resolved before any assistance is requested beyond local law enforcement agencies.

To prepare for HAB incidents, OROs ensure that emergency response plans/procedures include a notification process that works in all directions (not just from the utility/licensee to NRC and OROs). OROs develop procedures for verifying the information and initiating notifications from alternate entities (e.g., the Joint Terrorism Task Force, Fusion Centers, 911, emergency management agencies, local law enforcement agencies). If law enforcement responds to an HAB incident that has the potential to impact an NPP, plans/procedures include provisions to notify the site and the appropriate emergency management agencies.

REFERENCES

- NUREG-0654/FEMA-REP-1, Revision 1, Appendix 1 – *Emergency Action Level Guides for Nuclear Power Plants*, 1980, as modified by *Emergency Planning and Preparedness for Nuclear Power Reactors*, NRC Regulatory Guide 1.101, Revision 3, August 1992.

NUREG CRITERION E.2

Each organization shall establish procedures for alerting, notifying, and mobilizing emergency response personnel.

Applicability and Cross-Reference to Plans: Licensee X State X Local X

TO MEET THE INTENT OF CRITERION E.2, ORO PLANS/PROCEDURES SHALL:

- ✓ Indicate who, by title/position, is responsible for notifying each staff member, either by including a notification call list or making reference to such a list.
- ✓ Describe the process used to notify all applicable OROs once the 24-hour warning point, or other designated entity, has received and verified the initial notification, if necessary.
- ✓ Describe who, by title/position, has the responsibility for notifying all appropriate organizations once the initial notification to the 24-hour warning point has been made. For example, the responsibility of the warning point for notifications may end after it places a call to the State and county emergency management agencies. A diagram that shows how the notification process works (e.g., call-down) may supplement a plan/procedure description.
- ✓ Indicate the specific notifications made at each ECL.
- ✓ Indicate the means by which notifications will be accomplished (e.g., pagers, telephones, radios, auto dialers).

EXPLANATION

Offsite plans/procedures document the process by which the staff of appropriate response organizations are alerted, notified, and mobilized to support the organizations' response roles.

As a best practice, consideration should be given to contacting other States and/or jurisdictions outside the 50 mile EPZ and keeping them apprised of the situation as it progresses.

REFERENCES

- *National Incident Management System*, December 2008.
- *National Response Framework*, second edition, May 2013.
- *National Response Framework, Nuclear/Radiological Incident Annex*, June 2008.
- *Comprehensive Preparedness Guide 101: Developing and Maintaining State, Territorial, Tribal, and Local Government Emergency Plans*, Version 2, November 2010.

NUREG CRITERION E.3

The licensee, in conjunction with State and local organizations, shall establish the contents of the initial emergency messages to be sent from the plant. These measures shall contain information about the class of emergency, whether a release is taking place, potentially affected population and areas, and whether protective measures may be necessary.

Applicability and Cross-Reference to Plans: Licensee _X_ State __ Local __

NUREG CRITERION E.4

Each licensee shall make provisions for follow-up messages from the facility to offsite authorities that shall contain the following information if it is known and appropriate:

a. ***location of incident and name and telephone number (or communications channel identification) of caller;***
b. ***date/time of incident;***
c. ***class of emergency;***
d. ***type of actual or projected release (airborne, waterborne, surface spill) and estimated duration/impact times;***
e. ***estimate of quantity of radioactive material released or being released and the points and height of releases;***
f. ***chemical and physical form of released material, including estimates of the relative quantities and concentration of noble gases, iodines, and particulates;***
g. ***meteorological conditions at appropriate levels (wind speed, direction (to and from), indicator of stability, precipitation, if any);***
h. ***actual or projected dose rates at site boundary; projected integrated dose at site boundary;***
i. ***projected dose rates and integrated dose at the projected peak at 2, 5, and 10 miles, including sector(s) affected;***
j. ***estimate of any surface radioactive contamination in the plant, onsite or offsite;***
k. ***licensee emergency response actions underway;***
l. ***recommended emergency actions, including protective measures;***
m. ***request for any needed onsite support by offsite organizations; and***
n. ***prognosis for worsening or termination of event based on plant information.***

Applicability and Cross-Reference to Plans: Licensee _X_ State __ Local __

NUREG CRITERION E.5

State and local government organizations shall establish a system for disseminating to the public appropriate information contained in initial and follow-up messages received from the licensee, including the appropriate notification to appropriate broadcast media, e.g., the Emergency Alert System (EAS.)[26]

Applicability and Cross-Reference to Plans: Licensee X State X Local X

TO MEET THE INTENT OF CRITERION E.5, ORO PLANS/PROCEDURES SHALL:

- ✓ List the broadcast stations and other systems (e.g., tone alert radios, route alerting) used to provide emergency instructions to the public.
- ✓ Establish individual responsibilities for each broadcast station and system and document commitments between them and the ORO (e.g., MOUs and/or LOAs) to honor these responsibilities in a radiological emergency. (Also see Criterion A.3.)
- ✓ Document or reference the broadcast stations' or systems' capability to participate in the public notification process. A statement that the station participates in a "Local Emergency Alert System Operational Area Plan" is considered satisfactory.
- ✓ Identify broadcast station and system points of contact, by title/position, who are accessible 24 hours a day, 7 days a week. (Also see Criterion A.4.)
- ✓ Establish the interval for broadcasting official information statements.
- ✓ Identify an alternate station, if a selected station does not have a backup power supply.

FEMA HIGHLY RECOMMENDS THAT PLANS/PROCEDURES:

- ✓ Establish protocols for broadcasting emergency instructions directly from an EOC through radio and television stations, if this capability is available.

EXPLANATION

ORO plans/procedures describe the broadcast stations and other systems (e.g., tone alert radios, route alerting) used to provide emergency instructions to the public. An acceptable system has the capability to broadcast official information 24 hours a day, 7 days a week, notwithstanding adverse environmental conditions, such as floods and power outages. Federal Communications Commission (FCC) regulations require that Emergency Alert System (EAS) stations maintain 24-hour capability to interrupt broadcasts regardless of whether they are broadcasting live or relaying programming.

To effectively notify the public, EAS repeats the EAS messages multiple times. Establishing set intervals ensures maximum coverage. Plans/procedures address broadcast intervals, as well as the mechanism for advising the EAS station to discontinue messages that no longer apply.

REFERENCES

- Federal Register, Volume 59, p. 67090, *Federal Communications Commission Report and Order replacing the Emergency Broadcast System (EBS) with the Emergency Alert System (EAS)*, December 28, 1994.
- NUREG-0654/FEMA-REP-1, Revision 1, *Addenda*, dated March 2002.
- *National Incident Management System*, December 2008.
- *National Response Framework*, second edition, May 2013.

[26] Per NUREG-0654/FEMA-REP-1, Revision 1, Addenda, March 2002, the Emergency Broadcast System was replaced by the Emergency Alert System by Report and Order 59 FR 67090, issued by the Federal Communications Commission on December 28, 1994.

- *National Response Framework, Emergency Support Function #15 – External Affairs Annex*, May 2013.
- *National Response Framework, Public Affairs Support Annex*, May 2013.
- *National Response Framework, Nuclear/Radiological Incident Annex*, June 2008.
- *Comprehensive Preparedness Guide 101: Developing and Maintaining State, Territorial, Tribal, and Local Government Emergency Plans*, Version 2, November 2010.

NUREG CRITERION E.6

Each organization shall establish administrative and physical means, and the time required for notifying and providing prompt instruction to the public within the plume exposure pathway Emergency Planning Zone. (See [NUREG-0654/FEMA-REP-1] Appendix 3) It shall be the licensee's responsibility to demonstrate that such means exist, regardless of who implements this requirement. It shall be the responsibility of the State and local governments to activate such a system.

Applicability and Cross-Reference to Plans: Licensee X State X Local X

TO MEET THE INTENT OF CRITERION E.6, ORO PLANS/PROCEDURES SHALL:

- ✓ State that the Alert and Notification System (ANS) is capable of meeting the 15-minute design objective.
- ✓ Describe the primary and backup physical means of alert and notification, including the system(s) used to alert and notify the general public, persons with disabilities and access/functional needs, and exception areas, and their respective point(s) of activation.
- ✓ Describe the administrative means of alert and notification, including:
  - ✓ The title of the organizations or individuals responsible for: (1) making the decision to activate the ANS and (2) activating the system;
  - ✓ The ANS activation procedures and time required to implement these procedures; and
  - ✓ A discussion of how the requirements for periodic siren testing will be accomplished.

EXPLANATION

This criterion addresses the means to alert and notify the public within the plume exposure pathway that there is an incident at the NPP. "Alert" refers to the process used to get the attention of the public. "Notification" refers to the process used to supply detailed information and instructions following the alert signal. The criterion covers both the administrative procedures and the physical means for alert and notification of the public. The description of the *physical means* addresses the methods and equipment incorporated for alerting the public. The *administrative procedures* describe the interaction of the various organizations, as well as the responsibility of each organization involved in the alert and notification sequence. For further information regarding ANS design objectives and the primary and backup physical means of alert and notification, see Section V, Part A of this Manual. NUREG-0654/FEMA-REP-1 Appendix 3 (as amended by Supplement 4) and 44 CFR § 350.5(a) provide addition information and authorities regarding alert and notification.

a. Design Objectives for Alert and Notification of the Public

NUREG-0654/FEMA-REP-1 Appendix 3 (as amended by Supplement 4), 44 CFR § 350.5(a), and Section V, Part A of this Manual, discuss ANS design objectives. The minimum acceptable design objectives for coverage by an ANS – what the system must be able to do when speed is critical – include:

- The capability for: (1) providing an alert signal and beginning an informational or instructional message to the population in the 10-mile EPZ within 15 minutes and (2) providing protective action recommendations (PARs), if appropriate.
- The direct coverage of essentially 100 percent of the population within 5 miles of the NPP site.
- The coverage of essentially 100 percent of the population in the remaining areas of the plume exposure EPZ (i.e., from 5 to 10 miles from the NPP) who may not have received the initial notification (see the "exception areas for primary alerting" discussion below). This notification must occur within 45 minutes.
- A backup means of public alert and notification capable of covering essentially 100 percent of the population in the plume exposure EPZ in the event the primary method is unavailable. The backup means of alert and notification shall be conducted within a reasonable time, with a recommended goal of 45 minutes (see the "backup systems" discussion below).

Design Objectives Are for Worst-Case Scenarios

The alert and notification system must be capable of meeting design objectives in the event of a rapidly-escalating incident. Even if the incident is not escalating rapidly, the initial notification of the affected populations within the plume exposure pathway EPZ must be completed in a manner consistent with assuring the public health and safety (i.e., in a timely manner and without undue delay).

Essentially 100 percent

A system must be able to cover 100% of all the populated areas of an EPZ. This is not an attempt to measure that 100% of the EPZ population was reached, only that the ability exists to reach the entire population.

Primary alert and notification: The ANS must be capable of providing alert signals and instructional messages to the entire 10-mile EPZ, including remote and low-population areas within 15 minutes of the decision to notify the public. The requirements include alerting and notifying the transient population in remote rural areas, open water areas, rivers, hunting areas, recreational areas, and other low-population areas that may need special alerting procedures.

Exceptions areas for primary alerting: In rural, low-population areas in the 10-mile EPZ that are beyond 5 miles from the NPP, up to 45 minutes may be allowed for providing an alert signal and instructional message to the permanent and transient populations. Such areas proposed for 45-minute alert and notification status are called "exception areas" and must be reviewed and approved by FEMA on a case-by-case basis.

Backup systems: Supplement 4 to NUREG-0654/FEMA-REP-1 includes a new requirement for backup ANSs. Backup means of alert and notification will differ from facility to facility. The backup means may be designed so that it can be implemented using a phased approach in which the populations most at risk (e.g., within 2 miles) are alerted and notified first, followed by alerting and notification of people in less immediately affected areas (e.g., 2 to 5 miles, followed by downwind 5 to 10 miles, and finally the remaining population as directed by authorities). The backup method may have the additional capability of being employed only in the specific areas impacted when a portion of the primary ANS, such as a single siren or group of sirens within a community, fails and the extent of the affected area and population can be determined.

Topography, population density, existing ORO resources, and timing will be considered in judging the acceptability of backup means of alert and notification. Although circumstances may not allow this for all situations, FEMA and the NRC recommend that OROs and licensees attempt to establish backup means of alert and notification. In the event that the primary alert and notification fails, the ORO should notify those affected. The notification should occur within 45 minutes (recommended goal) from the time the failure is initially acknowledged.

Exhibit II-3: Design Objectives for Alert and Notification of the Public*

Design Objective:	Within 15 minutes	Within 45 minutes	Within a Reasonable Time
Primary Alert and Notification			
…covering essentially 100% of the 10-mile EPZ	X		
Primary Alert and Notification in Exception Areas			
…covering FEMA-approved exception areas (rural, low-population areas beyond 5 miles but less than 10 miles from the NPP)		X	
Backup Alert and Notification			
…covering the 10-mile EPZ			X

* Demonstration standards for alert and notification of the public during evaluated REP exercises are discussed in Part III, Assessment Area 5 – Emergency Notification and Public Information of this Manual.

b. Physical Means of Alert and Notification

Equipment: FEMA recognizes fixed sirens, route alerting, tone alert radios, and National Oceanic and Atmospheric Administration (NOAA) weather radio as approved primary and backup alert systems. The EAS, NOAA weather radio, and route alerting are approved notification systems. OROs may submit alternative systems for approval if they can document that the system meets the design objectives specified above. OROs may use alternative systems that have not received FEMA approval concurrently with approved systems to augment the alert and notification process.

The Integrated Public Alert and Warning System (IPAWS) is a modernization and integration of the nation's alert and warning infrastructure that will save time when time matters; when protecting life and property.

Federal, State, territorial, Tribal, and local alerting authorities may choose to use IPAWS and may also integrate local systems that use Common Alerting Protocol (CAP) standards with the IPAWS infrastructure. IPAWS will give public safety officials an effective way to alert and warn the public about serious emergencies using the Emergency Alert System (EAS), the Commercial Mobile Alert System (CMAS), National Oceanic and Atmospheric Administration (NOAA) Weather Radio, and other public alerting systems from a single interface.

FEMA strongly encourages the integration of IPAWS with offsite alert and notification plans. As IPAWS is adopted nationwide, technical and planning assistance is available for State, territorial, tribal, and local alerting authorities.

Route alerting: If route alerting is used, the plans/procedures describe the situations in which route alerting would be used (primary, backup), methods of performance, travel routes, resource coordination/allocation, public instructions issued, and the responsible personnel or organization(s).

Design report: Regardless of the physical means comprising the system, the licensee provides a design report to FEMA describing the ANS. The design report contains sufficient information for FEMA to conduct a review and make a determination as to its acceptability prior to activating the ANS for the purposes of conducting a public telephone survey to satisfy the alert and notification requirements in 44 CFR § 350.9(a).

Telephone survey: FEMA, in cooperation with the utility operator and/or State and local governments, conducts telephone surveys immediately following activation of a newly developed and implemented ANS, as described in Appendix 3 of NUREG-0654/FEMA-REP-1, prior to FEMA certification of the ANS. At FEMA's discretion, a repeat telephone survey may be conducted as part of its review of any "significant change" to an ANS. A "significant change" involves a change in the

method of primary alerting used to alert the majority of the residents in an EPZ, or a change that calls into question the validity of the telephone survey used to support the existing FEMA acceptance of the ANS.

A discussion of the *physical means* of public notification in OROs' plans/procedures includes:

- **A description of the primary alert system**(s) used to provide an alert signal to the public (e.g., fixed sirens, tone alert radios, route alerting), including systems for persons with disabilities and access/functional needs (e.g., telecommunication devices for the hearing-impaired). The description also identifies any approved exception areas and the primary alert system(s) for those areas.
- **A description of the backup alert system**(s) used to provide an alert signal to the public in the event of a partial or complete failure in the primary system. The backup system may be comprised of the same types of systems approved for primary alerting, but is a redundant system.
- **A description of the notification system**(s) used to provide information and instructions to the public once they have been alerted. These could include, but are not limited to, the EAS, NOAA weather radio, special news broadcasts, etc.

c. Administrative Means of Alert and Notification

A description of the *administrative procedures* in OROs' plans/procedures includes:

- The **title of the organizations or individuals responsible** for: (1) making the decision to activate the ANS and (2) activating the system. The procedures also specify back-up organizations or individuals to ensure timely notification and mobilization.
- The **ANS activation procedures** and an analysis of the time required to implement these procedures. The discussion demonstrates that, once the designated official has made the decision to notify the public of the status of the emergency and the possible need for protective actions, the 15-minute design objective can be met if circumstances require it.
- The procedures and safeguards used to ensure that the appropriate officials send a legitimate and clearly understood **command to activate the ANS** to the individuals responsible for physically activating the system. The procedures and safeguards also ensure that these persons recognize, understand, and take appropriate actions in response to such a command.
- A description of **procedures and point(s) of activation** for the: (1) system(s) to alert and notify the general public, (2) system(s) to alert and notify persons with disabilities and access/functional needs (e.g., telecommunication devices for the hearing impaired) and facilities for persons with disabilities and access/functional needs, and (3) system(s) used to alert and notify transient populations (e.g., hunters, beach users, boaters).
- A discussion of how **periodic siren testing** will be accomplished. The types of tests and suggested frequency are described in Appendix 3 to NUREG0654/FEMA-REP-1. They include a silent test every 2 weeks (log entry), a growl test quarterly and when preventive maintenance is performed, and a complete cycle test at least annually.

The operability of a siren system is deemed acceptable when an average of 90 percent of the sirens is functional in a given testing period. The licensee or the responsible ORO authority submits the results of the siren system tests annually to the appropriate FEMA Region. This information may be submitted as part of the ALC (see Part IV of this manual). The FEMA Region is responsible for reviewing the test results to ensure that siren operability remains at or above 90 percent.[27]

[27] Section V, Part A of this Manual, describes routine siren testing procedures and operability requirements.

REFERENCES

- NUREG-0654/FEMA-REP-1, Revision 1, Appendix 3, *Means for Providing Prompt Alerting and Notification of Response Organizations and the Population*, October 1980.
- FEMA GM AN-1, *FEMA Action to Qualify Alert and Notification Systems Against NUREG-0654/FEMA-REP-1*.
- *National Incident Management System*, December 2008.
- *National Response Framework*, second edition, May 2013.
- *National Response Framework, Emergency Support Function #15 – External Affairs Annex*, May 2013.
- *National Response Framework, Public Affairs Support Annex*, May 2013.
- *National Response Framework, Nuclear/Radiological Incident Annex*, June 2008.
- *Comprehensive Preparedness Guide 101: Developing and Maintaining State, Territorial, Tribal, and Local Government Emergency Plans*, Version 2, November 2010.
- NUREG-0654/FEMA-REP-1, Revision 1, Supplement 4, *Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants – Criteria for National Preparedness Initiative Integration, Exercise Enhancement, and Backup Alert and Notification Systems*, 2011.

NUREG CRITERION E.7

Each organization shall provide written messages intended for the public, consistent with the licensee's classification scheme. In particular, draft messages to the public giving instructions with regard to specific protective actions to be taken by occupants of affected areas shall be prepared and included as part of the State and local plans. Such messages should include the appropriate aspects of sheltering, ad hoc respiratory protection, e.g., handkerchief over mouth,29F thyroid blocking, or evacuation. The role of the licensee is to provide supporting information for the messages. For ad hoc respiratory protection see "Respiratory Protective Devices Manual" American Industrial Hygiene Association, 1963, pp. 123-126.

Applicability and Cross-Reference to Plans: Licensee X State X Local X

TO MEET THE INTENT OF CRITERION E.7, IF THE ORO COMPOSES MESSAGES FOR DISTRIBUTION TO THE PUBLIC, PLANS/PROCEDURES SHALL INCLUDE AND/OR REFERENCE:

- ✓ EAS message templates that would be modified as necessary and sent to the EAS station(s) for broadcast;
- ✓ Provisions for special news broadcasts as supplements to the EAS message;
- ✓ Provisions for foreign language translations of EAS messages and special news broadcasts, if required;
- ✓ The process for selecting, modifying, approving, and releasing messages; and
- ✓ The methodology for EAS message rebroadcast, along with the frequency (how many times and at what interval, such as every 15 minutes).

EXPLANATION

The first part of this criterion involves ensuring that the organization's plans/procedures include the specified items. The second involves a review of EAS messages, if applicable to the organization involved. When FEMA reviews the plans/procedures, the ORO provides a complete set of message templates for analysis.

Initial messages: OROs responsible for developing public information messages create pre-scripted EAS messages that can be modified as necessary and sent to the EAS station(s) for broadcast. Plans/procedures discuss the process of transforming the Protective Action Decisions (PADs) made by responsible authorities into a format understandable to the public. The messages used in an emergency include at minimum:

- Identification of the ORO and the official with authority for providing the EAS alert signal and instructional message;
- Identification of the commercial NPP and a statement that an emergency exists at the NPP;
- Reference to REP-specific emergency information (e.g., brochures, calendars, information in telephone books) for use by the general public during an emergency; and
- A closing statement asking the affected and potentially affected populations to stay tuned for additional information or tune to another station for more information, such as special news broadcasts.

Plans/procedures discuss the process for modifying or selecting pre-scripted, including computer-generated, EAS messages for broadcast. They also address process of issuing messages to the EAS station and the process by which messages are reviewed by a responsible official prior to being released to the EAS station. In addition, ORO plans/procedures discuss the methodology for EAS message rebroadcast, along with the frequency (how many times and at what interval, such as every 15 minutes). The memory capacity of the EAS equipment is identified for each station if different from the 2-minute minimum standard.

Follow-up messages: OROs also develop special news broadcasts as supplements to the EAS message. These special news broadcasts are prepared and disseminated in a timely manner after the EAS message is broadcast. If not already clearly mentioned in the EAS message(s), these broadcasts identify:

- Precautionary protective actions, if any, for persons with disabilities and access/functional needs (e.g., school children, transportation-dependent individuals) or by location (e.g., public parks, beaches);
- Any protective actions for the general public described using familiar landmarks (e.g., political jurisdictions, major highways, rivers, railroads, zip codes);
- Evacuation routes by affected areas (e.g., area XYZ uses route ABC) with a description that includes a means of translating the area covered by PADs from the format used by the OROs into familiar landmarks and boundaries for use in the messages;
- Methods to maximize protection when requested to shelter-in-place (e.g., remain inside, close all windows and doors, shut off any forced air systems [heating or air-conditioning]);
- Public inquiry telephone numbers available to the public, as well as appropriate responses to rumors and public inquiries;
- Ingestion-related instructions and information, when applicable; and
- What evacuees should or should not take with them when evacuating (e.g., livestock, household pets).

Plans/procedures describe the method used to release special news broadcasts, such as press releases read over the air, live interviews by station personnel with ORO officials, or live or recorded messages from the ORO's EOCs.

Plans/procedures discuss the process by which the contents of public information (e.g., EAS messages, press releases, special news broadcasts, etc.) can be adapted to take into account and counter rumors that may impact the public's willingness to follow instructions issued by authorities.

Non-English language messages: At a minimum, EAS messages and special news broadcasts shall be translated into any non-English language spoken by more than 10,000 individuals or more than 5% of the total voting age citizens in a single political subdivision (usually a county, but a township or municipality in some States) within the EPZ.[28] If required, plans/procedures address the process of developing and broadcasting foreign language messages. OROs make arrangements to ensure that the content of foreign-language messages is consistent with the English messages. This may be accomplished by having the written foreign-language messages translated into English and compared with the text of the original English messages. When foreign-language messages are required, they are included in the plans/procedures or otherwise provided to the reviewer.

REFERENCES

- Memorandum from Margaret Lawless to RAC Chairpersons, *Guidance on Planning Requirements Whenever Changes Are Made to Existing 10-mile EPZs*, June 25, 1993.
- Memorandum from Kay Goss to Regional Directors, *Guidance for Providing Emergency Information and Instructions to the Public for Radiological Emergencies Using the New Emergency Alert System (EAS)*, February 2, 1999.
- NUREG-0654/FEMA-REP-1, Revision 1, *Addenda*, dated March 2002.

[28] See Part IV, Section S. Public Information Guide and Process.

6. Planning Standard F – Emergency Communications

Provisions exist for prompt communications among principal response organizations to emergency personnel and to the public.

NUREG CRITERION F.1

The communication plans for emergencies shall include organizational titles and alternates for both ends of the communication links. Each organization shall establish reliable primary and backup means of communications for licensees, local, and State response organizations. Such systems should be selected to be compatible with one another. Each plan shall include:

NUREG CRITERION F.1.a

Provision for 24-hour per day notification to and activation of the State/local emergency response network; and, at a minimum, a telephone link and alternate, including 24-hour per day manning of communications links that initiate emergency response actions;

Applicability and Cross-Reference to Plans: Licensee X State X Local X

TO MEET THE INTENT OF CRITERION F.1.a. ORO PLANS/PROCEDURES SHALL:

- ✓ Describe the equipment used (e.g., dedicated telephone line or specific radio net) for notifying and communicating with the organization's personnel and other response organizations. The equipment must include a primary link and alternate means of communication.
- ✓ Describe the system used to ensure 24-hour availability to receive and pass along notifications. The system is generally a continuously staffed warning point (e.g., a police dispatch center) or a duty officer system in which the designated duty officer carries a pager.

FEMA HIGHLY RECOMMENDS THAT PLANS/PROCEDURES:

- ✓ Include a diagram depicting communication links.

EXPLANATION

This criterion addresses communication systems used to activate emergency response organizations and communicate with them during a radiological emergency. The plans/procedures describe the communication systems that are used to implement the organization's role in this process, including staff, equipment, and procedures.

REFERENCES

- *National Incident Management System*, December 2008.
- *Comprehensive Preparedness Guide 101: Developing and Maintaining State, Territorial, Tribal, and Local Government Emergency Plans*, Version 2, November 2010.

NUREG CRITERION F.1.b

Provision for communication with contiguous State/local governments within the Emergency Planning Zones;

Applicability and Cross-Reference to Plans: Licensee X State X Local X

TO MEET THE INTENT OF CRITERION F.1.b, ORO PLANS/PROCEDURES SHALL DESCRIBE:

- ✓ Primary and backup communication capability between all local governments within the plume EPZ;
- ✓ Primary and backup communication capability between each local government and any associated host/support counties located outside the plume EPZ; and
- ✓ Primary and backup communication capability between each State government and all local governments within its jurisdiction and with other State governments within the plume and/or ingestion EPZ.

EXPLANATION

The plans/procedures describe the systems, both primary and backup, used to communicate with other governments at the State, local, or Tribal level, including communications to and from alternate EOCs, if appropriate. The particular system(s) available are identified (e.g., ordinary [switched] commercial telephone, dedicated telephone line, county law enforcement radio net, National Warning System).

All the above capabilities include at least two separate systems, at least one of which is independent of the switched commercial telephone system.

REFERENCES

- *National Incident Management System*, December 2008.
- *Comprehensive Preparedness Guide 101: Developing and Maintaining State, Territorial, Tribal, and Local Government Emergency Plans*, Version 2, November 2010.

NUREG CRITERION F.1.c

Provision for communications, as needed, with Federal emergency response organizations;

Applicability and Cross-Reference to Plans: Licensee X State X Local X

TO MEET THE INTENT OF CRITERION F.1.c, ORO PLANS/PROCEDURES SHALL DESCRIBE:

- ✓ The system(s) available for communicating with Federal response organizations (e.g., ordinary commercial telephone, dedicated telephone lines, or radio nets).
- ✓ The primary system and at least one backup system.

EXPLANATION

To ensure coordination with Federal support, OROs must be able to communicate effectively with Federal emergency response organizations. The plans/procedures identify the particular system(s) that will be used for this communication. Some plans/procedures may provide that some or all communications with Federal response organizations will be relayed through another organization (e.g., local communications with Federal response organizations will be through the State).

Response to an HAB incident may require expansion of the traditional REP communication capabilities. Specific issues may include: 1) the need for interoperable, redundant, and reliable communication with the licensee and among the EOC and Incident Command elements (Incident Command Post/Unified Command and staging areas); 2) the need for interoperable,

redundant, and reliable communication with non-traditional REP entities and locations (e.g., staging areas, Incident Command Posts, FBI, FEMA, and HHS); 3) the need for procedures (safeguards) for the sharing of sensitive information during HAB incidents between and among Federal, State, local, and Tribal agencies and the licensee; and 4) the need for primary and backup communication (safeguards) to support the exchange of sensitive information.

To ensure effective communications during HAB incidents, communication protocols and methods are designed to ensure effective and timely communications between command elements and, where appropriate, tactical response elements.

REFERENCES

- *National Incident Management System*, December 2008.
- *National Response Framework, Nuclear/Radiological Incident Annex*, June 2008.
- *Comprehensive Preparedness Guide 101: Developing and Maintaining State, Territorial, Tribal, and Local Government Emergency Plans*, Version 2, November 2010.

NUREG CRITERION F.1.d

Provision for communications between the nuclear facility and the licensee's Emergency Operations Facility, State and local emergency operations centers, and radiological monitoring teams;

Applicability and Cross-Reference to Plans: Licensee X State X Local X

TO MEET THE INTENT OF CRITERION F.1.d, ORO PLANS/PROCEDURES SHALL DESCRIBE:

- ✓ The primary and backup communication systems that provide links to the emergency operations facility; and
- ✓ For jurisdictions that deploy radiological monitoring and other field teams, the primary and backup systems used to communicate with the teams.

EXPLANATION

Each jurisdiction's plans/procedures describe the specific systems used to communicate with the licensee (e.g., ordinary commercial telephone, dedicated telephone line, or particular radio net). The plans/procedures specify the primary system and at least one backup system for communication with the emergency operations facility.

Plans/procedures describe primary and backup systems for interoperable communication among all components of incident command. For jurisdictions that deploy radiological monitoring and other field teams (e.g., law enforcement, fire/HAZMAT, emergency medical), the plans/procedures describe primary and backup systems used to communicate with those teams. Typically, the system will be a radio net, cellular telephones, or radios in the vehicles used by the field teams. The teams should generally be able to contact a base when operating within the plume EPZ.[29] The plans/procedures indicate the location of the base (or indicate mobile) and specify what organization operates it.

REFERENCES

- FEMA-REP-2, Rev. 2, *Guidance on Offsite Emergency Radiation Measurement Systems, Phase 1 – Airborne Release*, June 1990.
- *National Incident Management System*, December 2008.
- *National Response Framework, Nuclear/Radiological Incident Annex*, June 2008.
- *Comprehensive Preparedness Guide 101: Developing and Maintaining State, Territorial, Tribal, and Local Government Emergency Plans*, Version 2, November 2010.

[29] Hilly terrain may cause gaps or holes in radio coverage. These gaps should be kept relatively small so the teams need only drive a few minutes in order to make radio contact.

NUREG CRITERION F.1.e

Provision for alerting or activating emergency personnel in each response organization;

Applicability and Cross-Reference to Plans: Licensee X State X Local X

TO MEET THE INTENT OF CRITERION F.1.e, ORO PLANS/PROCEDURES SHALL:

- ✓ Contain a general description of how personnel are activated (i.e., notified of an incident and requested to report to their emergency duty station).
- ✓ Include or reference lists of names and phone numbers of personnel to alert or activate based on the ECL.

EXPLANATION

The notification process will continue to the level of notifying specific personnel. For a given jurisdiction, usually one person (e.g., a dispatcher) is responsible for either notifying all personnel or alerting a short list of agency contacts, who in turn alert their agency staff.

The lists of response staff names and telephone numbers may be withheld from the plans/procedures and replaced with a reference indicating where this information may be attained (e.g., EOC, county building, or dispatch center).

REFERENCES

- *National Incident Management System*, December 2008.
- *National Response Framework*, second edition, May 2013.
- *National Response Framework, Nuclear/Radiological Incident Annex*, June 2008.
- *Comprehensive Preparedness Guide 101: Developing and Maintaining State, Territorial, Tribal, and Local Government Emergency Plans*, Version 2, November 2010.

NUREG CRITERION F.1.f

Provision for communication by the licensee with NRC headquarters and NRC Regional Office Emergency Operations Centers and the licensee's Emergency Operations Facility and radiological monitoring team assembly area.

Applicability and Cross-Reference to Plans: Licensee X State __ Local __

NUREG CRITERION F.2

Each organization shall ensure that a coordinated communication link for fixed and mobile medical support facilities exists.

Applicability and Cross-Reference to Plans: Licensee X State X Local X

TO MEET THE INTENT OF CRITERION F.2, ORO PLANS/PROCEDURES SHALL INCLUDE FOR ALL PRIMARY AND BACKUP HOSPITALS/MEDICAL FACILITIES AND AMBULANCES WITH A ROLE IN THE TRANSPORTATION AND TREATMENT OF CONTAMINATED INJURED INDIVIDUALS:

- ✓ Identification of communications links between the ambulance and the designated hospital/medical facilities; and
- ✓ A description of primary and backup communications among the hospital/medical facilities, the jurisdiction's EOC, and the licensee.

EXPLANATION

This criterion is intended to ensure that an effective means of communication has been established among the licensee, local emergency response organizations, and ambulances and hospitals/medical facilities involved in transportation and treatment of contaminated, injured, or exposed individuals. The transport crew is able to communicate directly with the receiving hospital/medical facility to provide information such as the patient's condition, estimated exposure, presence of contamination, and estimated time of arrival, and/or to seek medical advice on patient treatment. Local EOCs have procedures to coordinate pickup of patients, routing of ambulances, and provision of assistance for radiological monitoring.

Mobile medical facilities include aid camps, triage stations, and other temporary medical care locations used for response.

REFERENCES

- The Joint Commission: Hospital, Emergency Management Chapter, Standard EM.02.02.05, July 2012.
- *National Incident Management System*, December 2008.
- *Comprehensive Preparedness Guide 101: Developing and Maintaining State, Territorial, Tribal, and Local Government Emergency Plans*, Version 2, November 2010.

NUREG CRITERION F.3

Each organization shall conduct periodic testing of the entire emergency communications system (see [NUREG-0654/FEMA-REP-1] Evaluation Criteria H.10 and N.2.a, and Appendix 3.)

Applicability and Cross-Reference to Plans: Licensee X State X Local X

TO MEET THE INTENT OF CRITERION F.3, ORO PLANS/PROCEDURES SHALL:

✓ Describe the test method and period (e.g., monthly, quarterly or annually) for each communication system used for the functions identified in Criteria F.1. and F.2.

EXPLANATION

Periodic testing is conducted to ensure that emergency communications systems are available when needed.

Systems used on a routine basis, such as commercial telephones and law enforcement and fire response radio nets, do not need to be periodically tested. Periodic testing is described for systems that are used less frequently or are limited to emergency use, such as dedicated telephone circuits, emergency-only radio channels, or pagers used for personnel notification. Testing includes any associated electronic or computer equipment (e.g., fax machines, auto-dial equipment, or computers used to store phone numbers).

Minimum frequencies for testing certain communication links are described in Criterion N.2.a.

REFERENCES

- NUREG-0654/FEMA-REP-1, Revision 1, Appendix 3 – *Means for Providing Prompt Alerting and Notification of Response Organizations and the Population*, October 1980.
- *National Incident Management System*, December 2008.
- *Comprehensive Preparedness Guide 101: Developing and Maintaining State, Territorial, Tribal, and Local Government Emergency Plans*, Version 2, November 2010.

7. Planning Standard G – Public Education and Information

Information is made available to the public on a periodic basis on how they will be notified and what their initial actions should be in an emergency (e.g., listening to a local broadcast station and remaining indoors), the principal points of contact with the news media for dissemination of information during an emergency (including the physical location or locations) are established in advance, and procedures for coordinated dissemination of information to the public are established.

NUREG CRITERION G.1

Each organization shall provide a coordinated periodic (at least annually) dissemination of information to the public regarding how they will be notified and what their actions should be in an emergency. This information shall include, but not necessarily be limited to:

a. educational information on radiation;

b. contact for additional information;

c. protective measures, e.g., evacuation routes and relocation centers, sheltering, respiratory protection, radioprotective drugs; and

d. special needs of the handicapped.[30]

Means for accomplishing this dissemination may include, but are not necessarily limited to: information in the telephone book; periodic information in utility bills; postings in public areas; and publications distributed on an annual basis.

Applicability and Cross-Reference to Plans: Licensee X State X Local X

TO MEET THE INTENT OF CRITERION G.1, ORO PLANS/PROCEDURES SHALL INCLUDE:

- ✓ A description of each item (e.g., brochure, calendar, utility bill insert) used to disseminate public information annually. Copies of these items must be provided to FEMA for review on an annual basis through the ALC. In addition to the ALC submission, new public information brochures/calendars, etc. will be sent to FEMA prior to dissemination for a baseline review, and will then be submitted annually thereafter with the ALC or for review during a SAV, exercise, separate mailing, etc.
- ✓ Provisions for identifying individuals needing assistance with evacuation and how personal information will be protected.
- ✓ A description of materials directed to transient populations.
- ✓ A description of materials addressing information for the ingestion pathway, if separate from the general public information materials.
- ✓ A description of each item translated into non-English languages that are spoken within the EPZ as well as information accessible to other persons with disabilities and access/functional needs located within the EPZ.[31]

FEMA HIGHLY RECOMMENDS THAT PLANS/PROCEDURES:

- ✓ Include provisions to provide some form of public information for non-English speaking populations
- ✓ That comprise less than 5% or 10,000 persons of the voting age population.

[30] The Americans with Disabilities Act of 1990 (ADA), the Rehabilitation Act of 1973 (RA), and the Fair Housing Act (FHA), their regulations and agency guidance, as well as state counterparts, among others, define the scope of requirements for children and adults with and without access or functional needs.

[31] Refer to Executive Order 13407 (Public Alert and Warning System, June 26, 2006).

EXPLANATION

This criterion addresses the contents of written information that is distributed annually to the public in the plume EPZ. The information may take various forms including brochures (for both residents and visitors), telephone book inserts, or calendars; this can be supplemented by an Internet-based system. The licensee and OROs generally coordinate/communicate on the content and arrangements for distribution of this material.

To avoid confusing the public, it is essential that the information in distributed materials be consistent with information contained in the plans/procedures that will be used to make PADs and compose EAS messages, particularly any pre-scripted material for EAS or tone-alert radio broadcasts. These materials must be consistent with respect to:

- Descriptions and maps of protective action areas;
- Evacuation routes and relocation centers; and
- Protective measures for schools and licensed day cares.

a. Information for the General Public

The licensee and OROs must provide information annually to the general public located within the plume EPZ. All information is written in "plain language" and is clear, accurate, consistent, and complete to ensure it is easily understood by members of the public. The same "plain language" principle is applied to all information translated into non-English languages provided to the public. The information provided annually to the public includes:

- A clear statement of purpose.
- Date (year) of issue and issuing agency (ies).
- A statement instructing the recipients to keep the information.
- Detailed information on how the public in the EPZ will be notified and where to turn for emergency information and instructions. This includes call signs and frequencies or channel numbers of radio and television stations that have been designated to provide emergency instructions to the public, consistent with emergency response plans/procedures.[32]
- Information on protective actions, including:
    - Specific and logically presented instructions for actions to take when sheltering-in-place. The instructions provided must be consistent with the emergency response plans/procedures.
    - Instructions on evacuation including securing the home, a list of evacuation supplies, suggestions for notifying neighbors and friends, transportation assistance information, suggested evacuation destination including the need, if any, to report to reception or relocation centers, and clearly defined evacuation routes and written directions.
    - If State and/or Tribal governments have authorized the use of radioprotective drugs by the general public in the EPZ, information on the distribution and use of KI. However, in some cases, State and/or Tribal governments within an EPZ may have different policies and procedures for distribution and use of KI by the general public. In such cases, information provided annually by all OROs within the EPZ address all policies for the distribution and use of KI across the EPZ, noting the differences between such policies and procedures across jurisdictions.

[32] As a condition of licensing, all radio and television stations were mandated by the Federal Communications Commission (FCC) to purchase and install XC-certified equipment for implementation of the EAS by January 1, 1997. However, radio and television stations are not required to broadcast alerts and messages initiated by OROs. Under FCC authorities, the final authority for the broadcast of messages initiated by OROs resides with the broadcaster, not the ORO. The FCC, however, encourages licensees to broadcast emergency alerts as a public service. The use of emergency system broadcasting through the EAS is considered part of this service. Thus, if the EAS is used, it is critical that OROs work closely with their local broadcast industry representatives and state and local emergency Communication Committees to establish agree upon protocols to avoid problems in communicating emergency messages to the public during actual emergencies. Reference: *Guidance for Providing Emergency Information and Instructions to the Public for Radiological Emergencies Using the New Emergency Alert System (EAS)*. [Memorandum from FEMA Associate Director for Preparedness, Training, and Exercises to FEMA Regional Directors. February 2, 1999.]

- An easy-to-read EPZ map that highlights the evacuation routes and location of reception centers and other centers used for public services during an emergency (e.g., places for parents to pick up their children, locations of any facilities set up to provide care for household pets). The map must be consistent with the plans/procedures and include a simple legend and compass direction.
- Provisions for persons with disabilities and access/functional needs, including a method for individuals within the EPZ in need of assistance during an evacuation to contact authorities regarding planning for assistance in an emergency.
- Policies and provisions for service animals.
- Information consistent with the plans/procedures regarding the care of children at public and private schools and licensed day cares (child and adult), mobility- and hearing-impaired persons, and those needing transportation assistance.
- Information on the evacuation routes leading to reception/relocation centers.
- Information on other centers used for public services during an emergency, congregate care, and the services and supplies provided by those centers (e.g., information about which facilities accept household pets).
- Educational information that includes basic information on radiation, how the NPP produces electricity, and the ECLs.
- Agricultural information, if appropriate to the area, including information or instructions regarding protection of livestock and commercial agricultural or home garden products. This may include references to additional sources of information.

b. Identification of Individuals Who Need Assistance during an Evacuation

Plans/procedures describe a method for identifying individuals who need assistance when evacuating. Such individuals include those with physical or mental limitations and the transportation-dependent. For example, the material could include a card to be completed and returned to the appropriate agency by residents needing special assistance during an emergency. However, recent studies have shown that the response to self-registration cards is historically very low. OROs that use this method should consider supplemental venues for self-registration and identification of individuals.

FEMA has developed guidance to support Federal, State, local, and Tribal, governments in the integration of children and adults with and without disabilities who have access and functional needs into every aspect of emergency shelter planning and response.[33]

c. Special Information for Transient Populations

The licensee and OROs may also develop separate public information directed at transient populations. These abbreviated forms (e.g., signs, decals, notices, visitor brochures, etc.) must be consistent with the plans/procedures and contain at least the following information: 1) channels/frequencies of local EAS radio and television stations; and 2) reference to a source for further information, such as a brochure, Website or telephone book page.

[33] For additional guidance see *Guidance on Planning for Integration of Functional Needs Support Services in General Population Shelters*, Federal Emergency Management Agency, November 2010.

d. Information for the Ingestion Pathway

Materials include information on the ingestion pathway. This information is either included as a section in the annual public information materials published and distributed by the State and/or licensee or presented as fact sheets summarizing recommended protective actions for applicable agricultural industries including milk, livestock, and crops produced for human consumption. The information covers the following subjects:

- Effects of radiation and radioactive material deposits on the human food supply;
- Explanation of ORO ingestion PAGs;
- How farmers, food processors and distributors will be notified of when and which protective actions are taken in an emergency;
- Identification of sources where further information may be obtained during an emergency, such as NOAA Weather Radio and the EAS; and
- Identification of possible preventive protective actions taken for food and water, including livestock, poultry, fruits, vegetables, and other crops. Examples of preventive protective actions are:
  - Milk – Removing all lactating dairy animals from pasture and placing them on uncontaminated feed and water;
  - Vegetables and Fruits – Washing, brushing, scrubbing or peeling fruits and vegetables to remove surface contamination;
  - Meat and Meat Products – If levels of radioactive cesium in milk approach the preventive PAG "response level," surveillance and protective actions for meat are recommended (e.g., placing meat animals on uncontaminated feed and water);
  - Poultry and Poultry Products – Monitoring poultry if they are raised outdoors and especially if they are used for egg production. If poultry live indoors and are fed stored rations, contamination is unlikely;
  - Soils – If soil problems occur, proper soil management procedures could be implemented to reduce contamination: (1) Idling (i.e., non-use of the land) may be necessary in some cases; however, in a worst case situation, removal and proper disposal of soil would be more appropriate; (2) Alternating types of crops may be beneficial in some situations. Planting crops that would contribute little or no radioactive material to the human diet could be substituted for other food crops. For example, fiber crops such as cotton and flax might be substituted for fruit and vegetable crops; (3) Deep plowing may keep radioactive substances below the plant root zone where these substances can decay and (4) Liming to limit absorption of specific radioactive substances by the crops.
  - Grains – Permitting grain to grow to maturity, with subsequent milling and polishing to remove most of the radioactive contamination; and
  - Water – Covering open wells, rain barrels, and tanks to prevent contamination of water supplies. For storage containers which are supplied by runoff from roofs or other surface drain fields, the filler pipe is disconnected to prevent contaminants from being washed into the storage container. Unless soils are highly permeable, contaminants deposited on the ground will normally travel very slowly into the aquifer. In addition, radionuclides may be released directly into surface water bodies and into groundwater. Streams and lake currents can transport these radionuclides many miles in a few hours.
- Other emergency protective actions which may involve the interdiction or condemnation of foods, feeds or other contaminated products.

e. Foreign Language Translation of Public Information Materials

At a minimum, public information materials shall be translated into any non-English language spoken by more than 10,000 individuals or more than 5% of the total voting age citizens in a single political subdivision (usually a county, but a township or municipality in some States) within the EPZ[34] All translated information is clear, accurate, consistent, and complete, as appropriate, to ensure that it is easily understood by members of the public. Additionally, as appropriate, public information materials are developed for those such as the visually impaired.

As appropriate, contacts and service contracts are established to translate emergency information disseminated to the public prior to, as well as during, an emergency. Additionally, consideration is given to identifying existing local media and/or community organizations (e.g., specialized newspapers, radio or TV stations, and volunteer organizations active in disasters) that reach specific non-English-speaking audiences. These audiences may need to be targeted during awareness/preparedness campaigns.

For any non-English language that is spoken in the EPZ by less than 10,000 individuals or 5 percent of the population of voting age (based on current demographic studies), if translations of public information materials are not provided in that language, then FEMA highly recommends that OROs make other efforts to afford that population information similar to that provided to the general population within the EPZ. Such efforts might include the following activities:

- Special courses of instruction for the non-English language community leaders;
- Public meetings featuring a speaker trained in the relevant non-English language;
- Training leaders of neighborhood organizations;
- Advertisements in non-English language newspapers; and
- Providing oral assistance to individuals who lack English language proficiency through a "buddy" system.

These efforts are adapted to local circumstances to achieve the purpose of the Public Information Program: ensuring that the population within the EPZ is knowledgeable regarding how they will be alerted and provided instructions about what they are supposed to do in the event of a radiological emergency.

REFERENCES

- *Policy Statement on Respiratory Protection*, November 22, 1985.
- *National Incident Management System*, December 2008.
- Executive Order 13407, *Public Alert and Warning System*, June 26, 2006.
- *National Response Framework, Emergency Support Function #15 – External Affairs Annex*, May 2013.
- National Response Framework, Public Affairs Support Annex, May 2013.
- *Comprehensive Preparedness Guide 101: Developing and Maintaining State, Territorial, Tribal, and Local Government Emergency Plans*, Version 2, November 2010.

[34] See Part IV, Section S. Public Information Guide and Process.

NUREG CRITERION G.2

The public information program shall provide the permanent and transient adult population within the plume exposure EPZ an adequate opportunity to become aware of the information annually. The programs should include provision for written material that is likely to be available in a residence during an emergency. Updated information shall be disseminated at least annually. Signs or other measures (e.g., decals, posted notices, or other means placed in hotels, motels, gasoline stations, and phone booths) shall also be used to disseminate to any transient population within the plume exposure pathway EPZ appropriate information that would be helpful if an emergency or accident occurs. Such notices should refer the transient to the telephone directory or other source of local emergency information and guide the visitor to appropriate radio and television frequencies.

Applicability and Cross-Reference to Plans: Licensee X State X Local X

TO MEET THE INTENT OF CRITERION G.2, ORO PLANS/PROCEDURES SHALL INCLUDE:

- ✓ Methods used to disseminate public information, assuring that all residences in the plume EPZ will be covered, and that written material will likely be available in a residence during an emergency;
- ✓ Methods for distributing ingestion exposure pathway information annually within the 10-mile EPZ, and provisions for distribution within the 50-mile EPZ if needed; and
- ✓ Methods used to disseminate and maintain public information for transient populations.

EXPLANATION

This criterion pertains to the methods of dissemination of public information aimed at the permanent and transient adult populations within the plume EPZ. The distribution may take various forms including a brochure, telephone book insert, or calendar; this can be supplemented by an Internet-based system. The licensee and OROs generally coordinate/communicate on the content and arrangements for distribution of this material.

Information on the ingestion exposure pathway is disseminated at least annually to farmers, processors and distributors in the food production process located within the 10-mile EPZ. The licensee and/or OROs are prepared to disseminate information for implementing protective actions within the entire 50-mile ingestion pathway in the event of a Site Area Emergency or General Emergency.

Distribution of public information materials directed at transient populations may take various forms, including the posting of visible information (e.g., signs, decals, notices, visitor brochures, etc.) in places that are likely to be frequented by transients, such as gas stations, motels and hotels, phone booths, Automatic Teller Machines, parks and recreation areas, marinas, shopping malls, major employers, community shelters, and social service agencies. Plans/procedures include a list of the locations where information for transient populations is posted, as well as a mechanism for annual update. New signs need not be posted every year, provided none of the displayed information has changed. However, plans/procedures specify an annual procedure for: (a) determining whether any of the notices require updating; and (b) if so, replacing old materials with new. In addition, OROs annually audit locations where information is posted to determine whether it is still there and still legible, or whether it needs to be replaced.

REFERENCES

- *National Incident Management System*, December 2008.
- *National Response Framework, Emergency Support Function #15 – External Affairs Annex*, May 2013.
- *National Response Framework, Public Affairs Support Annex*, May 2013.
- *Comprehensive Preparedness Guide 101: Developing and Maintaining State, Territorial, Tribal, and Local Government Emergency Plans*, Version 2, November 2010.

NUREG CRITERION G.3.a

Each principal organization shall designate the points of contact and physical locations for use by news media during an emergency.

Applicability and Cross-Reference to Plans: Licensee X State X Local X

TO MEET THE INTENT OF CRITERION G.3.a, ORO PLANS/PROCEDURES SHALL:

- ✓ Identify the location where the jurisdiction will brief the media, whether at a Joint Information Center (JIC), separate facility, or both.
- ✓ Include a physical description of the facility, including its location and size, and any steps necessary to activate it for use (e.g., coordination with other organizations consistent with ICS, installation of equipment, and rearranging of furnishings), for jurisdictions that operate a media facility.
- ✓ If the primary facility is located within the EPZ, identify an alternate facility located outside the EPZ available to provide the same capabilities, and describe the facility with the same level of detail specified for the primary facility.
- ✓ Describe the organization's capability to answer media telephone inquiries.
- ✓ Describe the mechanism for coordination between the team of personnel designated to answer media calls and the organization's public information officer (PIO), as well as with points of contact located at other facilities supporting the JIC.

EXPLANATION

Location: during a radiological emergency, large numbers of media representatives are expected to congregate in the area seeking information about the emergency and response efforts. To minimize confusion and promote organized release of information, suitable locations for briefing the media are designated in advance. At most locations, the licensee and involved governmental jurisdictions have designated a single facility for joint use. However, contact with the media does not need to be limited to the JIC. A given jurisdiction may send a representative to the JIC and provide separate media briefings at its own facility. This criterion addresses physical requirements of a media facility, whether joint or separate.

Responsible parties: the facility description includes a statement indicating at what point in time the media facility will be activated and who, by title/position, will be responsible for staffing and operating that facility. For jurisdictions whose contact with the media is limited to a JIC operated by another organization, the plans/procedures need to identify only the JIC, the organization responsible for that facility, and the method for contacting that organization.

Telephone inquiries: in addition to face-to-face interactions, each principal organization needs the capability to respond to media inquiries over the telephone. To perform that function effectively on a large scale, a multi-line phone setup and team of personnel is designated to handle media calls. An appropriately staffed Internet-based system may be used to complement this capability.

Plans/procedures describing telephone interactions with the media include, at minimum, a telephone number that is not given out to the general public, but is designated solely for incoming media inquiries, and identify the team of personnel, by title/position, designated to answer media calls and respond to incoming inquiries. If an Internet-based system is used to complement this capability, the description also includes details of that system's capabilities.

Recommended features: certain features are recommended for supporting JIC operations. FEMA recommends that jurisdictions with limited resources that perform small-scale media functions at their own facilities (e.g., towns, small municipalities) provide these features to the extent possible given their resources. The recommended features of the JIC include:

- A briefing room to accommodate members of the media;
- Private (i.e., media-free) work areas for public information personnel;
- Effective communications systems to enable the PIOs to maintain contact with EOCs and all other relevant response locations;
- Sufficient equipment to support operations such as computers, fax machines, and copiers;
- Sufficient electrical service to support the surge in demand from computers, lights, cameras, public address systems, radio equipment, etc.;
- Office furniture, equipment, and supplies;
- Parking;
- Telephones for media use;
- Internet connectivity;
- Provision to control access to the facility (e.g., security personnel, a sign-in desk, ID badges);
- Work area for a public inquiry telephone team;
- Work area for a media inquiry telephone team; and
- A media monitoring area.

REFERENCES

- *National Incident Management System*, December 2008.
- *National Response Framework, Emergency Support Function #15 – External Affairs Annex*, May 2013.
- *National Response Framework, Public Affairs Support Annex*, May 2013.
- *Comprehensive Preparedness Guide 101: Developing and Maintaining State, Territorial, Tribal, and Local Government Emergency Plans*, Version 2, November 2010.

NUREG CRITERION G.3.b

Each licensee shall provide space that may be used for a limited number of the news media at the Emergency Operations Facility.

Applicability and Cross-Reference to Plans: Licensee _X_ State __ Local __

NUREG CRITERION G.4.a

Each principal organization shall designate a spokesperson who should have access to all necessary information.

Applicability and Cross-Reference to Plans: Licensee _X_ State _X_ Local _X_

TO MEET THE INTENT OF CRITERION G.4.a, ORO PLANS/PROCEDURES SHALL:

- ✓ Identify who, by title/position, will serve as the main PIO for the organization and where the PIO will be located. If media interaction is planned for more than one location, a main PIO is designated for each location.
- ✓ Describe how the PIO will obtain access to information about the emergency and the organizations' response efforts, gather and verify such information, and coordinate/communicate with the appropriate personnel for approval in advance of disseminating any information to the public and/or the media.

- ✓ If the PIO will be operating at a location remote from the EOC, describe:
  - Who, by title/position, will be the main point of contact in the EOC for exchanging information with the PIO; and
  - What physical means (e.g., telephone, fax, or computer network) will be used for communicating information between the EOC and the PIO.
- ✓ Include procedures for authorizing release of information and, in particular, for control and release of sensitive information.

EXPLANATION

Roles and responsibilities: to ensure that interaction with news media is effective, the role and function of the PIO (a.k.a., media director/coordinator, public affairs officer, spokesperson) is defined in advance. This element entails designating a PIO for the organization and ensuring he or she has access to the information necessary to perform the job effectively. The PIO for public entities is someone who is trained and experienced in dealing with the media. Using a specialist for this role also avoids tying up key response officials.

To perform his or her role effectively, the PIO has direct access to the latest official information concerning the emergency and response efforts. Procedures for accessing this information should be consistent with ICS. If the PIO is unable to be at or function at the planned location(s), then a mechanism is developed for forwarding key information to the PIO and allowing him or her to approach response officials for answers to specific questions in advance of releasing any information to the public and/or media.

Considerations for HAB incidents: in an HAB incident, additional governmental agencies that do not normally participate in the REP Program may become involved in the response. These agencies include the FBI, local law enforcement, and additional components of DHS. The presence of these agencies will require additional coordination and may require different procedures regarding the sharing and dissemination of public information. FBI and other law enforcement agencies responding to the hostile action may need to withhold sensitive information from public release to protect the integrity of the criminal response and evidence collection process.

To address these issues, OROs establish a process to coordinate the timely sharing and release of public information with the FBI and law enforcement during an HAB incident. Roles and responsibilities for release of public information in an HAB incident are defined in ORO plans/procedures (particularly between the FBI and response organizations, including the Incident Command). States with multiple NPPs may have to interact with multiple FBI field offices that may have different response times or different approaches to sensitive information. Guidelines may be needed to determine what is withheld for security reasons and what information is released to protect the public.

Information release procedures: all organizations establish formal control mechanisms on the release of information (e.g., use of preapproved generic press statements and a procedure requiring that information be approved by a responsible official, consistent with ICS, before being released). Such mechanisms help control the reliability and consistency of the information released. The organizations also have specific policies and procedures for controlling and releasing sensitive information (e.g., information about injuries, private information about persons with disabilities and access/functional needs, sensitive law-enforcement information). Such plans/procedures address the types of sensitive information subject to redaction, limited release, and/or withholding (e.g., certain information dealing with specific aspects of NPP security capabilities, actual or perceived adversarial/terrorist force or threat, tactical law enforcement response, and/or crime scene investigation). Preapproved generic press statements may be used to initially address media inquiries, while not identifying specifics regarding response and/or aspects of crime scene investigation.

REFERENCES

- *National Incident Management System*, December 2008.
- FEMA-517 – Basic Guidance for Public Information Officers (PIOs).

- *National Response Framework, Emergency Support Function #15 – External Affairs Annex*, May 2013.
- *National Response Framework, Public Affairs Support Annex*, May 2013.
- *Comprehensive Preparedness Guide 101: Developing and Maintaining State, Territorial, Tribal, and Local Government Emergency Plans*, Version 2, November 2010.

NUREG CRITERION G.4.b

Each organization shall establish arrangements for timely exchange of information among designated spokespersons.

Applicability and Cross-Reference to Plans: Licensee X State X Local X

TO MEET THE INTENT OF CRITERION G.4.b, ORO PLANS/PROCEDURES SHALL DESCRIBE:

- ✓ The exchange, discussion, and coordination of information among PIOs, if information is provided to the media primarily through a JIC (e.g., meetings to coordinate and share information prior to press briefings/conferences, circulation of press releases among the PIOs and their staffs);
- ✓ If the jurisdiction has a PIO at a separate facility (in addition to or instead of the JIC), equipment and procedures for timely exchange of information with other PIOs, including:
- ✓ Who, by title/position, is responsible for ensuring that the exchange takes place; and
- ✓ What physical communication means (e.g., telephone, fax, computer network, electronic mail, video, or Internet-based teleconference system) will be used.

EXPLANATION

Joint information system: a joint information system is an effective tool to achieve public information goals. A joint information system is designed to provide the necessary structure and mechanisms for organizing, developing, integrating, and delivering coordinated interagency messages; developing, recommending, and executing public information plans/procedures and strategies on behalf of senior emergency response officials; advising senior emergency response officials concerning public affairs issues that could affect a response effort; and controlling rumors and inaccurate information that could undermine public confidence in the incident response effort. The JIC is a physical facility that supports the implementation of the joint information system.

Information exchange: PIOs for different organizations and levels of government (i.e., Federal, State, local, or Tribal) need to coordinate/communicate to ensure that information disseminated to the public is accurate, consistent, timely, and easy to understand. They may exchange information verbally, either face-to-face or by telephone, video, or Internet-based teleconferences and/or by exchanging electronic or hard copies of press releases and other information. The goals of accuracy, consistency, timeliness, and accessibility are best served if PIOs exchange, discuss, and coordinate information to be disseminated to the public prior to its release.

REFERENCES

- *National Incident Management System*, December 2008.
- FEMA-517, *Basic Guidance for Public Information Officers (PIOs)*.
- *National Response Framework, Emergency Support Function #15 – External Affairs Annex*, May 2013.
- *National Response Framework, Public Affairs Support Annex*, May 2013.
- *Comprehensive Preparedness Guide 101: Developing and Maintaining State, Territorial, Tribal, and Local Government Emergency Plans*, Version 2, November 2010.

NUREG CRITERION G.4.c

Each organization shall establish coordinated arrangements for dealing with rumors.

Applicability and Cross-Reference to Plans: Licensee X State X Local X

TO MEET THE INTENT OF CRITERION G.4.c, ORO PLANS/PROCEDURES SHALL:

- ✓ Describe the capability to receive and effectively respond to numerous simultaneous telephone calls from the general public and respond to questions, requests, or comments posed by the public.
- ✓ Identify the method for publicizing the dedicated telephone number(s) and other contact information (e.g., Website address) for public inquiries and/or media information.
- ✓ Include or describe procedures to effectively monitor media information messages to identify incomplete, inaccurate, or ambiguous information related to the emergency in the public domain.
- ✓ If a jurisdiction sends a delegate to a joint public inquiry program or relies on another organization to answer public inquiries, identify which organization provides or coordinates the public inquiries program and the method for contacting that organization.

EXPLANATION

An effective public inquiry program serves two purposes, both of which are addressed by this criterion. First, it allows the public to have direct access to a knowledgeable official source for answers to their questions during a response effort. Second, it serves as a feedback mechanism that provides response officials with an indication of patterns or trends in public inquiries that may indicate the presence of unconfirmed reports, rumors, and/or incomplete, inaccurate, or ambiguous information that needs to be addressed in news releases and briefings.

The media monitoring function complements the public inquiry program to identify incomplete, inaccurate, or ambiguous information related to the emergency being disseminated the public domain.

Location: At many locations, public inquiry is conducted as a joint operation, often collocated with the JIC, or by one principal organization on behalf of all the EPZ organizations.

Activation: Plans/procedures of organizations responsible for the function of public inquiry include a statement indicating at what point in time the public inquiries center will be activated and who, by title/position, will be responsible for staffing and operating the center. Telephones and staff are designated for a public inquiries center. Internet-based discussion forums (e.g., instant messaging, blogs, and/or electronic bulletin boards) supported by designated personnel, identified by title/position, may be used to complement this capability.

Message monitoring and analysis: Plans/procedures address the methods to provide staff with current information about the emergency and response efforts in a timely manner. Staff is alert for patterns or trends in inquiries that may suggest the presence of unconfirmed reports, rumors, misinformation, or confusion, and reports such patterns or trends to the PIOs for clarification.

Plans/procedures also describe the method the PIO uses to analyze any patterns or trends reported by the public inquiry staff, as well as any incomplete, inaccurate, or ambiguous information related to the emergency identified by the media monitoring staff. Such analysis is accomplished in coordination with response officials and other PIOs, as appropriate, prior to the release of any clarifying and/or corrected information to the public and the media. The PIO promptly addresses such issues, as appropriate, in subsequent press releases and/or press briefings.

Finally, the plans/procedures discuss the method used to notify public inquiry and media monitoring staff about the release of any clarifying and/or corrected information to the public and the media.

Scope: The scope of media monitoring includes, as appropriate, print, radio, television, cable, and Internet-based media. Internet-based media (e.g., web logs or blogs) are periodically updated journals that provide online commentary with minimal to no external editing. Media institutions have adopted this format, with many television networks, newspapers, and opinion journals now hosting blogs on their Websites. PIOs need to be aware that blogs are a part of social media reporting virtually 24/7 throughout their area of responsibility.

REFERENCES

- *National Incident Management System*, December 2008.
- *National Response Framework, Emergency Support Function #15 – External Affairs Annex*, May 2013.
- *National Response Framework, Public Affairs Support Annex*, May 2013.
- *Comprehensive Preparedness Guide 101: Developing and Maintaining State, Territorial, Tribal, and Local Government Emergency Plans*, Version 2, November 2010.

NUREG CRITERION G.5

Each organization shall conduct coordinated programs at least annually to acquaint news media with the emergency plans, information concerning radiation, and points of contact for release of public information in an emergency.

Applicability and Cross-Reference to Plans: Licensee _X_ State _X_ Local _X_

TO MEET THE INTENT OF CRITERION G.5, ORO PLANS/PROCEDURES SHALL DESCRIBE:

- ✓ Provisions for an annual media briefing.
- ✓ Distribution of written materials (media kits) covering topics described below.
- ✓ Each item provided as baseline information about REP to the local media.

EXPLANATION

This criterion is intended to provide a baseline of information about REP to the local media. The purpose of this baseline is to prepare local media for their potential role as conduits of emergency information and to promote accurate, objective reporting on radiological emergencies. Furthermore, positive media relationships built during normal day-to-day activities will be valuable during an incident.

OROs hold an annual briefing, workshop, mailing, or other means of providing information to news media on the following topics:

- An overview of the joint information system and emergency plans/procedures, including organizational roles and authorities, ECLs, and protective actions.
- Points of contact and locations for release of public information during an emergency, including media center locations and alternate facilities, as well as telephone numbers for media inquiries.
- General information concerning radiation exposure and health effects, as well as the distribution and use of KI by the general public, as appropriate. Consistent with the explanation provided under Criterion G.1, information about the distribution and use of KI is included only if State and/or Tribal governments have authorized the use of radioprotective drugs by the general public in the EPZ. However, in some cases, State and/or Tribal governments within an EPZ may have different policies and procedures for distribution and use of KI by the general public. In such cases, information provided to the media by all OROs within the EPZ as part of their outreach and awareness efforts addresses all policies for the distribution and use of KI across the EPZ, noting the differences between such policies and procedures across jurisdictions.

OROs provide copies of materials used for media briefing to FEMA for review on an annual basis through the ALC. In addition to the ALC submission, materials may be reviewed during an SAV, exercise, separate mailing, etc. To avoid confusing the public, it is essential that the information provided to the local media be consistent with the information contained in plans/procedures that will be used to make PADs and compose EAS messages, particularly any pre-scripted material for EAS or tone-alert radio broadcasts.

NOTE: In instances of poor attendance, in lieu of a meeting, a statement that program materials covering requisite topics were mailed to media representatives must be provided.

REFERENCES

- *National Incident Management System*, December 2008.
- *National Response Framework, Emergency Support Function #15 – External Affairs Annex*, May 2013.
- *National Response Framework, Public Affairs Support Annex*, May 2013.
- *Comprehensive Preparedness Guide 101: Developing and Maintaining State, Territorial, Tribal, and Local Government Emergency Plans*, Version 2, November 2010.

8. Planning Standard H – Emergency Facilities and Equipment

Adequate emergency facilities and equipment to support the emergency response are provided and maintained.

NUREG CRITERION H.1

Each licensee shall establish a Technical Support Center and an onsite operations support center (assembly area) in accordance with NUREG-0696.[35]

Applicability and Cross-Reference to Plans: Licensee X State __ Local __

NUREG CRITERION H.2

Each licensee shall establish an Emergency Operations Facility from which evaluation and coordination of all licensee activities related to an emergency is to be carried out and from which the licensee shall provide information to Federal, State, and local authorities responding to radiological emergencies in accordance with NUREG-0696.[36]

Applicability and Cross-Reference to Plans: Licensee X State __ Local __

NUREG CRITERION H.3

Each organization shall establish an emergency operations center for use in directing and controlling response functions.

Applicability and Cross-Reference to Plans: Licensee __ State X Local X

TO MEET THE INTENT OF CRITERION H.3, ORO PLANS/PROCEDURES SHALL INCLUDE:

- ✓ A description of or reference to the location and layout of the EOC;
- ✓ A listing of facility equipment necessary to support operations;
- ✓ The EOC's backup power capability, if available;
- ✓ Details and methods for access control to the facility;
- ✓ Reference to the location of the alternate EOC, if applicable; and
- ✓ The organization and official, by title/position, responsible for maintaining the operational readiness of the EOC.

EXPLANATION

ORO plans/procedures include or reference the location of the EOC for directing and controlling emergency response functions. The plans/procedures also include or reference an EOC layout diagram, a list of facility equipment (e.g., telephones, displays, fax machines, computers), and the source(s) of backup power (if available at an EOC). Plans/procedures also state that access to the facility is limited to those individuals who have functional responsibilities required for EOC operations.

If there is an alternate EOC, the plans/procedures identify or reference its location and include or reference the layout diagram and the facility equipment (see Criterion F.1.b. for a discussion regarding alternate EOC communication links). It is expected that the EOC will have provisions for continuous operation in the event of a power failure, which may include alternate power sources, alternate locations, the use of a mobile command vehicle, etc. The plans/procedures identify the organization and official, by title/position, responsible for maintaining the operational readiness of the EOC.

[35] "Revision 1" was deleted: NUREG-0696 has not been revised as per NUREG-0654/FEMA-REP-1, Revision 1, *Addenda*, March 2002.

[36] "Revision 1" was deleted: NUREG-0696 has not been revised as per NUREG-0654/FEMA-REP-1, Revision 1, *Addenda*, March 2002.

REFERENCES

- *National Incident Management System*, December 2008.
- *National Response Framework*, second edition May 2013.
- *Comprehensive Preparedness Guide 101: Developing and Maintaining State, Territorial, Tribal, and Local Government Emergency Plans*, Version 2, November 2010.

NUREG CRITERION H.4

Each organization shall provide for timely activation and staffing of the facilities and centers described in the plan.

Applicability and Cross-Reference to Plans: Licensee X State X Local X

TO MEET THE INTENT OF CRITERION H.4, ORO PLANS/PROCEDURES SHALL INCLUDE:

- ✓ Detailed procedures for activation and staffing of all emergency facilities.
- ✓ Criteria used for declaring facilities operational.
- ✓ A list of staff, by title/position, assigned to each facility and rosters of key positions.

EXPLANATION

Plans/procedures describe timely activation and staffing of any facilities needed to support an emergency response and specify how these facilities would be set up. Plans/procedures address the timing of facility activation (e.g., concurrent with initial emergency personnel notification or at a specific ECL). Plans/procedures list specific criteria for declaring a facility operational. These criteria might include completion of the physical setup of the facility, the presence of specific emergency staff at the facility, setup of key communication links, or a combination of these conditions.

The plans/procedures also identify, in an appendix, staff members by title/position, assigned to each facility, rosters of key positions (i.e., those essential to support EOC operations), and the number of personnel needed to support operations in each role or position. Plans/procedures also contain information on methods for alerting emergency staff.

REFERENCES

- *National Incident Management System*, December 2008.
- *National Response Framework*, second edition May 2013.
- *Comprehensive Preparedness Guide 101: Developing and Maintaining State, Territorial, Tribal, and Local Government Emergency Plans*, Version 2, November 2010.

NUREG CRITERION H.5

Each licensee shall identify and establish onsite monitoring systems that are to be used to initiate emergency measures in accordance with [NUREG-0654/FEMA-REP-1] Appendix 1, as well as those to be used for conducting assessment.

The equipment shall include:

a. geophysical phenomena monitors (e.g., meteorological, hydrologic, seismic);

b. radiological monitors (e.g., process, area, emergency, effluent, wound and portable monitors and sampling equipment);

c. process monitors (e.g., reactor coolant system pressure and temperature, containment pressure and temperature, liquid levels, flow rates, status or lineup of equipment components); and

d. fire and combustion products detectors.

Applicability and Cross-Reference to Plans: Licensee _X_ State __ Local __

NUREG CRITERION H.6

Each licensee shall make provision to acquire data from or for emergency access to offsite monitoring and analysis equipment, including:

a. geophysical phenomena monitors (e.g., meteorological, hydrologic, seismic);

b. radiological monitors, including rate meters and sampling devices (Dosimetry shall be provided and shall meet, as a minimum, the NRC Radiological Assessment Branch Technical Position for the Environmental Radiological Monitoring Program); and

c. laboratory facilities, fixed or mobile.

Applicability and Cross-Reference to Plans: Licensee _X_ State __ Local __

NUREG CRITERION H.7

Each organization, where appropriate, shall provide for offsite radiological monitoring equipment in the vicinity of the nuclear facility.

Applicability and Cross-Reference to Plans: Licensee _X_ State _X_ Local _X_

TO MEET THE INTENT OF CRITERION H.7, ORO PLANS/PROCEDURES SHALL DESCRIBE:

- ✓ Radiological monitoring equipment, by type and number, that is located or stored near the NPP or that will be brought in by the ORO; and
- ✓ Fixed radiological monitoring stations near the NPP.

EXPLANATION

Plans/procedures identify any offsite radiological monitoring equipment that is located or stored near the NPP (e.g., at staging areas, ICPs, the EOF) and monitoring equipment to be brought to the vicinity by the ORO. The plans/procedures include written descriptions of the types and quantities of equipment available at each location. If there are radiation detectors, permanent record dosimeters, and/or air sampling pumps at fixed stations located near the NPP, the plans/procedures identify them as potential resources and include written descriptions and maps of the fixed stations.

REFERENCES

- *National Incident Management System*, December 2008.
- *National Response Framework, Nuclear/Radiological Incident Annex*, June 2008.
- *Comprehensive Preparedness Guide 101: Developing and Maintaining State, Territorial, Tribal, and Local Government Emergency Plans*, Version 2, November 2010.

NUREG CRITERION H.8

Each licensee shall provide meteorological instrumentation and procedures that satisfy the criteria in [NUREG-0654/FEMA-REP-1] Appendix 2 and provisions to obtain representative current meteorological information from other sources.

Applicability and Cross-Reference to Plans: Licensee X State ___ Local ___

NUREG CRITERION H.9

Each licensee shall provide for an onsite operations support center (assembly area) that shall have adequate capacity and supplies, including, for example, respiratory protection, protective clothing, portable lighting, portable radiation monitoring equipment, cameras, and communications equipment for personnel present in the assembly area.

Applicability and Cross-Reference to Plans: Licensee X State ___ Local ___

NUREG CRITERION H.10

Each organization shall make provisions to inspect, inventory, and operationally check emergency equipment/instruments at least once each calendar quarter and after each use. There shall be sufficient reserves of instruments/equipment to replace those that are removed from emergency kits for calibration or repair. Calibration of equipment shall be at intervals recommended by the supplier of the equipment.

Applicability and Cross-Reference to Plans: Licensee X State X Local X

TO MEET THE INTENT OF CRITERION H.10, ORO PLANS/PROCEDURES SHALL DESCRIBE:

- ✓ The organization(s) responsible for maintenance of all radiological equipment; and
- ✓ Specifics regarding the inventory, operational checks, and calibration for dosimetry, portal monitors, radiological survey equipment, air sampling equipment, and laboratory equipment.

EXPLANATION

Plans/procedures identify the organization(s) responsible for maintaining radiological equipment, including inventory, inspections, calibration, and operational checks. Plans/procedures include provisions to ensure sufficient equipment for all emergency workers responding to an incident at an NPP. The plans/procedures discuss the following equipment types, as appropriate.

a. Dosimetry

Dosimeters are available in two basic types: permanent record dosimeters (PRDs) (e.g., film badges and thermoluminescent dosimeters [TLDs], which have to be read by a laboratory) and direct-reading dosimeters (DRDs) (e.g., ion chamber electroscope and electronic dosimeters, which can be read by the user) (see Evaluation Criterion K.3.a for more detail).

The plans/procedures identify the dosimetry, including DRDs and PRDs, used by emergency workers and include quantities of items required, based on the number of emergency workers; quantities of equipment available, by type and model; and information regarding backup equipment (i.e., how many items are available by type/model and where they are stored). Also, if dosimetry will be provided from remote locations, the plans/procedures describe methods for obtaining the dosimetry, including what organization will supply the equipment, how much is available, and its estimated arrival time.

Plans/procedures include instructions for checking DRDs before operation. Emergency workers check dosimeters for initial readings and re-zero them, if necessary. Plans/procedures include information about PRDs, including where the PRDs would be turned in for processing and instructions for handling and storing control badges. Plans/procedures address the methods

and frequency for inspection of DRDs (i.e., checks for electrical leakage and calibration). New types of dosimeters (e.g., electronic) may be used as long as recommended manufacturers' instructions are followed.

b. Portal Monitors

If portal monitors are used, the plans/procedures provide inventory information, including equipment models, types, quantities, and locations. The plans/procedures also include information on backup equipment (i.e., how many items are available by type/model and where they are stored) as well as backup electrical power for portal monitors without an independent backup supply.

Plans/procedures discuss instructions for operational checks of portal monitors including the frequency and method used for such checks (e.g., electrical operational check and radioactive check source). OROs complete portal monitor operational checks prior to initial use in the field and before operation in accordance with guidance in *Contamination Monitoring Standard for a Portal Monitor Used for Emergency Response*, FEMA-REP-21 (March 1995). The plans/procedures indicate that each monitor will be labeled with the date of the last operational check and date of the next calibration. Calibration is at intervals recommended by the manufacturer of the equipment.

c. Radiological Survey Instruments

Plans/procedures provide separate lists of the radiological survey instruments used by field monitoring teams (FMTs) and those used by emergency workers at reception centers. The equipment lists include quantities of instruments required, based on the number of FMTs and reception center requirements, and quantities available by model. The plans/procedures identify backup equipment, including how many items are available by type/model and where they are stored.

Plans/procedures discuss instructions for operational checks of radiological survey instruments, including the frequency and method used for such checks (e.g., battery checks and radioactive source checks). OROs complete operational checks on a quarterly basis and before deployment into the field. Instruments being used to measure activity have accompanying documentation and/or a sticker affixed to the instrument indicating the effective range of readings. The range of readings documentation indicates the acceptable range of readings that the meter should indicate when it is response-checked using a standard test source. The plans/procedures also address the frequency of instrument calibration; calibrations are performed at least annually unless otherwise specified by the manufacturer.

d. Air Sampling Equipment

The plans/procedures include an inventory of air sampling equipment, with model types, numbers, and storage location for each organization(s) responsible for air sampling. The plans/procedures identify backup equipment (i.e., how much is available and where it is stored) Plans/procedures also identify the source of power needed to drive the equipment.

Plans/procedures discuss methods for operational checks of air sampling equipment. OROs complete operational checks quarterly and before FMTs are deployed. The plans/procedures also provide for calibrating air sampling equipment at least annually.

e. Laboratory Equipment

The plans/procedures include inventory information on laboratory equipment (e.g., gamma spectrum, liquid scintillation) for each organization(s) responsible for laboratory analysis. If backup equipment is provided by another laboratory, the plans/procedures include the name of the laboratory and provide a summary of its capabilities. The plans/procedures discuss methods and frequency of calibration for all types of laboratory equipment being used.

REFERENCES

- FEMA-REP-2, Rev. 2, *Guidance on Offsite Emergency Radiation Measurement Systems, Phase 1 – Airborne Release*, June 1990.
- FEMA-REP-21, *Contamination Monitoring Standard for a Portal Monitor Used for Radiological Emergency Response*, March 1995.
- FEMA-REP-22, *Contamination Monitoring Guidance for Portable Instruments Used for Radiological Emergency Response to Nuclear Power Plant Accidents*, October 2002.
- *National Incident Management System*, December 2008.
- *Comprehensive Preparedness Guide 101: Developing and Maintaining State, Territorial, Tribal, and Local Government Emergency Plans*, Version 2, November 2010.

NUREG CRITERION H.11

Each plan shall, in an appendix, include identification of emergency kits by general category (protective equipment, communications equipment, radiological monitoring equipment, and emergency supplies).

Applicability and Cross-Reference to Plans: Licensee X State X Local X

TO MEET THE INTENT OF CRITERION H.11, ORO PLANS/PROCEDURES SHALL DESCRIBE:

- ✓ The number and contents of emergency kits by location and general category; and
- ✓ The quantity of each item per kit.

EXPLANATION

The plans/procedures identify sufficient supplies of emergency equipment by category of kit and quantity of each item per kit. Protective equipment refers essentially to clothing (e.g., booties, gloves, coveralls, rain suits, helmets). Communications equipment includes hand-held/field radios, cellular telephones, and any communications equipment essential for field operations. Radiological monitoring equipment includes the equipment discussed in Criterion I.8. Emergency supplies include any type of equipment that might be necessary for emergency response (e.g., barricades, plastic cones, flashlights).

REFERENCES

- *National Incident Management System*, December 2008.
- *Comprehensive Preparedness Guide 101: Developing and Maintaining State, Territorial, Tribal, and Local Government Emergency Plans*, Version 2, November 2010.

NUREG CRITERION H.12

Each organization shall establish a central point (preferably associated with the licensee's Emergency Operations Facility), for receipt and analysis of all field monitoring data and coordination of sample media.

Applicability and Cross-Reference to Plans: Licensee X State X Local X

TO MEET THE INTENT OF CRITERION H.12, ORO PLANS/PROCEDURES SHALL DESCRIBE:

- ✓ The organization(s) responsible for assessing radiological data;
- ✓ The location of the central point for compiling and analyzing all field monitoring data, including the means used by FMTs to relay information to the central point; and
- ✓ The coordination and analysis of sample media, including procedures for transporting samples and transferring the data from the laboratory to the central point.

EXPLANATION

Plans/procedures identify the organization(s) responsible for assessing radiological data, the central point for compiling and analyzing all field monitoring data, methods used by FMTs to relay information to the central point, and the means by which it is processed (e.g., computer model).

Plans/procedures also address coordination and analysis of sample media and describe methods for transporting samples, including identification of: (1) laboratories involved, (2) predetermined transfer points, if used, and (3) the individual, by title/position, responsible for deciding which samples are sent to which laboratory. The plans/procedures also describe the methods for analyzing the data and transferring the data from the laboratory to the central point. If a privately owned lab is used, an LOA is necessary.

REFERENCES

- FEMA-REP-2, Rev. 2, *Guidance on Offsite Emergency Radiation Measurement Systems, Phase 1 – Airborne Release*, June 1990.
- *National Response Framework, Nuclear/Radiological Incident Annex*, June 2008.

9. Planning Standard I – Accident Assessment

Adequate methods, systems, and equipment for assessing and monitoring actual or potential offsite consequences of a radiological emergency condition are in use.

NUREG CRITERION I.1

Each licensee shall identify plant system and effluent parameter values characteristic of a spectrum of off-normal conditions and accidents and shall identify the plant parameter values or other information that correspond to the example initiating conditions of [NUREG-0654/FEMA-REP-1] Appendix 1. Such parameter values and the corresponding emergency class shall be included in the appropriate facility emergency procedures. Facility emergency procedures shall specify the kinds of instruments being used and their capabilities.

Applicability and Cross-Reference to Plans: Licensee _X_ State __ Local __

NUREG CRITERION I.2

Onsite capability and resources to provide initial values and continuing assessment throughout the course of an accident shall include post-accident sampling capability, radiation and effluent monitors, in-plant iodine instrumentation, and containment radiation monitoring in accordance with NUREG-0737[37] as elaborated in the NRC letter to all power reactor licensees dated October 30, 1979.

Applicability and Cross-Reference to Plans: Licensee _X_ State __ Local __

NUREG CRITERION I.3

Each Licensee shall establish methods and techniques to be used for determining:

a. the source term of releases of radioactive material within plant systems (An example is the relationship between the containment radiation monitor[s] reading[s] and radioactive material available for release from containment); and

b. the magnitude of the release of radioactive materials based on plant system parameters and effluent monitors.

Applicability and Cross-Reference to Plans: Licensee _X_ State __ Local __

NUREG CRITERION I.4

Each licensee shall establish the relationship between effluent monitor readings and onsite and offsite exposures and contamination for various meteorological conditions.

Applicability and Cross-Reference to Plans: Licensee _X_ State __ Local __

[37] NUREG-0737, Clarifications of TMI Action Plan Requirements, November 1980, and Requirements for Emergency Response Capability, NUREG-0737, Supplement 1, January 1983, superseded the original reference to NUREG-0578 per NUREG-0654/FEMA-REP-1, Revision 1, *Addenda*, March 2002.

NUREG CRITERION I.5

Each licensee shall have the capability of acquiring and evaluating meteorological information sufficient to meet the criteria of [NUREG-0654/FEMA-REP-1] Appendix 2. There shall be provisions for access to meteorological information by at least the near-site Emergency Operations Facility, the Technical Support Center, the Control Room and an offsite NRC center. The licensee shall make available to the State suitable meteorological data processing interconnections which will permit independent analysis by the State, of facility generated data in those States with the resources to effectively use this information.

Applicability and Cross-Reference to Plans: Licensee X State __ Local __

NUREG CRITERION I.6

Each licensee shall establish the methodology for determining the release rate/projected doses if the instrumentation used for assessment is off-scale or inoperable.

Applicability and Cross-Reference to Plans: Licensee X State __ Local __

NUREG CRITERION I.7

Each organization shall describe the capability and resources for field monitoring within the plume exposure Emergency Planning Zone that are an intrinsic part of the concept of operations for the facility.

Applicability and Cross-Reference to Plans: Licensee X State X Local X

TO MEET THE INTENT OF CRITERION I.7, THE ORO PLANS/PROCEDURES SHALL DESCRIBE:

- ✓ Which organizations have primary responsibility for field monitoring activities; and
- ✓ The capabilities and resources State, local, Tribal, and non-governmental organizations will contribute.

EXPLANATION

The plans/procedures identify the organizations that will contribute to the field monitoring effort. This information includes the number of FMTs per shift and specific functions of each FMT (e.g., ambient monitoring or field sampling). The plans/procedures identify arrangements for the timely exchange of field measurement data and coordination of monitoring activities. If non-governmental (e.g., licensee, university, contractor, mutual-aid) FMT resources are used, LOAs need to be established, as referenced in Criterion A.3. The plans/procedures and LOAs clearly delineate activities performed by these non-governmental FMTs, such as collection of air samples within the plume and determination of the airborne radioiodine concentrations present.

REFERENCES

- FEMA-REP-2, Revision. 2, *Guidance on Offsite Emergency Radiation Measurement Systems, Phase 1 – Airborne Release*, June 1990.
- *National Incident Management System*, December 2008.
- *Comprehensive Preparedness Guide 101: Developing and Maintaining State, Territorial, Tribal, and Local Government Emergency Plans*, Version 2, November 2010.

NUREG CRITERION I.8

Each organization, where appropriate, shall provide methods, equipment, and expertise to make rapid assessments of the actual or potential magnitude and locations of any radiological hazards through liquid or gaseous release pathways. This shall include activation, notification means, field team composition, transportation, communication, monitoring equipment, and estimated deployment times.

Applicability and Cross-Reference to Plans: Licensee X State X Local X

TO MEET THE INTENT OF CRITERION I.8, ORO PLANS/PROCEDURES SHALL DESCRIBE:

- ✓ The process for activating and notifying field teams;
- ✓ The composition of the FMTs (e.g., organizations involved, number of teams [two or more], number of members on each team);
- ✓ The types and sources of transportation resource(s) for FMTs and estimated deployment times to reach a site from various locations, if applicable;
- ✓ The location of any staging areas;
- ✓ The title/position of the person responsible for directing FMTs to proper locations for monitoring and air sampling;
- ✓ The monitoring, sampling, and communications equipment that will be used by FMTs;
- ✓ The procedures that will be followed for field monitoring, sample collection, and field sample analysis;
- ✓ The laboratories to which specific samples will be sent for analysis, including estimated delivery and analysis times, transportation and temporary storage arrangements, and procedures for chain-of-custody records; and
- ✓ How the ORO will obtain centerline measurements.

EXPLANATION

a. Activation and Notification

The plans/procedures describe the activation processes for FMTs (two or more), including identifying the organization(s) and individual(s), by title/position, that will receive the initial information. Plans/procedures also specify the designated ECL at which the FMTs will be mobilized or deployed. FMTs may be activated at a different time than EOCs.

The plans/procedures specify the means of notification (e.g., pager or telephone calls), the individual, by title/position, responsible for contacting personnel, the notification process (e.g., telephone tree or multiline automatic ring-down system), and a list of personnel, including alternates, to be contacted for FMT activities. The plans/procedures indicate whether repeat attempts will be made to reach those who do not initially respond or whether alternates will be used.

b. Field Team Composition

The plans/procedures identify how many teams will be deployed for field monitoring and sampling (two or more) and describe their compositions (e.g., a health physicist or health physics technician and a driver who is a nontechnical local person familiar with the area). The plans/procedures provide LOAs for FMTs that are composed of a mixture of government representatives and non-governmental resources such as licensee or private representatives (e.g., university, contractor, or mutual-aid).

c. Transportation

The plans/procedures identify types and sources of transportation provided for the FMTs. Means of transportation is appropriate for the assignment to be carried out (e.g., four-wheel drive vehicles or boats where needed to reach monitoring or sampling locations) and is large enough to carry all supplies, equipment, and personnel required to support the field monitoring operation.

d. Estimated Deployment Times

The plans/procedures identify the time it takes the activated teams to prepare and leave the point of origin. FEMA recommends that plans/procedures include the estimated time of arrival at the monitoring locations. The plans/procedures also identify any staging areas near each reactor site that will be used as initial deployment points for the teams.

e. Communications

The plans/procedures indicate what equipment (e.g., radios and cellular telephones) the FMTs will use to communicate with their base, with each other, and with FMT support personnel (e.g., sample couriers). The plans/procedures also address how communication would be accomplished if the primary communication system were to fail.

f. Direction of Field Teams

The plans/procedures identify how the FMTs will be directed and coordinated, including identifying the individual, by title/position, responsible for coordination and where this individual will be located. The sampling strategy is a condition of the emergency, thus, the plans/procedures specify the decision-making process for placement and movement of FMTs, including procedures for determining the locations, within the plume pathway, suitable for collecting air samples via open- and closed-window ambient exposure rate measurements. ORO teams obtain peak plume measurements (centerline measurements) according to their plans/procedures. FMTs may accomplish this by traversing the plume to obtain peak plume measurements (centerline measurements), or by making mathematical calculations from measurements taken off centerline, as agreed in plans/procedures or LOAs. FMTs will obtain plume-edge measurements. In addition, the plans/procedures address whether FMTs coordinate/communicate with other FMTs in the field (e.g., Federal, ORO, or licensee) and how they share duties, resources, and measurement data.

The plans/procedures include locations of any predetermined field monitoring points and instructions on the use of ad hoc monitoring points during an incident. The plans/procedures also address how the FMTs will be directed to those points (e.g., use of familiar landmarks or global positioning system [GPS] equipment).

g. Field Monitoring Equipment

The plans/procedures contain lists of monitoring and sampling equipment to be used by the FMTs, including the following:

(1) Ambient Monitoring Equipment

- Low-Range Survey Meters – capable of making both gamma and beta-plus-gamma readings; the upper limit of the gamma range is in the tens of mR/hr.
- High-Range Survey Meters – overlaps the low range instrument and has an upper limit of the gamma range capable of measuring the exposure rate limit defined in the plans/procedures. If no exposure rate limit is defined, an instrument capable of measuring in the tens of R/hr is generally adequate.

(2) Air Sampling Equipment

- Air Sampler – calibrated to flow rate and capable of being powered by the transportation vehicle or other portable electrical source. The air sampler is capable of providing a sampling flow rate compatible with the type of adsorbent cartridge being used, typically 2 cubic feet per minute (cfm) or 5 cfm, depending on adsorbent cartridge geometry.
- Cartridges – silver zeolite, silver alumina, or silver silica gel.
- Particulate Filters – high-efficiency particulate air (HEPA) or equivalent.
- Counting Equipment – count rate meter or scaler capable of processing data from a suitable radiation detection probe. Probe selection will depend on adsorbent geometry.
- Miscellaneous Supplies – tweezers, plastic bags, gloves, markers, labels, etc.

(3) Environmental Media Sampling Equipment

- Collection Equipment – shovel or trowel, shears or other cutting devices, bucket or bottles for liquid samples, and distance measuring device.
- Monitoring Instrument – μR meter and/or count rate meter with thin-window Geiger-Mueller (G-M) probe.
- Miscellaneous Supplies – plastic bags, gloves, shoe covers, markers, labels, etc.

h. Field Team Procedures

The plans/procedures describe the methods for monitoring, collecting, and analyzing samples, including the following.

(1) Equipment Checks

Prior to using an instrument(s) for monitoring, the FMT members verify that calibration stickers are current and then check the instrument(s) for proper operation. This would involve checking the battery and, for a low-range instrument, measuring the radiation from an accompanying check source. Operational checks are conducted according to the procedures and guidance in the explanation under Criterion H.10. The results of this check-source measurement are compared to the proper reading for the source, as stated on the calibration label.

(2) Communication Protocols

The plans/procedures emphasize the need for clear communication of the units used for measured values and the time, place, and person making the measurements.

(3) Ambient Radiation Measurements

The procedures state that open- and closed-window readings are taken at waist level (approximately 1 meter) or higher and at near-ground levels (e.g., 5-7 centimeters). When conducting open-window readings, it is recommended that the beta window on the instrument's probe point up for waist level or higher readings and down for near-ground readings. Taking multiple readings helps identify changes in the plume.

(4) Air Sampling Procedures

If the radiological release is a particulate release, the procedures indicate that the number of air samples required may be increased to clearly define the particulate distribution within the plume. For example:

- Sampling Locations – The procedures stipulate how to choose a suitable location(s) to collect an air sample. Some of the air samples would preferably be collected near a peak exposure rate reading acquired while traversing the plume. Additional samples are taken at other locations, including areas near the plume edge. In the case of no release, several locations may be used to confirm the absence of a release.
- Monitoring – Waist level or higher ambient radiation readings are taken at the beginning, middle, and end of the sampling period.
- Flow Rate – The flow rate and total volume collected are appropriate to allow the collection and analytical system to assure capability to detect 10-7 microcuries per cubic centimeter (mCi/cc) of radioiodine.
- Cartridge/Filter – The type of cartridge and particulate filter used are noted.
- Counting – Counting procedures for field measurements are noted, such as:
  - Traveling to a low background area;
  - Obtaining gross count or using a single-channel analyzer;
  - Counting the cartridge and particle filter; and
  - Using reproducible geometry when measurements are taken.

- Bagging/Labeling – Methods are described for bagging and labeling samples, including the information that will be provided on the label (e.g., location, time, date, sample or ambient exposure rate, name of collector). The plan/procedures also include instructions for a chain-of-custody form.
- Transfer – The plan/procedures include the method for transferring and dispatching samples to the laboratory for isotopic analysis of particulates and for radionuclides, especially if only gross measurements were taken on the cartridge.

(5) Environmental Sampling Procedures

Procedures for collecting samples to support both ingestion and relocation decisions describe the following:

- The media to be sampled;
- Methods for obtaining samples (e.g., tools to use, size of the sampling area, weight or volume of samples collected);
- Methods for bagging and labeling samples, including a chain-of-custody form;
- Information to be included on labels;
- Methods for determining sampling locations (e.g., exposure rates); and
- Methods to prevent cross-contamination.

(6) Other Information

Other information collected on samples taken to support the relocation decision includes the following:

- Size of the area from which the sample was taken and procedures for selecting sampling locations (e.g., exposure rates);
- Transfer and dispatch of samples to the laboratory; and
- Ambient radiation exposure rate, which is taken for each sample and recorded on its label.

i. Laboratories

The plans/procedures indicate the laboratory(ies) to which specific samples will be sent. The capability of each laboratory to analyze various radioisotopes is addressed in Criterion C.3. In addition, the procedures describe the arrangements for transporting samples and temporary storage of samples when needed. The plans/procedures clearly identify the estimated times required to transport collected air samples to the designated laboratory(ies), perform the required analyses, and transmit the results to the appropriate locations (e.g., dose assessment group). Transportation of plume phase samples to the laboratory or other facility for analysis must be completed expeditiously due to decay of short lived radionuclides. If sample counting is not performed immediately in the field, which is preferred, samples will be transferred to the laboratory within four hours. Finally, the procedures indicate the capability to ensure the security and integrity of collected samples through documentation and maintenance, such as chain-of-custody forms.

Fixed laboratories or (if available) mobile laboratories can be used in lieu of portable instruments for the FMT to perform an early assessment, provided that: (1) the laboratory is equipped with appropriate counting equipment and (2) the laboratory is able to provide analysis of air samples for airborne radioiodine and particulates in a time comparable to the FMT. If applicable, plans/procedures indicate the placement of mobile laboratories at predesignated staging areas. In addition, if the plans/procedures state that an additional private laboratory(ies) will be used in support of the State in sample analysis or that the licensee's laboratory will be used, appropriate LOAs are referenced in the plans/procedures, as described in Criterion A.3.

j. Radiological Exposure Control

The plans/procedures identify the requirements for FMT members' radiological exposure control (see Planning Standard K).

REFERENCES

- FEMA-REP-2, Revision 2, *Guidance on Offsite Emergency Radiation Measurement Systems, Phase 1 – Airborne Release*, June 1990.
- FEMA-REP-12, *Guidance on Offsite Emergency Radiation Measurement Systems, Phase 2 – The Milk Pathway*, September 1987.
- FEMA-REP-13, *Guidance on Offsite Emergency Radiation Measurement Systems, Phase 3 – Water and Non-Dairy Food Pathway*, May 1990.
- EPA-400-R-92-001, *Manual of Protective Action Guides and Protective Actions for Nuclear Incidents*, May 1992.
- Federal Register, Volume 63, No. 156, pp.43402-43403, *Accidental Radioactive Contamination of Human Food and Animal Feeds: Recommendations for State and Local Agencies, Food and Drug Administration*, August 13, 1998.
- *National Incident Management System*, December 2008.
- *Comprehensive Preparedness Guide 101: Developing and Maintaining State, Territorial, Tribal, and Local Government Emergency Plans*, Version 2, November 2010.

NUREG CRITERION I.9

Each organization shall have a capability to detect and measure radioiodine concentrations in air in the plume exposure EPZ as low as 10^{-7} µCi/cc (microcuries per cubic centimeter) under field conditions. Interference from the presence of noble gas and background radiation shall not decrease the stated minimum detectable activity.

Applicability and Cross-Reference to Plans: Licensee X State X Local X

TO MEET THE INTENT OF CRITERION I.9, ORO PLANS/PROCEDURES SHALL DESCRIBE:

- ✓ The capability to collect air samples within the plume and perform analysis that will detect radioiodine concentrations as low as 10^{7} µCi/cc under field conditions; and
- ✓ The process used for collecting air samples, including location of sampling points, timing of sample collection, and techniques used to collect and count (see Criterion I.8).

EXPLANATION

Early determination of the potential thyroid dose will be needed. An activity level of about 10^{7} µCi/cc of radioiodine is required to make a thyroid dose calculation. Some procedures call for the FMTs to make this measurement using portable instrumentation. The procedures allow for collection of sufficient quantities of radioiodine in a reasonable sampling time to permit field measurement in the presence of noble gases. Those organizations that deploy mobile laboratories can use them to measure the radioiodine concentrations; nonetheless, they still need to maintain the ability to use portable detection equipment to meet this standard. The plans/procedures also state that interference from noble gas and background radiation does not decrease the stated minimum detectable activity. See Criterion I.8 for field monitoring and sampling procedures and equipment.

REFERENCE:

- FEMA-REP-2, Revision 2, *Guidance on Offsite Emergency Radiation Measurement Systems, Phase 1 – Airborne Release*, June 1990.

NUREG CRITERION I.10

Each organization shall establish means for relating the various measured parameters (e.g., contamination levels, water, and air activity levels) to dose rates for key isotopes (i.e., those given in [NUREG-0654/FEMA-REP-1] Table 3, page 18) and gross radioactivity measurements. Provisions shall be made for estimating integrated dose from the projected and actual dose rates and for comparing these estimates with the protective action guides.[38] The detailed provisions shall be described in separate procedures.

Applicability and Cross-Reference to Plans: Licensee X State X Local __

TO MEET THE INTENT OF CRITERION I.10, ORO PLANS/PROCEDURES SHALL ADDRESS THE FOLLOWING POINTS FOR THE EARLY, INTERMEDIATE, AND LATE PHASES:

- ✓ Personnel and equipment that will be involved in dose assessment;
- ✓ Computer software and documentation, including data input procedures, that will be used;
- ✓ Alternate methods that may be used (e.g., hand calculations);
- ✓ Information/variables to run the model, including proper units of measure;
- ✓ Means for obtaining initial information (e.g., from licensee monitors or inventory estimates);
- ✓ Use of field data to verify and modify model results; and
- ✓ Procedures for comparing dose results with those of other organizations that perform dose assessments.

EXPLANATION

The plans/procedures for the State (and for local governments, if applicable) describe the methods to estimate actual or potential doses to the public in terms that may be compared with both the EPA-400 PAGs and FDA derived intervention levels (DILs). The plans/procedures also identify that there are three phases: early (plume activities), intermediate (ingestion/relocation activities), and late (return/recovery activities).

REFERENCES

- NUREG-0654/FEMA-REP-1, Revision 1, Table 3, page 18, October 1980.
- FEMA-REP-2, Revision 2, *Guidance on Offsite Emergency Radiation Measurement Systems, Phase 1 – Airborne Release*, June 1990.
- FEMA-REP-12, *Guidance on Offsite Emergency Radiation Measurement Systems, Phase 2 – The Milk Pathway*, September 1987.
- FEMA-REP-13, *Guidance on Offsite Emergency Radiation Measurement Systems, Phase 3 – Water and Non-Dairy Food Pathway*, May 1990.
- EPA-400-R-92-001, *Manual of Protective Action Guides and Protective Actions for Nuclear Incidents*, May 1992.
- Federal Register, Volume 63, No. 156, pp.43402-43403, *Accidental Radioactive Contamination of Human Food and Animal Feeds: Recommendations for State and Local Agencies, Food and Drug Administration*, August 13, 1998.

[38] The FDA revised guidance refers to DILs.

NUREG CRITERION I.11

Arrangements to locate and track the airborne radioactive plume shall be made, using either or both Federal and State resources.

Applicability and Cross-Reference to Plans: Licensee __ State X Local __

TO MEET THE INTENT OF CRITERION I.11, ORO PLANS/PROCEDURES SHALL DESCRIBE:

- ✓ The planned use of any outside resources to locate and track the plume, including taking measurements and collecting air samples from or near the plume's peak concentration, if applicable.

EXPLANATION

Criterion I.8 requires detailed description of FMT procedures for plume monitoring. If the State plans to track and define only the outer edges of the plume, plans/procedures reference arrangements for the use of outside resources to take measurements and collect air samples from peak exposure rate areas near the plume's peak concentration. For example, organizations may rely on Federal, licensee or other (e.g., university, contractor, mutual-aid) FMT data. These arrangements are established in LOAs, as appropriate.

REFERENCES

- FEMA-REP-2, Revision 2, *Guidance on Offsite Emergency Radiation Measurement Systems, Phase 1 – Airborne Release*, June 1990.
- *National Response Framework, Nuclear/Radiological Incident Annex*, June 2008.

10. Planning Standard J – Protective Response

A range of protective actions have been developed for the plume exposure pathway EPZ for emergency workers and the public. In developing this range of actions, consideration has been given to evacuation, sheltering, and as a supplement to these, the prophylactic use of potassium iodide (KI), as appropriate.[39] Evacuation time estimates have been developed by applicants and licensees and must be updated on a periodic basis.[40] Guidelines for the choice of protective actions during an emergency, consistent with Federal guidance, are developed and in place, and protective actions for the ingestion exposure pathway EPZ appropriate to the locale have been developed.

NUREG CRITERION J.1

Each licensee shall establish the means and time required to warn or advise onsite individuals and individuals who may be in areas controlled by the operator, including:

a. Employees not having emergency assignments;

b. Visitors;

c. Contractor and construction personnel; and

d. Other persons who may be in the public access areas on or passing through the site or within the owner-controlled area.

Applicability and Cross-Reference to Plans: Licensee X State __ Local __

NUREG CRITERION J.2

Each licensee shall make provisions for evacuation routes and transportation for onsite individuals to some suitable offsite location, including alternatives for inclement weather, high traffic density, and specific radiological conditions.

Applicability and Cross-Reference to Plans: Licensee X State X Local X

TO MEET THE INTENT OF CRITERION J.2, ORO PLANS/PROCEDURES SHALL DESCRIBE:

- ✓ Assistance that will be provided to licensees during an evacuation of the site or a statement that no assistance is required;
- ✓ The alternatives that will be implemented during inclement weather and/or high traffic densities; and
- ✓ Provisions for coordinating arrangements with other offsite organizations to expedite evacuation of onsite personnel.

EXPLANATION

The plans/procedures describe how OROs (e.g., State, local, or Tribal police) will provide assistance to licensees in managing the flow of traffic from the NPP in cases where the licensee evacuates non-essential onsite personnel. These procedures take into account conditions such as inclement weather, high traffic density, and/or threat conditions. Plans/procedures also describe provisions for coordinating arrangements with other offsite organizations to expedite the evacuation of onsite personnel.

REFERENCES

- *National Incident Management System*, December 2008.
- *Comprehensive Preparedness Guide 101: Developing and Maintaining State, Territorial, Tribal, and Local Government Emergency Plans*, Version 2, November 2010.

[39] Sentence added per NUREG-0654/FEMA-REP-1, Revision 1, *Addenda*, March 2002.

[40] Sentence added per NRC rule revision, 2011.

NUREG CRITERION J.3

Each licensee shall provide for radiological monitoring of people evacuated from the site.

Applicability and Cross-Reference to Plans: Licensee _X_ State __ Local __

NUREG CRITERION J.4

Each licensee shall provide for the evacuation of onsite non-essential personnel in the event of a Site or General Emergency and shall provide a decontamination capability at or near the monitoring point specified in J.3.

Applicability and Cross-Reference to Plans: Licensee _X_ State __ Local __

NUREG CRITERION J.5

Each licensee shall provide for a capability to account for all individuals onsite at the time of the emergency and ascertain the names of missing individuals within 30 minutes of the start of an emergency and account for all onsite individuals continuously thereafter.

Applicability and Cross-Reference to Plans: Licensee _X_ State __ Local __

NUREG CRITERION J.6

Each licensee shall, for individuals remaining or arriving onsite during the emergency, make provisions for:

a. Individual respiratory protection;

b. Use of protective clothing; and

c. Use of radioprotective drugs (e.g., individual thyroid protection).

Applicability and Cross-Reference to Plans: Licensee _X_ State __ Local __

NOTE: Although this criterion is the responsibility of the licensee, OROs that expect to provide onsite support in an emergency should be aware of the licensee's arrangements regarding provision of additional protective equipment and radioprotective drugs.

NUREG CRITERION J.7

Each licensee shall establish a mechanism for recommending protective actions to the appropriate State and local authorities. These shall include Emergency Action Levels corresponding to projected dose to the population-at-risk, in accordance with [NUREG-0654/FEMA-REP-1] Appendix 1 and with the recommendations set forth in Tables 2.1 and 2.2 of the Manual of Protective Actions for Nuclear Incidents (EPA-400-R-92-001).[41] As specified in NUREG-0654/FEMA-REP-1] Appendix 1, prompt notification shall be made directly to the offsite authorities responsible for implementing protective measures within the plume exposure pathway Emergency Planning Zone.

Applicability and Cross-Reference to Plans: Licensee _X_ State __ Local __

[41] Original reference to EPA-520/1-75-001 replaced with EPA-400-R-92-001 per NUREG-0654/FEMA-REP-1, Revision 1, *Addenda*, March 2002.

NUREG CRITERION J.8

Each licensee's plan shall contain time estimates for evacuation within the plume exposure EPZ. These shall be in accordance with [NUREG-0654/FEMA-REP-1] Appendix 4.

Applicability and Cross-Reference to Plans: Licensee X State __ Local __

NUREG CRITERION J.9

Each State and local organization shall establish a capability for implementing protective measures on the basis of Protective Action Guides and other criteria. This shall be consistent with the recommendations of the EPA regarding exposure resulting from passage of radioactive airborne plumes, (EPA-400-R-92-001)[42] and with those of DHEW (HHS)/FDA regarding radioactive contamination of human food and animal feeds as published in the Federal Register of August 13, 1998 (63 FR 43402[43]).

Applicability and Cross-Reference to Plans: Licensee __ State X Local X

TO MEET THE INTENT OF CRITERION J.9, ORO PLANS/PROCEDURES SHALL INCLUDE:

- ✓ The organization's procedures for making PADs and implementing protective actions based upon PAGs that are consistent with EPA recommendations; and
- ✓ The process followed to ensure coordination of PADs with all appropriate jurisdictions.

EXPLANATION

The plans/procedures describe the process and timeframe for making and implementing initial PADs on the basis of licensee notification of plant status, licensee PARs, and input from appropriate ORO authorities. The plans/procedures also describe the capability to respond to a rapidly escalating incident and contain predetermined PADs to protect the public in these situations.[44] The plans/procedures may allow for precautionary evacuation of persons with disabilities and access/functional needs if the OROs choose to do so and include precautionary or protective actions for schools, hospitals/medical facilities, nursing homes, and other facilities if the ORO decision-makers elect this option.

a. Protective Action Guides

The plans/procedures include the PAGs; these may be expressed as a range as stated in EPA 400-R-92-001, and the capability to determine the PAG value appropriate for the incident. Usually, it is appropriate to evacuate areas where doses are projected to exceed 1 rem total effective dose equivalent (TEDE) or 5 rem committed dose equivalent thyroid, the lower end of the PAG range (1-5 rem or 5-25 rem), except for incidents that involve a high-risk environment or high-risk groups (e.g., mobility-impaired). In these cases, the plans/procedures provide for flexibility where doses up to the upper end of the PAG range may be the preferred decision criterion.

Since the EPA performed risk evaluations during the development of the PAGs, it is not normally necessary to calculate the risk trade-offs among evacuation, sheltering, and radiation dose during an emergency response. For areas not being recommended for evacuation, ORO plans/procedures include instructions for the public to stay indoors and await additional instructions in areas downwind of the EPZ at distances beyond the areas designated for evacuation. The decision

[42] Original reference to EPA-520/1-75-001 replaced with EPA-400-R-92-001 per NUREG-0654/FEMA-REP-1, Revision 1, *Addenda*, March 2002.

[43] Original reference to 43 FR 58790 (December 15, 1978) replaced by the Department of Health and Human Services (HHS) and the Food and Drug Administration (FDA) guidance, *Guidance on Accidental Radioactive Contamination of Human Food and Animal Feeds, Recommendations for state and Local Agencies*, (August 13, 1998) (63 FR 43402) per NUREG-0654/FEMA-REP-1, Revision 1, Addenda, March 2002.

[44] Updated FEMA and NRC guidance in NUREG-0654/FEMA-REP-1, Revision 1, Supplement 3, *Guidance for Protective Action Strategies*, 2011, provides a protective action logic development tool that should be used by licensees to develop site-specific protective action recommendation procedures and is recommended for use by OROs to develop protective action strategy guidance for decision makers.

to substitute shelter for evacuation at projected doses up to 5 rem TEDE is based upon whether the risk of evacuation is significantly higher than normal. Sheltering, rather than evacuation, should be chosen in any incident where sheltering would provide overall greater protection, provided that adequate information is available to make this judgment. For further guidance, see NUREG-0654/FEMA-REP-1, Revision 1, Supplement 3, *Guidance for Protective Action Strategies*, October 2011.

b. Protective Action Decision Making

For an incident involving actual or significant potential for offsite consequences, it may be appropriate to immediately take protective actions (e.g., evacuation or sheltering), without waiting for release rate information or environmental measurements. Weather conditions, the direction of the plume, an HAB incident, or other circumstances may pose an undue risk to evacuation. The decision process takes into account the onsite officials' uncertainty on plant conditions and uncertainty or unfavorable prognosis of events controlling the incident. In some situations, sheltering may be the preferred protective action. For supplementary guidance on the development of predetermined PADs that take into account multiple variables, see NUREG-0654/FEMA-REP-1, Revision 1, Supplement 3, *Guidance for Protective Action Strategies*, October 2011.

In an HAB incident, the protective action decision-making process is complicated by the potential risks posed by the hostile activities themselves (i.e., more harm could be caused to individuals being evacuated if they are being moved into or through an area affected by a terrorist threat or act or an evacuation may disrupt the efforts to respond to a hostile action). Actions taken by the Incident Commander, such as closing major roadways or implementing a precautionary evacuation or sheltering close to the NPP site, may also significantly impact protective action considerations.

To account for these potential risks, PADs are closely coordinated/communicated between appropriate ORO decision-makers, and include consideration of the risk of evacuation against the risk of sheltering in place. If the decision is to evacuate some or all of the population in the EPZ, ORO decision-makers plan for contingencies that would minimize congestion caused by emergency workers entering the area at the same time that the public is evacuating.

The plans/procedures may call for joint decision-making with other jurisdictions. In such cases, the plans/procedures describe the process for communicating/coordinating with all affected jurisdictions to arrive at mutually acceptable PADs. If joint decision-making is not required, the plans/procedures describe the capability to communicate the essential contents of PADs to all affected jurisdictions.

c. Subsequent Protective Action Decisions

After initial PADs have been made and additional information becomes available regarding potential or actual releases, the dose assessment group may provide additional PARs based on dose projections. When field monitoring data become available, they are used as a basis for making decisions concerning protection of the public in additional locations. In general, protective actions that have been implemented should not be reversed based on revised dose assessments or early field measurements.

d. Protective Action Decisions for the Ingestion Exposure Pathway

In addition, the plans/procedures identify the protective actions and radiation dose or concentration levels that will be used in making decisions about the ingestion exposure pathway. If doses other than those recommended by HHS and FDA guidance are adopted by OROs, the plans/procedures provide an adequate justification for not following the FDA guidance. The approach adopted by the FDA uses DILs (derived intervention levels), measured concentrations of specific radionuclides in foods in lieu of the PAGs. In order to characterize the extent of the problem, many laboratory analyses may be required. The plans/procedures specify the actions that will be taken prior to the determination of the actual levels of contamination in the food produced in the impacted area.

REFERENCES

- *National Incident Management System*, December 2008.
- *National Response Framework, Nuclear/Radiological Incident Annex*, June 2008.

- *Comprehensive Preparedness Guide 101: Developing and Maintaining State, Territorial, Tribal, and Local Government Emergency Plans*, Version 2, November 2010.
- EPA 400-R-92-001, *The Manual of Protective Action Guides and Protective Actions for Nuclear Incidents*, May 1992.
- Federal Register, Volume 63, No. 156, pp.43402-43403, *Accidental Radioactive Contamination of Human Food and Animal Feeds: Recommendations for State and Local Agencies, Food and Drug Administration*, August 13, 1998.
- NUREG-0654/FEMA-REP-1, Revision 1, Supplement 3, *Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants – Guidance for Protective Action Strategies*, October 2011.

NUREG CRITERION J.10

The organization's plans to implement protective measures for the plume exposure pathway shall include the following:

NUREG CRITERION J.10.a

Maps showing evacuation routes, evacuation areas, pre-selected radiological sampling and monitoring points, relocation centers in host areas, and shelter areas (identification of radiological sampling and monitoring points shall include the designators in [NUREG-0654/FEMA-REP-1] Table J1 or an equivalent uniform system described in the plan);

Applicability and Cross-Reference to Plans: Licensee X State X Local X

TO MEET THE INTENT OF CRITERION J.10.a, ORO PLANS/PROCEDURES SHALL:

- ✓ Include clearly legible maps of all evacuation routes, evacuation areas, preselected radiological sampling and monitoring points (including water supplies), reception and congregate care centers in host/support jurisdictions, decontamination facilities, and shelter areas; and
- ✓ Describe the procedures and organization(s) responsible for updating and maintaining maps, as necessary, using the most current and accurate data (e.g., census data, State and county records, etc).

EXPLANATION

The plans/procedures contain, possibly in a separate appendix, clear, legible maps and displays showing features or landmarks important to emergency response during the early phase of the emergency. Approved geographic information systems data and products, as outlined by plans/procedures, may be used. Examples of map data include the plume exposure pathway EPZ and its various sectors and planning areas (may be referred to as Emergency Response Planning Areas); roads; streams; towns; evacuation routes; reception and congregate care centers; decontamination facilities; special facilities; and radiological monitoring points. The plans/procedures describe the procedure for updating maps, as necessary, and identify the organization(s) responsible for map maintenance. The maps are updated using the most current and accurate data (e.g., census data, State and county records, etc.).

REFERENCES

- NUREG-0654/FEMA-REP-1, Revision 1, Table J-1, page 62, October 1980.
- FEMA GM-21, Revision 1, *Acceptance Criteria for Evacuation Plans*, February 29, 1984.
- *National Incident Management System*, December 2008.
- *Comprehensive Preparedness Guide 101: Developing and Maintaining State, Territorial, Tribal, and Local Government Emergency Plans*, Version 2, November 2010.

NUREG CRITERION J.10.b

Maps showing population distribution around the nuclear facility. This shall be by evacuation areas[45] (licensees shall also present the information in a sector format);

Applicability and Cross-Reference to Plans: Licensee X State X Local X

TO MEET THE INTENT OF CRITERION J.10.b, ORO PLANS/PROCEDURES SHALL INCLUDE:

✓ Clear, legible maps showing population distribution around the NPP, possibly in a separate appendix.

EXPLANATION

ORO maps of population distribution are by planning areas. Approved geographic information system data and products, as outlined by plans/procedures, may be used. These maps also identify school populations, including licensed day cares and other agencies and organizations that provide FNSS, or provide reference to where the information may be found, and include the maximum anticipated population at recreation areas.

REFERENCES

- FEMA GM-21, Revision 1, *Acceptance Criteria for Evacuation Plans*, February 29, 1984.
- *National Incident Management System*, December 2008.
- *Comprehensive Preparedness Guide 101: Developing and Maintaining State, Territorial, Tribal, and Local Government Emergency Plans*, Version 2, November 2010.

NUREG CRITERION J.10.c

Means for notifying all segments of the transient and resident population;

Applicability and Cross-Reference to Plans: Licensee X State X Local X

TO MEET THE INTENT OF CRITERION J.10.c, ORO PLANS/PROCEDURES SHALL:

✓ Meet the requirements listed under Criteria E.5, E.6, and E.7

EXPLANATION

Specifics regarding means for notifying all segments of the transient and resident population are discussed in Criteria E.5, E.6, and E.7. Refer to these criteria for detailed guidance.

REFERENCES

- *National Incident Management System*, December 2008.
- *Comprehensive Preparedness Guide 101: Developing and Maintaining State, Territorial, Tribal, and Local Government Emergency Plans*, Version 2, November 2010.

[45] The term "evacuation areas" used in this criterion corresponds to the term "planning areas" used throughout this document.

NUREG CRITERION J.10.d

Means for protecting those persons whose mobility may be impaired due to such factors as institutional or other confinement;

Applicability and Cross-Reference to Plans: Licensee __ State X Local X

TO MEET THE INTENT OF CRITERION J.10.d, ORO PLANS/PROCEDURES SHALL:

- ✓ Describe the means to protect those persons whose mobility may be impaired because of institutional or other confinement (e.g., children in schools and licensed day cares and persons in nursing homes, hospitals, and correctional facilities).
- ✓ Describe the methods for determining the number of persons who may need assistance and the type of assistance, per planning area.
- ✓ Reference lists of documented individuals who need assistance in an evacuation of the EPZ and processes for keeping the lists up to date.
- ✓ Describe processes for evacuating persons with disabilities and access/functional needs and for sheltering in place those who cannot be moved.
- ✓ Describe any special transportation needs for these groups and the transportation resources, including types and quantities of vehicles, used to move them.

EXPLANATION

There are multiple subsets of persons whose mobility may be impaired during evacuations that are addressed in ORO plans/procedures.

a. Schools

The plans/procedures identify schools (i.e., public and private, kindergartens, preschools, and licensed day cares) within the plume exposure EPZ, as well as the persons responsible for planning and implementing protective actions for them. The plans/procedures stipulate that OROs, as appropriate, will take the initiative to identify and contact all schools within the plume EPZ to ensure that officials have plans/procedures in place for protecting the health and safety of the children under their care. Protective action options in the plans/procedures include provisions for notifying parents and guardians of the status and location of their children during a radiological emergency.

The licensing of day cares by governmental organizations places them under government regulation and standards. The licensing standards establish the legal responsibilities of the managers of the centers for the care, health, and safety of persons under their care, both for routine and emergency situations. In some States, certain types of day care facilities are exempt from licensing requirements (e.g., if the day care is located within the physical structure of a religious building or under a certain size). Exempt facilities are considered part of the general population for planning purposes.

For *schools*, plans/procedures include:

- Identification of the organization and officials responsible for both planning and implementing the protective actions;
- Institution-specific information (e.g., name and location, type of institution and age grouping, total population, means for implementing protective actions, transportation resources, name and location of relocation centers and, if applicable, host schools and the methods for contacting the relocation centers and host schools);
- Time frames for implementing protective actions; and

- Means for alerting and notifying schools, including:
  - Identification of the organization responsible for providing emergency information to the schools;
  - Methods (e.g., siren or telephone calls) for contacting and providing the emergency information to school officials;
  - Methods (e.g., tone alert radios or telephone calls) for contacting and activating designated transportation resources (e.g., dispatchers or school bus drivers); and
  - Methods (e.g., EAS messages or special news broadcasts) for notifying parents and guardians of the status and location of their children.

b. Health Care Facilities

The plans/procedures describe the means of evacuating patients in hospitals, nursing homes, and other healthcare facilities, and the actions required to protect those patients who cannot be relocated out of the hazard area.

The plans/procedures should have some form of communication protocol in place so that the evacuation of all types of healthcare facilities can avoid traversing the plume. However, if traversing the plume is unable to be avoided, then the transport should go to a reception center for monitoring and, if necessary, decontamination prior to transporting patients to the receiving facility or the receiving facility should have plans in place to monitor and, if necessary, decontaminate the patients it receives.

The Joint Commission requires hospitals to have plans to provide for radioactive isolation and decontamination. Additionally, Occupational Safety Health Act (OSHA) published "Best Practices for Hospital-Based First Receivers of Victims from Mass-Casualty Incidents", which outlines industry-recognized best practices for monitoring and decontamination for hazards including radioactive contamination. Since these other agencies place requirements on hospitals to prepare for contaminated patients, the REP Program has no need to evaluate these facilities, nor does the ORO have the responsibility to provide training or dosimetry.

c. Documented Individuals Who Need Assistance in an Evacuation

The plans/procedures provide for a means of protecting all categories of individuals needing assistance during an evacuation present in the EPZ. These persons may include, but are not limited to, residents with disabilities, access or functional needs, or those who may live in a facility such as an assisted living community or skilled nursing home, children and adults whose mobility is impaired due to institutional or other confinement, and the transportation-dependent. For each resident needing assistance during an evacuation, plans/procedures include or reference contacts to provide communication and physical assistance, as well as agreements with transportation providers. For those individuals requiring the assistance of service animals, the plans/procedures also include provisions for the animals' protection and accommodation. Agreements are made with hospitals/medical facilities, mental hospitals, adult care facilities, and community mental health centers outside the EPZ to receive the severely mobility-impaired and emotionally disabled.

For documented individuals who need assistance in an evacuation, ORO plans/procedures include:

- Reference to a list of all individuals within the EPZ needing assistance during an evacuation and the process for keeping the list current (e.g., working with those organizations that provide assistance to individuals who may need special assistance in an evacuation). This list is maintained at the local risk government EOC and may be included by reference.
- Means to protect those persons whose mobility may be impaired because of institutional or other confinement, including those who cannot be evacuated and must be sheltered. A means of informing these individuals of planned emergency procedures is addressed.
- An up-to-date estimate of transportation needs and list of potential resources, including types and quantities, to move the mobility impaired.

d. Correctional Facilities

The plans/procedures identify correctional facilities located in the plume EPZ and the persons responsible for planning and implementing protective actions for the correctional facility populations. Planned protective actions are also described.

REFERENCES

- The Joint Commission: Hospital, Emergency Management Chapter, Standard EM.02.02.05, July 2012.
- Occupational Safety Health Act (OSHA), "Best Practices for Hospital-Based First Receivers of Victims from Mass-Casualty Incidents", January 2005.
- *National Response Framework, Mass Evacuation Incident Annex*, June 2008.
- *Comprehensive Preparedness Guide 101: Developing and Maintaining State, Territorial, Tribal, and Local Government Emergency Plans*, Version 2, November 2010.
- Pub.L. 109-295, October 4, 2006.

NUREG CRITERION J.10.e

Provisions for the use of radioprotective drugs, particularly for emergency workers and institutionalized persons within the plume exposure EPZ whose immediate evacuation may be infeasible or very difficult, including quantities, storage, and means of distribution;[46]

Applicability and Cross-Reference to Plans: Licensee __ State X Local X

TO MEET THE INTENT OF J.10.e, ORO PLANS/PROCEDURES SHALL DESCRIBE:

- ✓ What groups might be advised to take KI;
- ✓ Adequate supply of radioprotective drugs for each individual, including quantities, storage locations, and means of distribution;
- ✓ Adequate maintenance, shelf life extensions, and timely replacement of radioprotective drugs; and
- ✓ Means for communicating a recommendation to take radioprotective drugs to emergency workers, institutionalized persons, and (if included as an option in the plans/procedures) the general public.

EXPLANATION

The plans/procedures describe the jurisdiction's policies on the use of radioprotective drugs, including what groups might be advised to use KI, how the decision to use KI would be made, and how KI would be implemented. This criterion focuses on implementation of KI use, including maintenance of KI supplies, distribution, and record keeping. Criterion J.10.f. focuses on the decision-making processes leading to KI use.

The plans/procedures identify what groups might be instructed or advised to use KI, including emergency workers, particular institutions within the plume EPZ whose populations could not be evacuated quickly, and, if applicable, the general population. In planning for the use of KI by institutionalized populations, such as hospital/medical facility patients, OROs also consider provisions for the use of KI by the institutional staff that will care for them. OROs plan for and maintain an adequate supply for each individual,[47] and plans/procedures identify quantities, storage locations, and means of distribution. For those emergency response organizations that do not routinely distribute KI to emergency workers, but

[46] The NRC has ruled that the use of KI for the general public be considered during the planning process according to *Consideration of Potassium Iodide in Emergency Plans, Final Rule*, 66 FR 5427, (January 19, 2001).

[47] For additional guidance, see *Distribution and Administration of Potassium Iodide in the Event of a Nuclear Incident, Board on Radiation Effects Research*, National Research Council of the National Academies, 2004.

rather distribute KI based on incident and release characteristics, the plans/procedures clearly identify the method and time required to complete the distribution. The plans/procedures also identify how recommendations to take the drugs will be communicated to emergency workers and institutionalized persons. The plans/procedures include the forms used for documenting ingestion of radioprotective drugs, as well as information regarding emergency workers and others who have declined the use of KI in advance. OROs document procedures for maintaining a radioprotective drug supply, including acceptable storage conditions, obtaining shelf life extensions, and replacement.

The plans/procedures include a statement that the manufacturer's instructions will be provided with KI.[48] Those organizations that have chosen to acquire KI for use by the general public must incorporate distribution procedures into the plans/procedures within 1 year of receiving the KI.

REFERENCES

- Federal Register, Vol. 67, No. 7, pp.1355-1357, *Federal Policy on Use of Potassium Iodide (KI)*, Federal Emergency Management Agency, January 10, 2002.
- Policy Paper: Federal Emergency Management Agency's Radiological Emergency Preparedness Program Guidance to States and Local Governments for Shelf Life Extension of Potassium Iodide (KI), April 12, 2007.
- EPA-400-R-92-001, *Manual of Protective Action Guides and Protective Actions for Nuclear Incidents*, May 1992.
- Federal Register Volume 66, No. 13, pp. 5427-5440, *Consideration of Potassium Iodide in Emergency Plans, Final Rule*, Nuclear Regulatory Commission, January 19, 2001.
- Federal Register, Volume 66, No. 238, pp.64046-64047, *Guidance on Use of Potassium Iodide as a Thyroid Blocking Agent in Radiation Emergencies*, Food and Drug Administration, December 11, 2001.
- *Distribution and Administration of Potassium Iodide in the Event of a Nuclear Incident, Board on Radiation Effects Research*, National Research Council of the National Academies, 2004.
- *Comprehensive Preparedness Guide 101: Developing and Maintaining State, Territorial, Tribal, and Local Government Emergency Plans*, Version 2, November 2010.

NUREG CRITERION J.10.f

State and local organizations' plans should include the method by which decisions by the State Health Department for administering radioprotective drugs to the general population are made during an emergency and the predetermined conditions under which such drugs may be used by offsite emergency workers;[49]

Applicability and Cross-Reference to Plans: Licensee __ State X Local X

TO MEET THE INTENT OF CRITERION J.10.f, ORO PLANS/PROCEDURES SHALL:

- ✓ Identify, by title/position, those who will make decisions regarding the use of KI during an emergency.
- ✓ Describe the criteria and decision-making processes for recommending the use of KI.

EXPLANATION

The plans/procedures identify the decision-makers, by title/position, and describe the decision-making processes used by the State health department or appropriate government agencies for recommending administration of radioprotective drugs, such as KI, during an emergency. The plans/procedures describe the criteria for determining whether KI is administered, including criteria for emergency workers, institutionalized persons, and the general population, if applicable.

[48] Manufacturer's patient information is available on the "Drugs@FDA" Approved Drug Products database website at http://www.accessdata.fda.gov/scripts/cder/drugsatfda/.

[49] See FDA *Federal Register* notice 66 FR 64046 *Potassium Iodide as a Thyroid Blocking Agent in a Radiation Emergency* December 11, 2001. The FDA document replaces the original footnote reference to DHEW document 43 FR 58798 per NUREG-0654/FEMA-REP-1, Revision 1, *Addenda*, dated March 2002.

Guidance on the criteria for decisions to administer KI varies. EPA 400-R-92-001 recommends a projected dose of 25 rem committed dose equivalent thyroid as warranting KI for the general public if administration of KI is included in the plans/procedures. For emergency workers, EPA 400-R-92-001 recommends KI if atmospheric releases include radioiodine. The most recent guidance issued by the FDA, *Potassium Iodide as a Thyroid Blocking Agent in a Radiation Emergency*, (66 FR 64046, December 11, 2001) discusses the administration of KI if the projected dose to the thyroid exceeds 5 rem, without regard to the population group. The documents leave the decision on conditions that warrant administration of KI to State medical officials. FDA guidance describes varying levels of projected doses, depending on age of the recipient, that warrant the use of KI.

REFERENCES

- Federal Register, Vol. 67, No. 7, pp.1355-1357, *Federal Policy on Use of Potassium Iodide (KI)*, Federal Emergency Management Agency, January 10, 2002.
- EPA-400-R-92-001, *Manual of Protective Action Guides and Protective Actions for Nuclear Incidents*, May 1992.
- Federal Register, Volume 66, No. 238, pp.64046-64047, *Guidance on Use of Potassium Iodide as a Thyroid Blocking Agent in Radiation Emergencies*, Food and Drug Administration, December 11, 2001.
- *Comprehensive Preparedness Guide 101: Developing and Maintaining State, Territorial, Tribal, and Local Government Emergency Plans*, Version 2, November 2010.

NUREG CRITERION J.10.g

Means of relocation;[50]

Applicability and Cross-Reference to Plans: Licensee __ State X Local X

TO MEET THE INTENT OF CRITERION J.10.g, ORO PLANS/PROCEDURES SHALL DESCRIBE HOW THE PUBLIC WITHIN THE PLUME EXPOSURE PATHWAY EPZ WILL BE EVACUATED, INCLUDING:

- ✓ Means for controlling traffic to assure a safe and efficient evacuation;
- ✓ Procedures for implementing alternate evacuation routes, if warranted;
- ✓ Transportation resources, including drivers;
- ✓ The methods for determining the number of persons without private transportation, per planning area; and
- ✓ Designated pickup points for persons without private transportation.

EXPLANATION

The plans/procedures identify how the general public within the 10-mile EPZ will be evacuated if necessary. This includes individuals who are capable of using public transportation; the evacuation of individuals who need special assistance in an evacuation due to physical or mental disability or institutional or other confinement is addressed in Criterion J.10.d. The plans/procedures include measures to promote smooth flow of evacuation traffic and assist persons who have no means of transportation.

Measures to promote smooth flow of evacuation traffic include designation of evacuation routes and establishment of traffic control points (TCPs) along these routes, as necessary. OROs identify personnel and equipment for traffic control. In some cases, plans/procedures may call for converting two-way roads to one-way in order to increase their traffic capacity. During HAB incidents, OROs may need to use alternate evacuation routes to avoid areas of hostile activity or to facilitate in-bound response.

The process for assisting persons without transportation include: (1) determining transportation resources, (2) determining the number of persons who may need assistance per planning area, and (3) designating pickup points for individuals

[50] In current terminology, this refers to "evacuation." Relocation is a non-urgent action during the post-emergency phase.

without transportation. This criterion does not include transportation of the mobility-impaired; see Criterion J.10.d. for this discussion. The plans/procedures provide, in a separate appendix or in appropriate sections, any LOAs that have been established to obtain these resources, as described in Criterion A.3.

REFERENCES

- *National Incident Management System*, December 2008.
- *National Response Framework, Mass Evacuation Incident Annex*, June 2008.
- *Comprehensive Preparedness Guide 101: Developing and Maintaining State, Territorial, Tribal, and Local Government Emergency Plans*, Version 2, November 2010.

NUREG CRITERION J.10.h

Relocation centers in host areas which are at least 5 miles, and preferably 10 miles, beyond the boundaries of the plume exposure emergency planning zone (see [NUREG-0654/FEMA-REP-1 Criterion] J.12);

Applicability and Cross-Reference to Plans: Licensee __ State X Local X

TO MEET THE INTENT OF CRITERION J.10.h, ORO PLANS/PROCEDURES SHALL IDENTIFY:

- ✓ All relocation centers and host schools for evacuees and students by name and address;
- ✓ Organizations responsible for managing the centers and staffing requirements for each center;
- ✓ Arrangements for handling students at relocation centers and/or host schools;
- ✓ Arrangements for handling service animals;
- ✓ Hospitals, correctional facilities, and nursing homes that will receive evacuees;
- ✓ Provisions for the radiological monitoring of evacuees, service animals, and evacuee vehicles, according to the plans/procedures (If students are taken to host schools where monitoring capabilities are not present, the plans/procedures address any special considerations for radiological monitoring of student evacuees following a release.); and
- ✓ Provisions for students at schools outside the EPZ who reside within the EPZ.

EXPLANATION

The plans/procedures identify relocation centers in host/support jurisdictions. These centers are located at least 5 miles and preferably 10 miles beyond the boundaries of the plume exposure pathway EPZ. The plans/procedures provide information on all relocation centers, including name, specific location (e.g., address, city), capacity, organization managing the center, and accessibility to persons with disabilities and access/functional needs, including those persons requiring the assistance of service animals. The plans/procedures also identify how evacuee vehicles will be handled at reception centers. Additionally, the plans/procedures address the LOAs that have been established with all resources and facilities, either in a separate appendix or in appropriate sections, as described in Criterion A.3.

The plans/procedures also identify, if possible, which schools will be directed to which relocation centers and/or host schools (located beyond the plume exposure pathway EPZ boundary). The plans/procedures describe arrangements for handling the students, including the initial assignment of students to specific areas within the centers, as well as the arrangements for the pickup of students by parents or guardians. The plans/procedures identify any hospitals, correctional facilities, and nursing homes that will receive evacuees.

The plans/procedures also describe the process for the radiological monitoring of evacuees and service animals sent to these facilities.

Some evacuees may need congregate care after arriving at a relocation center. Current FEMA policy requires that the planning basis for monitoring personnel and equipment needs be 20 percent of the EPZ population (See Criterion J.12). OROs should plan for a sufficient number of congregate care centers in host/support jurisdictions based on their all-hazard sheltering experience and what is historically relevant for that particular area. While the actual proportion of individuals seeking congregate care could be more or less than 20 percent, it is prudent to incorporate a planning basis that can be modified as the incident warrants.

FEMA developed *Guidance for Planning for Integration of Functional Needs Support Services in General Population Shelters* to support Federal, State, local, and tribal governments with the integration of children and adults with and without disabilities who have access and functional needs into every aspect of emergency shelter planning and response. Communities can use this document in conjunction with a general population shelter Standard Operating Procedure (SOP) to ensure that all shelter residents benefit equally from programs, services, and activities. The REP Program will not be evaluating FNSS compliance.

REFERENCES

- Pub.L. 109-295, October 4, 2006.

NUREG CRITERION J.10.i

Projected traffic capacities of evacuation routes under emergency conditions;

Applicability and Cross-Reference to Plans: Licensee __ State X Local X

TO MEET THE INTENT OF CRITERION J.10.i, ORO PLANS/PROCEDURES SHALL:

- ✓ Reference the evacuation time estimate (ETE) studies and include the results of the ETEs.
- ✓ Reference the traffic capacities of the evacuation routes.
- ✓ Discuss the potential need to use alternate routes because of traffic impediments, adverse weather conditions, an airborne radioactive plume, areas affected by hostile actions, or other factors that might hinder a timely, safe evacuation.
- ✓ Provide maps as described in Criterion J.10.a.

EXPLANATION

The licensee is responsible for conducting and updating the ETE; review of ETE studies is generally performed by transportation experts contracted by the NRC. OROs use ETE information to plan for evacuation. Population and roadway capacity, the primary elements in the ETE, are periodically evaluated and updated to determine if there is an impact on the ETE. The population review not only addresses increases in population, but also assesses the age demographics and persons with disabilities and access/functional needs as well. The roadway capacity assessment includes review of transportation improvements, constraints, traffic flow, and changes in transient traffic flow through the EPZ.

Licensees update the ETE in accordance with current NRC guidance. As a general rule, the ETE is revised every 10 years following the U.S. census. In addition, an ETE update must be performed at any time during the decennial period if the EPZ permanent resident population estimate increases such that it causes the longest ETE value for the 2-mile or 5-mile zone, including affected emergency response planning areas, or for the entire 10-mile EPZ to change by 25 percent or 30 minutes, whichever is less, from the licensee's currently approved ETE.

REFERENCES

- NUREG/CR7002, *Criteria for Development of Evacuation Time Estimate Studies.*
- *National Incident Management System*, December 2008.
- *National Response Framework, Mass Evacuation Incident Annex*, June 2008.
- *Comprehensive Preparedness Guide 101: Developing and Maintaining State, Territorial, Tribal, and Local Government Emergency Plans*, Version 2, November 2010.

NUREG CRITERION J.10.j

Control of access to evacuated areas and organization responsibilities for such control;

Applicability and Cross-Reference to Plans: Licensee __ State X Local X

TO MEET THE INTENT OF CRITERION J.10.j, ORO PLANS/PROCEDURES SHALL DESCRIBE:

- ✓ Procedures for controlling road access to sheltered and/or evacuated areas, including organization(s) responsible for staffing TCPs and Access Control Points (ACPs);
- ✓ Maps identifying TCPs/ACPs (may be incorporated by reference);
- ✓ Equipment and resources needed (e.g., cones or barricades);
- ✓ Procedures and responsibilities for controlling access via other transportation modes;
- ✓ Procedures and responsibilities for controlling ingress and egress to other areas affected by an incident; and
- ✓ Procedures for providing TCP/ACP staff with the status of emergency response activities.

EXPLANATION

The plans/procedures identify the various transportation modes (e.g., air, rail, water, and highway) in the plume EPZ and the organization(s) responsible for controlling each mode. Plans/procedures identify the means for controlling access to sheltered and/or evacuated areas and other areas affected by an incident. OROs describe roles and responsibilities for TCP and ACP personnel, including procedures for verifying emergency worker identification and authorizing access to the affected areas. The plans/procedures include or reference maps identifying the locations of TCPs and ACPs. The plans/procedures contain information relevant to TCP/ACP setup and implementation, including equipment and resources (e.g., cones and barricades). The plans/procedures also include contingency measures if it becomes necessary to have additional staff and/or equipment available for traffic and access control. In addition, the plans/procedures address the means and frequencies for providing TCP/ACP staff with the status of emergency response activities.

REFERENCES

- NUREG/CR7002, *Criteria for Development of Evacuation Time Estimate Studies.*
- *National Incident Management System*, December 2008.
- *National Response Framework, Mass Evacuation Incident Annex*, June 2008.
- *Comprehensive Preparedness Guide 101: Developing and Maintaining State, Territorial, Tribal, and Local Government Emergency Plans*, Version 2, November 2010.

NUREG CRITERION J.10.k

Identification of and means for dealing with potential impediments (e.g., seasonal impassability of roads) to use of evacuation routes, and contingency measures;

Applicability and Cross-Reference to Plans: Licensee __ State X Local X

TO MEET THE INTENT OF CRITERION J.10.k, ORO PLANS/PROCEDURES SHALL DESCRIBE:

- ✓ Resources available (e.g., personnel and equipment) to clear impediments to evacuation and emergency response in areas affected by incidents; and
- ✓ Responsibility for directing resources and rerouting traffic, as needed.

EXPLANATION

The plans/procedures identify resources, including personnel and equipment (e.g., tow trucks and snow plows), that may be called on to clear impediments to evacuation and emergency response in areas affected by an incident. Where outside resources will be used, the plans/procedures include or reference LOAs as described in Criterion A.3. The plans/procedures also designate, by title/position, who will be responsible for directing such resources and for rerouting traffic as necessary.

REFERENCES

- *National Incident Management System*, December 2008.
- *Comprehensive Preparedness Guide 101: Developing and Maintaining State, Territorial, Tribal, and Local Government Emergency Plans*, Version 2, November 2010.

NUREG CRITERION J.10.l

Time estimates for evacuation of various sectors and distances based on a dynamic analysis (time-motion study under various conditions) for the plume exposure pathway emergency planning zone (see [NUREG-0654/FEMA-REP-1] Appendix 4);

Applicability and Cross-Reference to Plans: Licensee __ State X Local X

TO MEET INTENT CRITERION J.10.l, ORO PLANS/PROCEDURES SHALL DESCRIBE OR REFERENCE:

- ✓ Time estimates for evacuation of various sectors or evacuation areas; and
- ✓ The times required for the movement of school children and other persons with disabilities and access/functional needs.

EXPLANATION

The plans/procedures contain or reference a concise summary of ETEs for general and persons with disabilities and access/functional needs under various conditions. ETEs are defined as the time it will take each population to move from the point of notification to the outer boundary of the 10-mile EPZ. Also see discussion under Criterion J.10.i.

REFERENCES

- NUREG/CR7002, *Criteria for Development of Evacuation Time Estimate Studies.*

NUREG CRITERION J.10.m

The bases for the choice of recommended protective actions from the plume exposure pathway during emergency conditions. This shall include expected local protection afforded in residential units or other shelter for direct and inhalation exposure, as well as evacuation time estimates.[51]

Applicability and Cross-Reference to Plans: Licensee X State X Local __

TO MEET THE INTENT OF CRITERION J.10.m, ORO PLANS/PROCEDURES SHALL DESCRIBE:

- ✓ The rationales for any preplanned precautionary actions, including the triggering events that would lead to the decision to implement these actions;
- ✓ The rationales used to make initial PADs; and
- ✓ The rationales used for subsequent PADs, including the consideration of various possible options.

EXPLANATION

PADs are measures taken in anticipation of, or in response to, a release of radioactive material to the environment. Sheltering and evacuation are the two PADs that are relied upon for limiting the direct exposure of the general public within the plume exposure EPZ. The plans/procedures describe the methods for determining which PAD, evacuation or sheltering (or some combination thereof, including evacuation in stages), will provide the overall greater protection.[52] Initial PADs for the general public may be based on plant status information; it is not necessary to wait for calculations of projected dose.

It is also possible to implement PADs for selected portions of the population prior to the need for protective actions for the general population; if such precautionary actions are being considered for use, the plans/procedures explain the rationale for this decision.

During the planning process, it is appropriate to review factors that may affect evacuation, including the characteristics of the area and population groups requiring special assistance. This process considers protection factors for direct exposure and from inhalation exposure in shelters. Conclusions based on these reviews are included in the plans/procedures. The following considerations are important in the process of deciding between evacuation and sheltering:

- A GE is the first ECL where protective actions would be required. The NUREG-0654/FEMA-REP-1, Appendix 1, definition of a GE includes the statement that "Releases can be reasonably expected to exceed the EPA Protective Action Guideline exposure levels offsite for more than the immediate site area."
- The May 1992 EPA plume PAGs already discount the reduction in average dose that results from sheltering. Therefore, the projected dose that will be compared to the PAGs does not take into account dose reduction that result from sheltering. Consideration of sheltering effectiveness in reducing dose is appropriate only for evaluating whether sheltering will provide overall greater protection than evacuation.
- The protection factor for wood frame houses is 0.9. Because there are no known plume-exposure EPZs without any wood frame houses, the dose reduction compared to direct exposure would be only 10 percent for at least a portion of the shelters.

[51] The following reports may be considered in determining protection afforded: EPA 400-R-92-001, *Manual of Protective Action Guides and Protective Actions for Nuclear Incidents*, May 1992. EPA 400-R-92-001 replaced the original reference to three older documents per NUREG-0654/FEMA-REP-1, Revision 1, *Addenda*, dated March 2002.

[52] Updated FEMA and NRC guidance in NUREG-0654/FEMA-REP-1, Revision 1, Supplement 3, *Guidance for Protective Action Strategies*, October 2011, provides a protective action logic development tool that should be used by licensees to develop site specific protective action recommendation procedures and is recommended for use by OROs to develop protective action strategy guidance for decision makers.

- Air infiltration into shelters, even if the windows and doors are closed and heating and ventilating systems are shut down, rapidly decreases the effectiveness of the shelter if it is exposed to the plume for more than 2 hours. Also, unless there is a mechanism to establish when the plume has left the area so that shelters can be promptly ventilated, much of any dose reduction achieved when the plume arrived will be lost after the plume has departed.
- There will be significant uncertainty associated with the various parameters needed to make any dose projection (e.g., the radionuclide release rate, the radionuclide release duration, the time of the start of any radionuclide release, and meteorological conditions including wind speed and wind direction).
- For the worst core melt sequences, immediate life-threatening doses would generally not occur outside the EPZ.
- There may be site- and incident-specific conditions that affect evacuation, including traffic impediments, adverse weather conditions, an airborne radioactive plume, or areas affected by hostile actions.

Because of the significant uncertainties in the potential source term (i.e., the amount of radioactive material released to the environment following an accident), the minimal dose reduction available from sheltering, and the possibility of high doses near the site, evacuation usually is the prudent initial protective action at the time of the incident, based solely on plant status information without dose projection calculations.

OROs that elect to follow alternate approaches must include sufficient detail to explain their rationale.

For subsequent PADs, if source term or environmental data are available, the results of dose projection calculations are considered in the decision process. The methodology used for such dose projections is covered under Criterion I.10. The plans/procedures delineate the decision processes leading to the choice of a protective action. It may be helpful to include a "decision tree" or graphic illustration of the variables and trade-offs associated with the various protective action options.

Along with any evacuation decision, the plans/procedures provide for establishing access control to prevent unnecessary entry into the evacuated areas (see Criterion J.10.j.). In addition, if possible, the plans/procedures provide for the use of traffic control to assist with the flow of evacuation traffic.

REFERENCES

- NUREG-0654/FEMA-REP-1, Revision 1, Part I.D, *Planning Basis*.
- NUREG-0654/FEMA-REP-1, Revision 1, Supplement 3, *Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants – Guidance for Protective Action Strategies*, October 2011.
- EPA-400-R-92-001, *Manual of Protective Action Guides and Protective Actions for Nuclear Incidents*, May 1992.
- NUREG-0654/FEMA-REP-1, Revision 1, *Addenda*, dated March 2002.
- *National Response Framework, Nuclear/Radiological Incident Annex*, June 2008.
- *National Response Framework, Mass Evacuation Incident Annex*, June 2008.
- *Comprehensive Preparedness Guide 101: Developing and Maintaining State, Territorial, Tribal, and Local Government Emergency Plans*, Version 2, November 2010.

NUREG CRITERION J.11

Each State shall specify the protective measures to be used for the ingestion pathway, including the methods for protecting the public from consumption of contaminated food-stuffs. This shall include criteria for deciding whether dairy animals should be put on stored feed. The plan shall identify procedures for detecting contamination, for estimating the dose commitment consequences of uncontrolled ingestion, and for imposing protection procedures such as impoundment, decontamination, processing, decay, product diversion, and preservation. Maps for recording survey and monitoring data, key land use data (e.g., farming), dairies, food processing plants, water sheds, water supply intake and water treatment plants and reservoirs shall be maintained. Provisions for maps showing detailed crop information may be made by including reference to their availability and location and a plan for their use. The maps shall start at the facility and include all of the 50-mile ingestion pathway EPZ. Up-to-date lists of the name and location of all facilities which regularly process milk products and other large amounts of food or agricultural products originating in the ingestion pathway Emergency Planning Zone, but located elsewhere, shall be maintained.[53]

Applicability and Cross-Reference to Plans: Licensee __ State _X_ Local __

TO MEET THE INTENT OF CRITERION J.11, ORO PLANS/PROCEDURES SHALL DESCRIBE:

- ✓ The individual(s), by title/position, and organization with the authority to make decisions in the ingestion pathway planning zone.
- ✓ The ingestion protective actions planned and the rationale for the selection of actions, also see Criteria J.9. and J.10.m.
- ✓ The methodology used to designate the areas of concern where monitoring and sampling will be implemented.
- ✓ The methodology for collecting agricultural samples, including identifying field team members, providing necessary supplies, names and addresses of contact points to obtain permission to collect samples, and chain of custody procedures.
- ✓ The analytical laboratory capability to analyze various samples and the procedure for reporting analytical results to the appropriate organization.
- ✓ The location and means of obtaining up-to-date information on licensed agribusiness facilities within the EPZ. This information includes dairies, food processing plants, surface water supplies, water intakes, farmers markets, farm stands, nurseries, and other permanent facilities. Information also includes facilities outside the EPZ that could receive potentially contaminated products from within the EPZ, including names and telephone numbers for points of contact.
- ✓ The location and means of obtaining up-to-date information on land use (i.e., which crops are being grown in which areas). This information includes the status of harvesting.
- ✓ The DILs that would warrant implementation of protective actions and the rationale and assumptions used to develop the DILs.
- ✓ The availability of suitable maps for recording various data. The use of electronic means to capture and map survey and dose data (e.g., geographic information systems) are acceptable.
- ✓ The means by which the agribusiness person will be notified of a PAD that would affect his/her ability to sell or move food or agricultural products.

[53] The *Emergency Response Resources Guide for Nuclear Power Plant Emergencies*, NUREG-1442, Rev. 1/FEMA-REP-17, Rev.1 (July 1992), identifies resources available to principal participants in an emergency response to a major nuclear emergency at a commercial NPP and contains general functional areas that would need to be considered in responding to this type of incident.

EXPLANATION

The plans/procedures identify, by title/position, the person who makes the PADs for the ingestion exposure pathway. The recommendations on incidental radioactive contamination of human food and animal feeds advise that public health risk be averted by limiting the radiation dose received from eating contaminated food.[54] This goal will be accomplished by:

- Setting DILs on the radionuclide activity concentration permitted in human food. A DIL corresponds to the radiation concentration in food throughout the relevant time period that, in the absence of any intervention, could lead to an individual receiving a radiation dose equal to the PAG or, in international terms, the intervention levels of dose; and
- Taking precautionary or protective actions to reduce the amount of contamination.

PADs for the ingestion exposure pathway are actions taken to limit the radiation dose from ingestion by avoiding or reducing the contamination that could occur on the surface of, or be incorporated into, human food and animal feeds. Such actions can be taken prior to and/or after confirmation of contamination. The protective actions for a specific incident are determined by the particulars of the incident and, once initiated, they continue at least until the concentrations are expected to remain below the DILs.

For the ingestion exposure pathway, there are two categories of PADs: (1) preventive protective actions and (2) emergency protective actions. Preventive protective actions are taken to prevent or reduce contamination of milk, food, and drinking water. Emergency protective actions are taken to isolate food to prevent its introduction into commerce and to determine whether condemnation or other disposition is appropriate. Both preventive and emergency protective actions are considered "precautionary" if they are undertaken before verifying radionuclide measurements by field monitoring or laboratory analysis.

a. Precautionary Actions

Precautionary actions taken prior to confirmation of contamination include:

- Simple precautionary actions to avoid or reduce the potential for contamination of food and animal feeds. These will not guarantee that contamination in food will be below the DILs, but the severity of the problem should be significantly reduced. Typical precautionary actions include covering exposed products, moving animals to shelter, corralling livestock, and providing protected feed and water.
- Temporary embargoes to prevent food that is likely to be contaminated from entering into commerce. Because of potential economic impacts, OROs must take care when determining the area for a temporary embargo prior to determining the levels of contamination in food.

Precautionary actions can be taken before the release or arrival of contamination if officials have advance knowledge that radionuclides may contaminate the environment. Determinations of what protective actions would be taken, and when, may be based on the ECLs. OROs may consider precautionary actions before declaration of a Site Area Emergency or General Emergency if predictions of the extent and magnitude of the offsite contamination are persuasive. Precautionary actions related to the embargo of unlicensed agricultural products may be addressed in public messages and other informational brochures.

OROs should include methods to track food leaving and limit food entering the EPZ in appropriate plans and procedures.

b. Determination of Contamination in Food

The plans/procedures identify how the levels of contamination in food will be determined. This includes sampling and analysis capability.

[54] For further information, see the HHS/FDA guidance, *Accidental Radioactive Contamination of Human Food and Animal Feeds: Recommendations for State and Local Agencies*, August 13, 1998.

c. Protective Actions for Foods Confirmed to be Contaminated

Protective actions when the contamination in food equals or exceeds the DILs include:

- Temporary embargoes to prevent contaminated food from entering into commerce from a contaminated area when the presence of contamination is confirmed, but the concentrations are not yet known. The temporary embargo would continue until measurements confirm that concentrations are below the DILs.
- Normal food production and processing actions that reduce the amount of contamination in or on food to below the DILs.
- Condemnation of foodstuff. The foodstuff would not be allowed into commerce and would be disposed of in accordance with State and/or Federal regulations.
- Methods to track food leaving and limit food entering the EPZ by appropriate jurisdictions.

d. Protective Actions for Animal Feeds Confirmed to be Contaminated

Protective actions to reduce the impact of contamination in or on animal feeds, including pasture and water, are taken on a case-by-case basis. Protective actions when animal feeds are contaminated include:

- Substituting uncontaminated water for contaminated water;
- Removing lactating dairy animals and meat animals from contaminated feeds and pasture; and
- Substituting uncontaminated feed for contaminated food.

Putting dairy animals on stored feed and protected water does not imply that the structure needs to be closed to outside air, as is the case when discussing sheltering for the general population. If a suitable structure is not available, provision of stored feed and protected, and therefore uncontaminated, water is adequate. Testing will be necessary to ensure the foodstuff is not contaminated.

e. Sampling and Analysis

The plans/procedures describe the rationale for selecting the sampling areas. The plans/procedures also describe resources for collecting food and agricultural product samples in the areas of concern, including use of chain-of-custody documentation. The plans/procedures provide information about the laboratory's capability to analyze the various samples and list DILs (i.e., concentration levels of various radionuclides in various foods that would be equivalent to the PAGs, which are expressed in rem). The specified sampling protocols and laboratory analysis methods must be capable of determining concentrations at levels at least as low as the DILs.

f. Maps

Maps are maintained and available for recording a variety of data. The plans/procedures make provisions for recording field survey readings and projected ingestion doses on appropriate maps. The use of electronic means to capture and map survey and dose data (e.g., geographic information systems) is acceptable. Also, the plans/procedures make provisions for recording land use information, such as the location of agribusiness activities (e.g., dairies, food processing plants, surface water supplies, water supply intakes, and other permanent activities). Processing plants that are located *within* the EPZ are identified. Plans/procedures further delineate those plants that receive potentially contaminated products from *inside* the EPZ and those that receive products from *outside* of the EPZ. The plans/procedures describe a means to access information regarding the location of various crops. This information changes frequently and the plans/procedures specify where up-to-date information is available and how it can be obtained. The plans/procedures include provisions for obtaining information, from county or local agriculture extension offices, on the status of harvesting operations within the areas of concern (i.e., which crops are being harvested or are near harvesting).

g. Decision-Making

The plans/procedures specify the individual, by title/position, and organization authorized to make decisions regarding any of the protective actions outlined above.

The plans/procedures include specific steps necessary to implement PADs. The plans/procedures identify the organization(s) that have the authority to prohibit the sale or movement of food or agricultural products and describe the process to prevent the sale or movement of products of concern.

REFERENCES

- EPA-400-R-92-001, *Manual of Protective Action Guides and Protective Actions for Nuclear Incidents*, May 1992.
- NUREG-1442, Revision 1/FEMA-REP-17, Revision 1, The *Emergency Response Resources Guide for Nuclear Power Plant Emergencies*, July 1992.
- Federal Register, Volume 63, No. 156, pp.43402-43403, *Accidental Radioactive Contamination of Human Food and Animal Feeds: Recommendations for State and Local Agencies*, Food and Drug Administration, August 13, 1998.

NUREG CRITERION J.12

Each organization shall describe the means for registering and monitoring of evacuees at relocation centers in host areas. The personnel and equipment available should be capable of monitoring within about a 12hour period all residents and transients in the plume exposure EPZ arriving at relocation centers.

Applicability and Cross-Reference to Plans: Licensee __ State X Local X

TO MEET THE INTENT OF CRITERION J.12, ORO PLANS/PROCEDURES SHALL DESCRIBE:

- ✓ Radiological monitoring of evacuees, service animals, vehicles, and possessions. OROs need to be capable of monitoring 20 percent of the EPZ population (including transients) assigned to each facility within a 12-hour period.
- ✓ Decontamination procedures, including the trigger/action levels that indicate the need for decontamination activities and procedures for medical attention referral.
- ✓ Contamination control measures, such as safety requirements, decontamination site layout, and decontamination protocol.
- ✓ The physical layout of the area, with diagrams that show the flow and layout of operations, including a description of the means for separating contaminated, uncontaminated, and unscreened individuals, vehicles, and service animals.
- ✓ The processes for registering evacuees and service animals in host/support jurisdictions, including documentation of monitoring for referral to temporary care facilities.

EXPLANATION

a. Monitoring

The plans/procedures provide for adequate resources, including trained personnel and functional, up-to-date equipment, for radiological monitoring of a minimum of 20 percent of the total EPZ population at reception/relocation centers in host/support jurisdictions. The 20 percent planning basis does not include re-monitoring of persons who have been decontaminated. This monitoring is conducted within about a 12-hour period.

"Total EPZ population" includes residents, estimated number of commuters, anticipated seasonal transient populations, and special facility populations. The estimated number of persons to be monitored will indicate the personnel and equipment resource requirements at each reception/relocation center. The FEMA guidance document *Contamination Monitoring Guidance for Portable Instruments Used for Radiological Emergency Response to Nuclear Power Plant Accidents*, FEMA-REP-22 (October 2002), indicates

the time it takes to monitor an individual, vehicle, and equipment and other possessions using hand-held instruments. For hand-held equipment, the number of monitoring kits needed is one-half the number of monitors needed since the equipment can be used for both shifts. The plans/procedures indicate the types of monitoring equipment that will be used.

If portal monitors are used, the plans/procedures indicate the types of monitors, monitoring capacity in persons per hour, and number of trained personnel required to operate the equipment. Regardless of manufacturer claims, there are challenges to using portal monitors on vehicles. However, portal monitors may be used on portions of vehicles if the user can demonstrate the sensitivity of the instrument to the standards described in FEMA REP-22. If the 0.0085 μCi/cm2 can be detected on certain portions of the vehicle, a portal monitor may be used in tandem with a hand-held monitor. It is the responsibility of the user to demonstrate the detection sensitivity of the portal monitor in the scanned zone using the planned monitoring technique. Some areas of the vehicle, such as the grill and roof, may still need to be monitored by hand. The interior of a vehicle will still need to be monitored by hand.

The plans/procedures indicate the triggers/action levels requiring decontamination.[55] For trigger/action levels for portal monitors, refer to FEMA-REP-21. The trigger/action level is reported in units appropriate for the type of monitoring instrument.

Service animals accompanying evacuees with disabilities and access/functional needs are monitored in accordance with the same standards and trigger/action levels for decontamination as humans.

The plans/procedures also indicate how monitoring data will be documented. OROs keep a list or other record of all persons, vehicles, and service animals monitored, and whether contamination was detected. Forms are typically used for recording monitoring results and should be included in the plans/procedures.

b. Decontamination

Good health physics practices and the philosophy of "as low as reasonably achievable" require that the plans/procedures provide for decontamination of individuals, vehicles, and service animals found to be contaminated during the monitoring process.

Decontamination capabilities available at a reception or relocation center include, at a minimum, sinks and showers with soap and water and changes of clothing. Localized contamination (e.g., hands or face) can be removed by washing in a sink; contamination in other areas may require a shower.

Decontamination methods for equipment and vehicles may include: (1) using vacuum cleaners, preferably with high-efficiency particle filters; (2) scrubbing contaminated areas with soap and water; (3) generously applying low-pressure water and soap solutions to affected areas; and (4) applying organic solvents on greasy or waxed surfaces.

Plans/procedures describe equipment and processes for addressing contaminated individuals, personal items, vehicles, and equipment. The plans/procedures provide for re-monitoring of individuals, vehicles, and equipment after decontamination. Same-sex monitors are available for re-monitoring of individuals after decontamination. Individuals who cannot be decontaminated with simple soap and water washing are referred to the care of qualified medical or health physics personnel for further evaluation and/or decontamination measures.

The plans/procedures indicate the number of decontamination attempts to be made before an individual is sent to a medical facility, as well as which medical facilities will receive persons who could not be decontaminated. Vehicles and equipment that cannot be decontaminated are held in an appropriate location with restricted access until further instructions and/or monitoring/decontamination measures are authorized.

[55] "Trigger/action level" is a designated value whereby an individual is directed to perform a specific action. This term is used in plans/procedures synonymously with the terms "trigger level," "action level," or "decision criterion."

c. Contamination Control

The plans/procedures describe contamination control methods (e.g., proper floor coverings, personal protective equipment worn by trained emergency personnel). Plans/procedures show the physical layout of the monitoring and decontamination center in diagrams, including the number of personnel, and flow of evacuees and vehicles through designated zones of operation. The flow ensures that individuals, vehicles, and service animals that have been monitored and found to be uncontaminated are kept separate from contaminated and unmonitored individuals, vehicles, and service animals. Individuals, service animals, and vehicles exiting the monitoring and decontamination area are provided with means (e.g., hand stamp, sticker, bracelet, form, etc.) indicating that they and their service animals, and vehicles, where applicable, have been monitored, cleared and found to have either no contamination or contamination below the trigger/action level or their vehicle has been placed in a secure area until it can be monitored and decontaminated, if necessary.

In accordance with plans/procedures, individuals found to be clean after monitoring do not need to have their vehicle monitored, nor do they require confirmation that their vehicle is free from contamination prior to entering the congregate care areas. However, those individuals who are found to be contaminated and are then decontaminated will have their vehicles monitored and decontaminated (if applicable) or placed in a secure area and do require confirmation that their vehicle is free from contamination or is being placed in a secure area prior to entering the congregate care areas.

Plans/procedures indicate the agency or organization responsible for handling contaminated waste (e.g., clothing and personal articles) at reception centers, as well as the location where the wastes will be initially stored and how the storage areas will be marked and secured. The plans/procedures also discuss facilities for handling evacuees' service animals, contaminated vehicles, and possessions, including storage, security, and owner identification. Waste water from decontamination operations does not need to be collected.[56]

d. Registration

The plans/procedures identify the means for registering evacuees and their service animals. Forms or electronic means (e.g., audio, audio/video) may be used. Registration forms include name, address, family members, and time of arrival at the facility. If American Red Cross personnel assist in this process, their registration forms may be used. Plans/procedures describe the types of data to be collected and method (e.g., form or ticket provided to evacuee) of verifying that they have been monitored and found to be uncontaminated.

REFERENCES

- FEMA-REP-2, Revision 2, *Guidance on Offsite Emergency Radiation Measurement Systems, Phase 1 – Airborne Release*, June 1990.
- FEMA-REP-21, *Contamination Monitoring Standard for a Portal Monitor Used for Radiological Emergency Response*, March 1995.
- FEMA-REP-22, *Contamination Monitoring Guidance for Portable Instruments Used for Radiological Emergency Response to Nuclear Power Plant Accidents*, October 2002.
- EPA-400-R-92-001, *Manual of Protective Action Guides and Protective Actions for Nuclear Incidents*, May 1992.
- *National Response Framework, Nuclear/Radiological Incident Annex*, June 2008.
- *National Response Framework, Mass Evacuation Incident Annex*, June 2008.
- Pub.L. 109-295, October 4, 2006.

[56] FEMA Policy statement, *Policy statement on Disposal of Waste Water and Contaminated Products from Decontamination Activities*, January 1989.

11. Planning Standard K – Radiological Exposure Control

Means for controlling radiological exposures, in an emergency, are established for emergency workers. The means for controlling radiological exposures shall include exposure guidelines consistent with EPA Emergency Worker and Lifesaving Activity Protective Action Guides.

NUREG CRITERION K.1

Each licensee shall establish onsite exposure guidelines consistent with EPA Emergency Worker and Lifesaving Activity Protective Action Guides (EPA 520/175/001[57]) for:

a. removal of injured persons;

b. undertaking corrective actions;

c. performing assessment actions;

d. providing first aid;

e. performing personnel decontamination;

f. providing ambulance service; and

g. providing medical treatment services.

Applicability and Cross-Reference to Plans: Licensee _X_ State __ Local __

NOTE: When State exposure limits differ from EPA emergency worker and lifesaving activity PAGs, OROs should obtain agreements between the State and licensee regarding administrative dose limits and turn back values for all ORO emergency workers responding on site.

NUREG CRITERION K.2

Each licensee shall provide an onsite radiation protection program to be implemented during emergencies, including methods to implement exposure guidelines. The plan shall identify individual(s), by position or title, who can authorize emergency workers to receive doses in excess of 10 CFR Part 20 limits. Procedures shall be worked out in advance for permitting onsite volunteers to receive radiation exposures in the course of carrying out lifesaving and other emergency activities. These procedures shall include expeditious decision making and a reasonable consideration of relative risks.

Applicability and Cross-Reference to Plans: Licensee _X_ State __ Local __

NUREG CRITERION K.3.a

Each organization shall make provision for 24-hour-per-day capability to determine the doses received by emergency personnel involved in any nuclear accident, including volunteers. Each organization shall make provisions for distribution of dosimeters, both self-reading[58] and permanent record devices.

Applicability and Cross-Reference to Plans: Licensee _X_ State _X_ Local _X_

[57] Original reference to EPA-520/1-75-001 replaced with EPA-400-R-92-001 per NUREG-0654/FEMA-REP-1, Revision 1, *Addenda*, March 2002.

[58] Self-reading dosimeters are now referred to as "direct-reading" dosimeters.

TO MEET THE INTENT OF CRITERION K.3.a, ORO PLANS/PROCEDURES SHALL DESCRIBE:

- ✓ Methods or options for emergency worker exposure control, to include exposure from inhalation;
- ✓ Dose limits for emergency workers;
- ✓ Types and quantities of dosimeters and dosimeter chargers available per location and the number of emergency workers needing dosimetry devices;
- ✓ Process for reading PRDs and any early reading of PRDs (e.g., when an emergency worker's task assignment is completed or as otherwise specified);
- ✓ Specific dosimetry instructions, including when, where, and to whom individuals return their dosimetry devices;
- ✓ Dosimetry storage locations;
- ✓ Distribution of dosimetry to all emergency workers and, when permitted, members of the public needing access to the restricted area; and
- ✓ Proper documentation of authorization to exceed administrative dose limits.

EXPLANATION

The plans/procedures include provisions for maintaining 24-hour capabilities to determine radiation doses to any emergency worker who may be potentially exposed to ionizing radiation as a result of an incident. These provisions also address access to and distribution of personal monitoring equipment (i.e., dosimetry) to the emergency workers.

a. Definition of Emergency Worker

In the REP program an emergency worker is an individual who has an essential mission to protect the health and safety of the public and could be exposed to ionizing radiation from the plume or its deposition. Emergency workers include, but are not necessarily limited to, radiological field monitoring personnel; traffic control personnel; law enforcement personnel; fire and rescue personnel; emergency medical services personnel; evacuation vehicle (e.g., buses, vans, etc.) drivers; back-up route alerting personnel; EOC personnel, where the EOC is within the EPZ; personnel who may deal with potentially contaminated individuals or objects, such as reception center personnel, medical facility personnel, and emergency worker decontamination center personnel; and essential services or utility personnel (e.g., electricity, gas, water, water treatment, telephone, etc.). Note that evacuation vehicle drivers who will be transporting individuals or groups out of the EPZ and who are not expected to return to the EPZ may be considered "emergency workers."

b. Dosimeters

Dosimeters are instruments for measuring external exposure to ionizing radiation. They do not measure internal committed dose from inhaled or ingested materials. Dosimeters are available in two basic types: permanent/non-direct-reading (PRD) and direct-reading (DRD).

- **PRDs.** The plans/procedures describe capability to provide a PRD to each emergency worker. The dosimeter will provide an accurate record of the ionizing exposure received by the emergency worker over the duration of the incident. The thermoluminescent dosimeter or film badge is read by a processor accredited by the National Voluntary Laboratory Accreditation Program or other accreditation program in accordance with American National Standards Institute, Standard N13.11-2009, *Personal Dosimetry Performance Criteria for Testing*. Accreditation is for the specific type of dosimetry in use and is for the type of radiation(s) for which the individual wearing the dosimeter is monitored.

- **DRDs.** The plans/procedures describe the capabilities to provide DRDs to emergency workers who could be exposed to ionizing radiation. Two major types of DRDs are acceptable for use in emergency response: (1) the ion chamber electroscope and (2) the electronic dosimeter with an LED display and alarm circuit. Either type allows the emergency worker real-time access to information concerning gamma exposure incurred since the device was last zeroed. Electronic dosimeters could be subject to some degree of radio frequency interference. The amount of radio frequency

interference depends on the amount of shielding in the dosimeter design and the frequency range. The electronic dosimeters should be tested with any hand-held radios or cellular telephones that may be used by the emergency responders to determine whether the dosimeter will be affected by radio frequency interference. If the manufacturer states there is no radio frequency interference, this may be considered in lieu of test.

EPA 400-R-92-001 calculates dose to both the emergency workers and the general public. The dose that is compared to emergency worker dose limits or early-phase PAGs is the sum of the external dose from gamma radiation and the committed effective dose equivalent from internal exposure caused by inhalation of radioactive material. This combined total measurement is referred to as the TEDE.

Dosimeters measure external exposure to gamma radiation, but not the dose from airborne radioactive material that is inhaled and that may contribute a major portion of the TEDE. Dose to the thyroid from uptake of radioiodine is mitigated by the correct and timely administration of KI. Although dose from inhalation of particulate materials could be controlled by properly fitted respirators, respirators are not generally practical for radiological emergency response. DRDs are commonly used, along with appropriate adjustment factors to account for the inhalation portion of the dose, to estimate the TEDE during the emergency phase. Assessment of the actual TEDE received by individual emergency workers is conducted after the emergency is over.

Issuing the Right Dosimetry

A mathematical conversion factor is used to translate DRD readings in units of R into applicable dose limits in units of rem.

For example, if the state uses a conversion factor of 5, emergency workers multiply the reading on their DRD by 5 and compare the result to the administrative limits in the plans/procedures.

Therefore, if the applicable dose limit is 5 rem, **the minimum acceptable dosimetry issued to emergency workers must be capable of reading 1 R to provide the information needed to accurately monitor their exposure.**

Since the dose that emergency workers read on their DRDs in units of R is not directly comparable to the TEDE administrative dose limits they are given in units of rem, any discussion of a recommended system or a minimum acceptable system for dosimetry needs to be coupled with the methodology adopted by the State for the conversion of DRD readings into estimated TEDE. The dosimetry OROs issue to emergency workers must be capable of measuring dose in the appropriate range to allow emergency workers to determine whether they have reached the administrative limits. The EPA-400-R-92-001 guidance is to use a factor of 5 for this conversion (see dose control discussion in the next section); however States may be more conservative. If the State adopts administrative dose limits or turn-back values that are more restrictive than EPA dose limits, the DRDs provided to emergency workers must be able to read R in the range that will correspond to the administrative limit when the selected factor is applied.

While using 1 dosimeter is acceptable and meets the minimum criteria, it is better to ensure the ability to measure a wide range of exposure, either by using two DRDs (one low-range and one high-range) or a low-to-high-range electronic personal dosimeter. The use of the high-range DRD is appropriate because of the potential for doses greater than 25 rem during life-saving missions and missions to protect large populations. These missions are assigned only to those emergency workers who volunteer to receive doses in excess of 25 rem TEDE. Real life-saving missions are likely to arise without warning. In such cases, there will probably not be time to issue additional dosimetry, so use of both high-range and low-range DRDs is recommended.

Those individuals with assignments outside the 10-mile EPZ who might come into contact with radioactive materials are required to have PRDs. Because there is little chance of inhalation exposure by these individuals, a factor to convert R as read by the DRDs to rem TEDE is not needed. Group dosimetry for these emergency workers is permitted. Group dosimetry is accomplished by issuing a PRD to each individual, then using one or more area DRDs to monitor exposure of the entire group. Group dosimetry is also permitted for emergency workers assigned to a fixed facility inside the 10-mile EPZ; however, if emergency workers are deployed outside the building, including moving to an alternate facility, they must be issued a DRD.

c. Dose Control and Limits

The plans/procedures incorporate the following dose limits for emergency workers, as provided in EPA 400-R-92-001, or more restrictive limits:

- 5 rem for any emergency activities;
- 10 rem for activities to protect valuable property where a lower dose is not practical;
- 25 rem for life-saving activities or protection of large populations where a lower dose is not practical; and
- Greater than 25 rem for life-saving activities or protection of large populations where only emergency workers who volunteer for higher doses are allowed and only if they have been made fully aware of the risks.

The plans/procedures also explain that the dose limits for emergency workers apply only during the emergency phase. The emergency phase ends when (1) the utility determines that the release has terminated; and (2) the responsible ORO has determined that public safety is ensured by appropriate protective actions in accordance with applicable PAGs and that valuable property has been protected. Doses incurred by emergency workers after these conditions are met are controlled according to dose limits for occupational exposure, as identified in the State radiation control program's regulatory requirements or 10 CFR Part 20, whichever is more restrictive.

The following three options for dose control are considered acceptable for implementing the EPA dose limits for emergency workers. Other options may be submitted for consideration.

- **Option 1.** Until evacuation of the general public is complete, monitoring and control of emergency worker dose is based only on gamma radiation exposure as measured by a DRD without regard to additional dose received from inhalation. Emergency workers entering the plume after evacuation of the general public has been completed will be assigned a predetermined administrative dose limit, stated in terms of external radiation dose only, that is lower than the maximum TEDE dose recommended by the EPA for the class of emergency response activity to be performed. The TEDE calculation for emergency workers who have ingested KI does not include the contribution from thyroid dose due to inhalation of radioiodine, as that contribution will be minimal if KI is administered prior to exposure. The lower administrative dose limit may account for: (1) the radiation dose already received by the emergency workers and (2) the calculated ratio of external dose to the TEDE. The basis of this calculated ratio will be dose projections provided by the licensee or measurements of the radionuclide mix in the plume. This calculated ratio is based on dose projections using utility-provided source terms or measurements of the radionuclide mix in the plume.

- **Option 2.** An administrative limit on the dose to emergency workers entering the plume is determined in advance and documented in emergency plans/procedures. The administrative limit is stated in terms of the external dose measured by a DRD. To account for the inhalation dose, which cannot be measured prior to or during a mission, the administrative limit is set lower than the limit for each class of activity recommended by EPA. By selecting an appropriate value for the administrative limit on measured external dose and restricting emergency workers to that limit, there can be reasonable assurance that after including the dose from inhalation, the TEDE to an emergency worker is unlikely to exceed the applicable limit. The TEDE calculation for emergency workers who have ingested KI does not include the contribution from thyroid dose due to inhalation of radioiodine, because that contribution will be minimal if KI is administered prior to exposure. For the less severe but more probable reactor incident sequences, the TEDE to emergency workers who have taken KI is unlikely to exceed 5 times their measured external dose as shown on DRDs. Therefore, if the external dose measured by a DRD is limited to 1/5 of the applicable limit, the TEDE is unlikely to exceed the limit. For example, if the external dose measured by a DRD is limited to 5 R, the TEDE is unlikely to exceed 25 rem.

- **Option 3.** Administrative dose limits for emergency workers are not predetermined, but are calculated for the specific incidental release anticipated or in progress. The limits are based on dose calculations similar to those used to determine the need for public protective actions. The limits, stated in terms of external dose measured by a DRD, would be set low enough to keep the TEDE to emergency workers below the maximum dose recommended for the various classes of activity.

The TEDE calculation for emergency workers who have taken KI does not include the contribution from thyroid dose due to inhalation of radioiodine, because that contribution will be minimal if KI is administered prior to exposure. The dose limits could remain the same throughout an emergency, or they could be revised periodically on the basis of knowledge of the radionuclide constituents of the plume.

The plans/procedures indicate the arrangements for calculating retrospective determinations of TEDE. OROs do not need to undertake such retrospective analyses; instead they may rely on those conducted by utilities and Federal agencies. PRDs could provide the external dose component; OROs should keep records on the time history of exposure.

d. Record Keeping

OROs keep a record listing the persons to whom both PRDs and DRDs are assigned. Emergency workers keep their assigned PRDs throughout the emergency phase, unless their lead organization requests them earlier to verify anomalous readings on a DRD or the radiological officer reissues all PRDs. OROs may assign a DRD to another emergency worker provided it has been re-zeroed and the initial reading recorded for the other individual, along with its serial number or other means of identification. OROs provide a specific contact, time, and location for return of all dosimeters.

e. Quantities

The plans/procedures indicate the quantities of dosimetry available. Each emergency worker with assignments where he or she may be exposed to radiation requires a PRD. Emergency workers with assignments in the plume EPZ require DRDs. The State determines whether DRDs are required for emergency workers and/or teams with assignments outside of the plume EPZ. OROs may consider using group dosimetry for emergency workers who work in close proximity to each other (e.g., reception centers, hospital/medical facility emergency rooms, EOCs). If OROs use group dosimetry, the plans/procedures need to reflect that and include a description of the dosimetry storage location and its use. During response to HAB incidents, licensees and OROs coordinate use of group dosimetry for ORO emergency workers responding onsite.

f. Distribution

The plans/procedures describe how to distribute dosimetry to all emergency workers and, when permitted, to members of the public needing access to the restricted area. If OROs store dosimetry somewhere other than the distribution location, the plans/procedures specify the method for transporting dosimetry to the distribution location. The plans/procedures address how the OROs will overcome possible shortages during an emergency.

g. Considerations for HAB incidents

Under REP scenarios, the number of responders needing dosimetry and KI – and the levels of radiation to which they may be exposed – has been fairly predictable. In an HAB incident, however, there will likely be an increased number of emergency workers (e.g., local law enforcement agency personnel, firefighters, and medical services personnel) potentially exposed to and requiring protection from radiation levels above their normal exposure from their response on or near the NPP site to support incident mitigation efforts. In particular, there may be an immediate need for certain responders to enter areas where they require protection and where they may exceed dose limits (e.g., for life saving or law enforcement actions). There also may be prolonged response and recovery operations (e.g., for forensic investigation, plant security, victim recovery operations) that may result in greater cumulative worker exposure, which will have further impacts on equipment and supply inventories.

As a result, plans/procedures for emergency worker protection during an HAB incident address the following issues:

Resource availability. The increased number of responders will put a strain on the existing supply of dosimetry and KI, and responders may need dosimetry and KI for a longer period of time than in traditional REP scenarios, further increasing the amount needed. ORO plans/procedures address planning for sufficient quantities of dosimetry and KI for augmented resources, including methods for estimating the number of potential responders needing supplies and equipment and expected loss due to consumption, malfunction, and misplacement. OROs may need to maintain additional supplies for an

HAB incident. Plans/procedures address how to obtain additional dosimetry and KI; who is responsible for procurement, stockpiling, and storage; and the maintenance of sufficient quantities of appropriate dosimetry – devices issued need to be able to detect and display the range of exposures for the particular responder (e.g., for the time they are expected at the scene and the amount of radiation to which they may be exposed).

Processes for dosimetry and KI distribution and training. Additional responders augmenting ORO resources will need instruction on the location and use of supplies and equipment. OROs coordinate/communicate plans/procedures with the licensee to identify responsibilities and processes for the issuance of dosimetry and KI to emergency workers responding onsite, specifically during an HAB incident. ORO plans/procedures also describe where and how dosimetry and KI will be distributed, and where and how emergency workers will be trained on its use, including just-in-time training.

Dose limits and authorizations to exceed limits. Some dose limits for certain specialized emergency workers are not high enough to allow responders in an HAB incident to be able to continue working in the area without seeking authorization to exceed these limits, which may be time consuming. Plans/procedures address a methodology for quick authorizations to exceed administrative dose limits to ensure a prompt, coordinated response to the NPP site to support critical life-saving, law enforcement, and accident mitigation activities. OROs document all authorizations to exceed administrative dose limits.

Consistency in processes and authorizations. Because more responders from different organizations (e.g., licensee, OROs, other jurisdictions, Federal Government) will be carrying out similar functions in the same location, organizations need to coordinate/communicate on consistency in worker exposure limits and processes for equipment distribution and use.

REFERENCES

- American National Standards Institute, Standard N13.11-2009, *Personal Dosimetry Performance Criteria for Testing.*
- FEMA-REP-2, Revision 2, *Guidance on Offsite Emergency Radiation Measurement Systems, Phase 1 – Airborne Release*, June 1990.
- EPA-400-R-92-001, *Manual of Protective Action Guides and Protective Actions for Nuclear Incidents*, May 1992.
- Nuclear Regulatory Commission (NRC), Regulatory Issue Summary (RIS) 2002-21, *National Guard and Other Emergency Responders Located in the Licensee's Controlled Area*, November 8, 2002.
- *National Incident Management System*, December 2008.
- *Comprehensive Preparedness Guide 101: Developing and Maintaining State, Territorial, Tribal, and Local Government Emergency Plans*, Version 2, November 2010.

NUREG CRITERION K.3.b

Each organization shall ensure that dosimeters are read at appropriate frequencies and provide for maintaining dose records for emergency workers involved in any nuclear accident.

Applicability and Cross-Reference to Plans: Licensee X State X Local X

TO MEET THE INTENT OF CRITERION K.3.b, ORO PLANS/PROCEDURES SHALL INDICATE:

- ✓ The method for obtaining dose information from emergency workers;
- ✓ The timeframes for reading dosimeters (e.g., every 15 or 30 minutes);
- ✓ The methods for recording doses (e.g., the form used); and
- ✓ Appropriate reporting if administrative limits have been reached or exceeded (refer to Criterion K.4.).

EXPLANATION

The plans/procedures state that DRDs are read at regular intervals to determine whether emergency workers have been exposed to radiation. All emergency workers periodically read their dosimeters, record each reading, and note any exposure

indicated (including no exposure) on a record card or form provided with the dosimeters. When a specific exposure has occurred, the emergency worker must inform the radiological health officer or other supervisor, particularly if the dose limits for the mission have been reached or exceeded. The details of these procedures may vary from one State to another. However, the plans/procedures are consistent from location to location, and site to site, within a State. It also is important that each plan/procedure has prescribed intervals for reading and recording exposure to radiation. The plans/procedures specify the methods for recharging low-range DRDs if recharging is necessary to support reporting of any administrative limits placed on dose. The plans/procedures describe how emergency workers will be informed of the requirement to read, record, and report dosimeter values.

REFERENCES

- FEMA-REP-2, Revision 2, *Guidance on Offsite Emergency Radiation Measurement Systems, Phase 1 – Airborne Release*, June 1990.
- EPA-400-R-92-001, *Manual of Protective Action Guides and Protective Actions for Nuclear Incidents*, May 1992.
- *National Incident Management System*, December 2008.
- *National Response Framework, Nuclear/Radiological Incident Annex*, June 2008.
- *Comprehensive Preparedness Guide 101: Developing and Maintaining State, Territorial, Tribal, and Local Government Emergency Plans*, Version 2, November 2010.

NUREG CRITERION K.4

Each State and local organization shall establish the decision chain for authorizing emergency workers to incur exposures in excess of the EPA General Public Protective Action Guides (i.e., EPA PAGs for emergency workers and lifesaving activities).

Applicability and Cross-Reference to Plans: Licensee __ State X Local X

TO MEET THE INTENT OF CRITERION K.4, ORO PLANS/PROCEDURES SHALL SPECIFY:

- ✓ Dose limits (TEDE) for missions, accounting for dose from inhalation;
- ✓ Actions taken when exposure limits have been reached;
- ✓ Any special conditions requiring additional limitations (e.g., pregnant emergency workers);
- ✓ Authorization to exceed pre-authorized exposure limits and management of emergency workers' exposure above the limits;
- ✓ Points of contact for authorization to remain in the hazard area and receive additional exposure (e.g., for special lifesaving missions) if the allowable upper limit has been reached;
- ✓ Information on risk and threshold doses for health effects to be provided to emergency workers volunteering for higher dose exposure; and
- ✓ Administrative limits.

EXPLANATION

During response to a radiological emergency, emergency workers may be at risk of incurring radiation exposure beyond the EPA General Public PAG. To protect the health and safety of emergency workers, ORO plans/procedures ensure that such excess exposures are undertaken only as authorized and controlled by supervisory personnel.

As noted in Evaluation Criterion K.3.a., EPA-400-R-92-001 provides guidance on emergency worker exposure control in terms of TEDE, which includes the deep-dose equivalent from external gamma radiation and committed effective dose equivalent from exposure to internal organs caused by inhalation of airborne radioactive materials during an emergency. Plans/procedures include all applicable limits (e.g., administrative, turn-back, general emergency assignments, protecting

valuable property, life-saving or protecting large populations, protecting pregnant women and unborn children). The dose limit is 5 rem TEDE, unless circumstances warrant a higher limit. If 5 rem TEDE is not a practical limit, a limit up to 10 rem TEDE may be selected for protection of valuable property, and up to 25 rem TEDE for life-saving activities or protection of large population groups. The plans/procedures address the assignment of these limits for emergency work. Doses higher than 25 rem TEDE may be voluntarily accepted by emergency workers who are fully aware of the health risks, including the numerical estimates of dose at which acute effects of radiation may be incurred and the risk of delayed effects from radiation dose.

The plans/procedures include or reference the *Dose Limits for Emergency Workers* table found in EPA 400-R-92-001. The plans/procedures also reference or include procedures that will be used for authorizing emergency workers to volunteer for doses higher than the dose limits specified in the plans/procedures, as well as procedures and the source of information for briefing volunteers on the radiation risks involved. In addition, the plans/procedures clearly state that the dose to emergency workers is treated as an once-in-a-lifetime exposure and is not added to occupational radiation exposure accumulated under non-emergency conditions. For individuals who volunteer to receive doses in excess of the stated limits, the plans/procedures also include a description of the full reporting and decision chain process from the emergency worker through the final authorizing person and back to the emergency worker.

As in the case of normal occupational exposure, doses received under emergency conditions are minimized to the extent practicable (e.g., use of KI, where appropriate; limiting time spent working in radiation areas; rotating available emergency workers). The organization indicates methods to ensure protection of minors and the unborn during emergencies. Therefore, pregnant women or individuals under age 18 do not perform emergency services in an area where radiation exposure is expected.

REFERENCES

- FEMA-REP-2, Revision 2, *Guidance on Offsite Emergency Radiation Measurement Systems, Phase 1 – Airborne Release*, June 1990.
- EPA-400-R-92-001, *Manual of Protective Action Guides and Protective Actions for Nuclear Incidents*, May 1992.
- *National Incident Management System*, December 2008.
- *National Response Framework, Nuclear/Radiological Incident Annex*, June 2008.
- *Comprehensive Preparedness Guide 101: Developing and Maintaining State, Territorial, Tribal, and Local Government Emergency Plans*, Version 2, November 2010.

NUREG CRITERION K.5.a

Each organization as appropriate, shall specify action levels for determining the need for decontamination.

Applicability and Cross-Reference to Plans: Licensee X State X Local X

TO MEET THE INTENT OF CRITERION K.5.a, ORO PLANS/PROCEDURES SHALL DESCRIBE:

- ✓ Facilities for monitoring and decontaminating emergency workers, equipment, and vehicles, along with operating and implementing procedures;
- ✓ Locations of monitoring and decontamination facilities (preferably located outside the plume EPZ);
- ✓ Methods for controlling the spread of contamination at the emergency worker monitoring facilities;
- ✓ Radioactive contamination levels that will trigger decontamination of emergency workers, equipment, and vehicles, expressed in applicable units (e.g., cpm, mR/hr);
- ✓ Survey instruments (i.e., specific appropriate equipment and sensitivity, including radiation type) used to monitor emergency workers, equipment, and vehicles; and
- ✓ Procedures for monitoring individuals and equipment.

EXPLANATION

Because emergency workers may be working in areas where they could become contaminated with radioactive materials, plans/procedures describe the capability to activate and operate facilities for monitoring and decontaminating emergency workers, equipment, and vehicles. The plans/procedures describe the facilities for monitoring and decontamination, including methods, supplies, and equipment to minimize contamination (e.g., protective coverings or instructional signs). The plans/procedures also describe trained staff available to perform monitoring and decontamination. Monitoring instruments provide reasonable assurance that the risk of skin cancer and other significant radiation effects to the skin of people exposed to radioactive contamination does not exceed the guidelines for risk of health effects established by EPA.

Monitoring equipment checks: Monitoring procedures include the types of monitoring equipment to be used, how operational checks will be conducted, and how people and equipment will be monitored. OROs conduct operational checks according to the procedures and guidance in the explanation under Criterion H.10. For a hand-held monitor with a probe, these may include checking the batteries and measuring its response to radiation from an accompanying radioactive check source. For a portal monitor, the procedure involves turning the instrument on, checking for power indication, operating and observing any check circuits, and counting the check source according to procedures for source location and counting time. The plans/procedures indicate that the portal monitors will meet requirements contained in FEMA-REP-21.

Monitoring procedures: The plans/procedures also describe the procedures for monitoring people using either portal monitors or portable instruments. Portable survey instruments have earphones or speakers and a covered detector/probe (e.g., covered with plastic wrap that is thin, transparent, fits tightly, and can be easily replaced if it becomes contaminated). Experience has shown that one or two layers of plastic wrap will not significantly shield the beta radiation from the detector. If the detector/probe is not covered, extra detectors need to be available to replace those that become contaminated.

For portable instruments, the beta shield on the detector remains open and facing the contaminated surface and is moved over the entire body of the individual, close to the surface, and at a relatively slow speed. These factors vary, depending on the type of instrument and detector used, and are clearly described in the appropriate procedures.[59]

Portal monitors are used for individuals standing inside or passing through the monitoring framework for a specified period of time, while the instrument integrates the amount of radiation detected. The duration of the integration depends on the type of portal monitor, background radiation in the area, and the minimum detection level setting.

Vehicles and equipment: Plans/procedures also address monitoring emergency worker equipment and vehicles. It generally is not necessary to monitor the entire surface of vehicles. At a minimum, areas such as the front bumper, radiator grill, wheel wells, and door handles are monitored. If elevated readings are observed in the hood area, it is possible that the air filter, which is located in the engine compartment, is contaminated. In such cases, the plans/procedures provide for trigger/action levels. Because emergency workers may be working in areas where they (and their equipment and vehicles) could become contaminated, interior surfaces including the driver's seat, steering wheel, and gas and brake pedals are monitored. The passenger side floor and seat is monitored if persons who rode in the vehicle were found to be contaminated or if otherwise deemed appropriate. Any area where emergency equipment was placed, such as a trunk or deck area, and all equipment taken into the plume EPZ, including paper forms and other spare supplies, is monitored.

Regardless of manufacturer claims, there are challenges to using portal monitors on vehicles. However, portal monitors may be used on portions of vehicles if the user can demonstrate the sensitivity of the instrument to the standards described in FEMA REP-22. If the 0.0085 μCi/cm2 can be detected on certain portions of the vehicle, a portal monitor may be used in tandem with a hand-held monitor. It is the responsibility of the user to demonstrate the detection sensitivity of the portal monitor in the scanned zone using the planned monitoring technique. Some areas of the vehicle, such as the grill and roof, may still need to be monitored by hand. The interior of a vehicle will still need to be monitored by hand.

[59] For further guidance, see *Contamination Monitoring Guidance for Portable Instruments Used for Radiological Emergency Response to Nuclear Power Plant Accidents*, FEMA-REP-22, October 2002.

Trigger/action levels: Organizations include in their plans/procedures the decision criteria that indicate a need to decontaminate emergency workers, equipment, and vehicles. The instruments ordinarily used for determining contamination levels are count rate meters employing G-M detectors. Therefore, the decision criterion is usually given in counts per minute (cpm). The plans/procedures specify trigger/action levels, although they may change depending on the detection instruments used.

REFERENCES

- FEMA-REP-2, Revision 2, *Guidance on Offsite Emergency Radiation Measurement Systems, Phase 1 – Airborne Release*, June 1990.
- FEMA-REP-21, *Contamination Monitoring Standard for a Portal Monitor Used for Radiological Emergency Response*, March 1995.
- EPA-400-R-92-001, *Manual of Protective Action Guides and Protective Actions for Nuclear Incidents*, May 1992.
- FEMA-REP-22, *Contamination Monitoring Guidance for Portable Instruments Used for Radiological Emergency Response to Nuclear Power Plant Accidents*, October 2002.
- *National Incident Management System*, December 2008.
- *National Response Framework, Nuclear/Radiological Incident Annex*, June 2008.
- *Comprehensive Preparedness Guide 101: Developing and Maintaining State, Territorial, Tribal, and Local Government Emergency Plans*, Version 2, November 2010.

NUREG CRITERION K.5.b

Each organization, as appropriate, shall establish the means for radiological decontamination of emergency personnel wounds, supplies, instruments and equipment, and for waste disposal.

Applicability and Cross-Reference to Plans: Licensee X State X Local X

TO MEET THE INTENT OF CRITERION K.5.b, ORO PLANS/PROCEDURES SHALL ADDRESS:

- ✓ Supplies and equipment for decontamination;
- ✓ Decontaminating people, equipment, and vehicles;
- ✓ Re-monitoring people, equipment, and vehicles and recording the results;
- ✓ Criteria for sending individuals with fixed contamination for medical attention;
- ✓ Controlling the spread of contamination;
- ✓ Number of people needed to perform decontamination in the event of an emergency; and
- ✓ Contaminated waste collection, handling, and storage.

EXPLANATION

Facilities for decontaminating emergency workers and their equipment may be either collocated with or located separately from decontamination facilities for the general public. The plans/procedures include information on the following items.

a. Facility Locations

The plans/procedures indicate the location of emergency worker decontamination facilities. These are located outside the plume EPZ, if possible. Facilities consist of a structure containing the necessary equipment and supplies and an open area for monitoring and decontamination of vehicles and equipment. The facilities include separate showers for men and women. The facility has sufficient parking space to separate contaminated and uncontaminated vehicles and equipment. The plans/procedures include the facility street address and physical layout, including diagrams showing the flow of individuals and vehicles through the facility. Plans/procedures describe provisions for storage of contaminated clothing and other personal

items, including: (1) procedures to avoid raising the background gamma exposure rate significantly in the monitoring area; (2) the location for initial waste storage; and (3) demarcation and security for storage areas.

b. Procedures for Detected Contamination

Plans/procedures describe the process for recording contamination and exposure of emergency workers as well as procedures for isolating contaminated vehicles and equipment, if necessary. The plans/procedures also describe the individual, by title/position, responsible for disposing of or storing contaminated wastes, both initial and intermediate storage; the security measures to protect the waste from being mishandled; and the means for disposal and/or storage.

c. Decontamination

The plans/procedures describe decontamination procedures for emergency workers, equipment, and vehicles. Generally decontamination supplies available at the emergency worker decontamination center include, at a minimum, sinks and showers with soap and water, wash cloths, towels, and changes of clothing.

Decontamination of equipment and vehicles may include: (1) use of vacuum cleaners, preferably with high-efficiency particulate filters; (2) scrubbing contaminated areas with soap and water; (3) copiously applying low-pressure water and soap solutions to affected areas; and (4) applying organic solvents on greasy or waxed surfaces.

The plans/procedures provide for the re-monitoring of individuals, vehicles, and equipment after decontamination. The plans/procedures specify the number of decontamination attempts to be made before an individual is sent to a medical facility for more intensive decontamination, and identify the medical facilities that will receive individuals who are still contaminated. Procedures for dealing with equipment and vehicles that cannot be adequately decontaminated are also described.

The plans/procedures provide for collecting, handling, and storing contaminated wastes. Waste handling procedures address all types of anticipated contaminated wastes, including clothing, equipment, decontamination supplies, etc. OROs do not need to collect waste water from decontamination operations.

d. Contamination Control

The plans/procedures describe contamination control procedures (e.g., floor coverings, personal protective equipment worn by emergency workers) for each facility, including the means for separating contaminated individuals from those who have not been monitored or those found to be uncontaminated.

REFERENCES

- FEMA Policy Statement, *Policy Statement on Disposal of Waste Water and Contaminated Products from Decontamination Activities*, January 1989.
- FEMA-REP-2, Revision 2, *Guidance on Offsite Emergency Radiation Measurement Systems, Phase 1 – Airborne Release*, June 1990.
- FEMA-REP-21, *Contamination Monitoring Standard for a Portal Monitor Used for Radiological Emergency Response*, March 1995.
- EPA-400-R-92-001, *Manual of Protective Action Guides and Protective Actions for Nuclear Incidents*, May 1992.
- FEMA-REP-22, *Contamination Monitoring Guidance for Portable Instruments Used for Radiological Emergency Response to Nuclear Power Plant Accidents*, October 2002.
- *National Incident Management System*, December 2008.
- *National Response Framework, Nuclear/Radiological Incident Annex*, June 2008.
- *Comprehensive Preparedness Guide 101: Developing and Maintaining State, Territorial, Tribal, and Local Government Emergency Plans*, Version 2, November 2010.

NUREG CRITERION K.6

Each licensee shall provide onsite contamination control measures including:

a. area access control;

b. drinking water and food supplies;

c. criteria for permitting return of areas and items to normal use, see EPA-400-R-92-001.[60]

Applicability and Cross-Reference to Plans: Licensee _X_ State __ Local __

NUREG CRITERION K.7

Each licensee shall provide the capability for decontaminating relocated onsite personnel, including provisions for extra clothing and decontaminants suitable for the type of contamination expected, with particular attention given to radioiodine contamination of the skin.

Applicability and Cross-Reference to Plans: Licensee _X_ State __ Local __

[60] Original reference to Draft ANSI 13.12 replaced with EPA-400-R-92-001 per NUREG-0654/FEMA-REP-1, Revision 1, *Addenda*, March 2002.

12. Planning Standard L – Medical and Public Health Support

Arrangements are made for medical services for contaminated injured individuals.[61]

NUREG CRITERION L.1

Each organization shall arrange for local and backup hospital and medical services having the capability for evaluation of radiation exposure and uptake, including assurance that persons providing these services are adequately prepared to handle contaminated individuals.

Applicability and Cross-Reference to Plans: Licensee X State X Local X

TO MEET THE INTENT OF CRITERION L.1, ORO PLANS/PROCEDURES SHALL:

- ✓ Reference written agreements or LOAs with hospitals/medical facilities.
- ✓ Reference written agreements or LOAs for technical staff that are not employed by the hospital/medical facility.
- ✓ Include individual facility capabilities, including the number of radiologically trained medical personnel and support staff.
- ✓ Describe hospital/medical facility and support service operations for treating contaminated, injured, or exposed individuals.
- ✓ Describe dosimetry procedures, including record keeping and final receipt for processing.

EXPLANATION

This criterion refers to arranging medical care for the general public. Medical care for members of the licensee's utility staff is addressed in Criterion B.9. One primary local hospital/medical facility and one backup facility for each site are designated for the evaluation and emergency treatment of contaminated injured members of the general public. The primary and backup hospitals/medical facilities for the public may be the same as those for the utility employees and emergency workers.

Provider location: FEMA prefers that both the primary and backup facilities and attendant emergency medical transportation services (this does not include normal EMS providers) are located at least 5 miles and preferably 10 miles beyond the boundaries of the plume exposure pathway EPZ. FEMA recognizes that OROs may not be able to locate both the primary and backup hospital/medical facility at those distances. Therefore, at least one of the medical facilities and one attendant emergency medical transportation services provider are located at least 5 miles outside the plume exposure pathway EPZ.

Letters of agreement: OROs obtain written agreements from the hospitals/medical facilities, medical transportation providers, and technical staff (i.e., not employed or contracted by the hospital/medical facility including health physicists, radiological control technicians, etc.) and include the agreements in the plans/procedures. Criterion L.4 discusses more details regarding LOAs for medical transportation providers. The written agreements contain assurances that the providers have adequate technical information (e.g., treatment protocols) and treatment capabilities for handling contaminated, injured, or exposed individuals. If OROs do not obtain written agreements, the licensee obtains the agreements with the listed hospitals/medical facilities, medical transportation providers, and technical staff. If good faith efforts are not successful in a particular case, the licensee provides or arranges for adequate compensatory measures (e.g., obtain written agreements with other providers or provide temporary field medical care).

LOAs state the hospital/medical facility name; location of facility; type of capabilities; and approximate number of contaminated, injured, or exposed patients who can be treated.

[61] The availability of an integrated emergency medical services system and a public health emergency plan serving the area in which the NPP is located and, as a minimum, equivalent to the *Public Health Service Guide for Developing Health Disaster Plans* (1974) and to the requirements of an emergency medical services system as outlined in the *Emergency Medical Services System Act of 1973* (PL 93-154 and amendments in the 1979 PL 96-142) should be a part of and consistent with overall ORO disaster control plans/procedures and should be compatible with the specific overall emergency response for the NPP.

Staff specifications: Primary and backup facility capabilities are addressed in separate hospital/medical facility plans/procedures. The plans/procedures identify those individuals, by title/position, who are in charge of coordinating this program, as well as the number of radiologically trained medical personnel available. Hospitals/medical facilities have at least one physician and one nurse capable of supervising the evaluation and treatment of contaminated, injured, or exposed patients. The plans/procedures specify that a physician will be present or readily available at all times during operation of the Radiation Emergency Area.[62] Hospital/medical facility plans/procedures include or reference listings of such staff. Although not required, a health physics technician or medical physicist should be available to assist the medical staff.

Plans/procedures identify, by title/position, the person who will monitor individuals to determine the nature and extent of radiological contamination. Licensee personnel, health physics technicians, trained hospital personnel, or members of the transport crew (see Criterion L.4) may perform monitoring. If licensee personnel will perform radiological monitoring and contamination control for contaminated, injured, or exposed individuals, plans/procedures document these arrangements and reference supporting written agreements.

Facility procedures: Hospital/medical facility plans/procedures describe the following:

- Maximum number of contaminated, injured, or exposed patients who could be treated at one time;
- Contingencies in place if the number of patients needing treatment exceeds capacity;
- Approximate response time needed to establish controlled areas and assemble and fully prepare the necessary medical/radiological staff;
- Details of notification, including information that the hospital/medical facility would receive regarding the incident and patients;
- Staff who would be mobilized and their responsibilities;
- Communication methods, particularly for emergency vehicles en route;
- Routes for incoming emergency vehicles;
- List of equipment available, including personal protective equipment (e.g., gloves, booties);
- Preparation of the decontamination area, including floor coverings, filtered ventilation systems, and appropriate radiation warning signs;
- Diagram of the treatment and decontamination area, including a buffer zone separating the Radioactive Emergency Area from the rest of the facility;
- Monitoring and decontaminating patients, including controlling contamination, disposing of contaminated waste, and re-monitoring after decontamination; and
- An example of the system used to record patient data.

Staff dosimetry: In addition, hospital/medical facility plans/procedures contain the following information regarding staff dosimetry:

- How to obtain assigned dosimetry.
- The organization responsible for issuing dosimetry. This typically could be either the State/local emergency management agency or the utility if the hospital/medical facility provides care to both utility and government staff. In some cases, both parties issue dosimetry.
- The person, by title/position, or organization responsible for radiological monitoring and exposure recordkeeping and processing.
- The mechanism for obtaining exposure records in special cases where dosimetry is not issued by the organization responsible for final record keeping.

[62] A Radiation Emergency Area is an area in a medical facility for monitoring, decontamination, and treatment of contaminated injured individuals, and for contamination control.

REFERENCES

- Emergency Medical Services (EMS) System Act of 1973 (PL 93-154 and amendments in the 1979 PL 96-142).
- *Public Health Service Guide for Developing Health Disaster Plans*, 1974.
- *National Incident Management System*, December 2008.
- *Comprehensive Preparedness Guide 101: Developing and Maintaining State, Territorial, Tribal, and Local Government Emergency Plans*, Version 2, November 2010.

NUREG CRITERION L.2

Each licensee shall provide for onsite first aid capability.

Applicability and Cross-Reference to Plans: Licensee X State __ Local __

NUREG CRITERION L.3

Each State shall develop lists indicating the location of public, private and military hospitals and other emergency medical services facilities within the State or contiguous States considered capable of providing medical support for any contaminated injured individual. The listing shall include the name, location, type of facility and capacity, and any special radiological capabilities. These emergency medical services should be able to radiologically monitor contamination personnel, and have facilities and trained personnel able to care for contaminated injured persons.

Applicability and Cross-Reference to Plans: Licensee __ State X Local __

TO MEET THE INTENT OF CRITERION L.3, ORO PLANS/PROCEDURES SHALL INCLUDE:

- ✓ Lists of additional hospitals/medical facilities capable of providing medical support for contaminated, injured, or exposed individuals.

EXPLANATION

The explanation for Evaluation Criterion L.1 addresses the need for establishing designated primary and backup hospital/medical facilities for treatment of contaminated injured individuals. Evaluation Criterion L.3 describes information for *additional* hospitals/medical facilities in the area that would be available to assist with overflow from the designated primary and backup facilities. This list will enable ORO officials to direct the public to those institutions capable of handling contaminated, injured, or exposed patients. This list includes the following for each facility:

- Name.
- Location.
- Type (i.e., public, private, or military hospital, or other type of medical facility).
- Capacity for ambulatory and non-ambulatory patients. Ambulatory capacity means the hospital/medical facility's capacity to treat individuals as outpatients – or the number of individuals that the facility can handle per day for treatment of radiological contamination or exposure without regard to hospitalization. Non-ambulatory capacity refers to the facility's inpatient capacity, or the total number of available beds without regard to treatment of radiological contamination or exposure.
- Any special radiological capabilities (e.g., specific radiologically trained staff such as health or medical physicist), the types of monitoring equipment available, and the facility's capabilities for analyzing samples for internal and external contamination.

Plans/procedures provide this information in the form of a matrix or list and include it in an appendix listing resources.

REFERENCES

- *National Incident Management System*, December 2008.
- *Comprehensive Preparedness Guide 101: Developing and Maintaining State, Territorial, Tribal, and Local Government Emergency Plans*, Version 2, November 2010.

NUREG CRITERION L.4

Each organization shall arrange for transporting victims of radiological accidents to medical support facilities.

Applicability and Cross-Reference to Plans: Licensee X State X Local X

TO MEET THE INTENT OF CRITERION L.4, ORO PLANS/PROCEDURES SHALL DESCRIBE:

- ✓ The method for determining an appropriate hospital/medical facility and the person, by title/position, responsible for the determination;
- ✓ Means of transporting individuals, including how to request additional emergency medical services;
- ✓ Communications between the transport crew and hospital/medical facility staff;
- ✓ Specifics of radiological monitoring;
- ✓ Contamination control measures during transport;
- ✓ Decontamination techniques, including trigger/action levels;
- ✓ Dosimetry for the transport crew; and
- ✓ LOAs with transportation providers (see Criterion A.3).

EXPLANATION

Transporting radiologically contaminated, injured, or exposed individuals involves more than moving an individual from the incident scene to a hospital/medical facility. Plans/procedures include procedures and LOAs from transportation providers. LOAs include the name of the organization, type of services provided, and maximum number of vehicles that can be provided.

Plans/procedures address the vehicles, equipment, procedures, and personnel needed for medical transportation support. For patients with urgent medical conditions, the plans/procedures establish priorities between addressing radioactive contamination and the need for prompt transportation to a medical facility. The following topics are included in this discussion.

a. Appropriate Medical Facility

Plans/procedures identify the person responsible, by title/position, for arranging transportation to the appropriate hospital/medical facility for contaminated, injured, or exposed individuals. Plans/procedures include the process for selecting a facility based on the extent of contamination and nature of the injuries. Individuals with urgent medical conditions (e.g., heart attack, serious injury) are transported directly to the nearest facility regardless of the radioactive plume conditions.

b. Transport of Individuals

Two factors are considered in determining the appropriate type of vehicle to transport contaminated, injured, or exposed individuals to a hospital/medical facility: (1) the type and severity of the medical problems encountered; and (2) the need for trained emergency medical services personnel. The early symptoms of exposure to high levels of radiation may be limited to nausea and vomiting. In these cases, non-specialized vehicles (e.g., auto, van, bus) may be used. When more severe symptoms or injuries are present, emergency workers use specialized vehicles (e.g., ambulance, med evac, or critical

care unit). Use of these resources is supported by written agreements. Plans/procedures for transportation providers include the process for making this decision and requesting additional emergency medical services.

c. Maintaining Communications

Plans/procedures describe the process for communicating with transport crews when transporting an individual to a hospital/medical facility. These procedures ensure that vehicle crews maintain communication with the hospital/medical facility to allow for advance preparations for treatment. Procedures identify the person responsible, by title/position, for receiving notification from the transport crew and notifying Radioactive Emergency Area staff to begin setup. Procedures include a list of information that is provided to the receiving hospital/medical facility (e.g., data on the individual's physical condition, vital signs, type of radiological contamination, and estimated time of arrival).

d. Monitoring of Individuals

Plans/procedures identify the person responsible, by title/position, for monitoring an individual to determine the nature and extent of external radiological contamination. Licensee personnel, health physics technicians, trained hospital personnel, or members of the transport crew may perform monitoring. If plans/procedures state that licensee personnel will perform radiological monitoring and contamination control functions during transportation of contaminated, injured, or exposed individuals, LOAs support these arrangements.

Plans/procedures also describe monitoring processes, whether performed in the field prior to transport or immediately upon arrival at the hospital/medical facility. If individual monitoring is deferred to the facility, plans/procedures state that transport crews assume the individual is contaminated and employ appropriate contamination control measures. Plans/procedures also describe use of monitoring equipment (e.g., type of instrumentation, required labeling, calibration, and responsiveness to an identified check source, use of earphones or a speaker to allow the individual using the monitor to focus on correctly positioning the survey instrument probe rather than reading the monitor).

e. Contamination Control Measures

Plans/procedures describe contamination control measures during transport of contaminated, injured, or exposed individuals. Examples of contamination control measures include using gloves to prevent the spread of contamination, lining the patient area of the vehicle with a protective covering or wrapping the patient in a sheet or blanket, and covering the survey instrument probe with thin plastic to minimize contamination. Because these actions are only for controlling the spread of contamination and will not protect the patient or attendants from radiation, contamination control efforts do not hinder or delay medical care for the patient.

f. Decontamination Measures

Plans/procedures describe decontamination processes and provide trigger/action levels for the vehicle and crew if they are found to be contaminated upon arrival at the hospital/medical facility. Trigger/action levels correspond to the radiological monitoring equipment being used. The plans/procedures state where decontamination would take place.

g. Dosimetry

Plans/procedures identify the organization (e.g., State/local emergency management agency) responsible for issuing dosimetry and describe how the transport crew would obtain their dosimetry.

REFERENCES

- *National Incident Management System*, December 2008.
- *Comprehensive Preparedness Guide 101: Developing and Maintaining State, Territorial, Tribal, and Local Government Emergency Plans*, Version 2, November 2010.

13. Planning Standard M – Recovery and Reentry Planning and Post-Accident Operations

General plans for recovery and reentry are developed.

NUREG CRITERION M.1

Each organization, as appropriate, shall develop general plans and procedures for reentry and recovery and describe the means by which decisions to relax protective measures (e.g., allow reentry into an evacuated area) are reached. This process should consider both existing and potential conditions.

Applicability and Cross-Reference to Plans: Licensee X State X Local X

TO MEET THE INTENT OF CRITERION M.1, ORO PLANS/PROCEDURES SHALL DESCRIBE ACTIONS DURING INTERMEDIATE AND LATE PHASES OF AN INCIDENT, INCLUDING:

- ✓ Continuing environmental radiation measurements and dose assessments;
- ✓ Establishing restricted and buffer zones;
- ✓ Relocation;
- ✓ Controlled reentry into restricted areas;
- ✓ Return of the public to previously evacuated areas; and
- ✓ Recovery, including a list of actions that may be needed and organizations responsible for carrying them out.

EXPLANATION

At the time NUREG-0654/FEMA-REP-1 was published, "recovery and reentry" was used as a general term referring to activities that occur after the initial phase of an emergency. Since then, revised EPA PAGs[63] have described three phases of an incident:

- **Early phase** – initial response and protective actions. This phase is also called the plume or emergency phase.
- **Intermediate phase** – continuing response and protective actions to protect the public from deposited radioactivity. This phase includes ingestion and relocation activities.
- **Late phase** – return and recovery.

This criterion addresses the post-plume activities of the intermediate and late phases. Under updated guidelines, post-plume actions address the following topics:

a. Relocation

Some people or households may need to be removed from contaminated areas, perhaps permanently, to avoid chronic radiation exposure. Plans/procedures describe how to relocate individuals after an incident and outline the organization's responsibilities, including decision making, notification, and provision of physical and/or economic assistance.

b. Reentry

Reentry can occur during the plume or post-plume phase. This criterion addresses post-plume reentry. Certain individuals who have been evacuated or relocated from a restricted zone may be allowed to reenter under controlled conditions to perform additional emergency response activities or carry out specific types of personal business. For example, farmers may be permitted to reenter to provide essential care for livestock. Plans/procedures include information on the types of reentry permitted and under what conditions they would be permitted. Some conditions include: (1) use of access control points

[63] See *Manual of Protective Action Guides and Protective Actions for Nuclear Incidents*, EPA 400-R-92-001 (May 1992).

to issue dosimetry and train reentering individuals on its use; (2) use of stay times (as used here, the amount of time a person can safely stay in a restricted zone without exceeding their exposure limit), depending on the location of the reentry destination; (3) use of a health physicist escort or other personnel escort trained in the use of dosimetry; and (4) provision of monitoring and decontamination for exiting individuals.

c. Return

Previously evacuated persons are permitted to return to areas cleared for unrestricted residence. Evacuated areas must be below radiation protection criteria for relocation before the evacuated or relocated persons are allowed to return to their homes and businesses. The plans/procedures describe the processes for determining which areas are cleared and include the organizations responsible for testing and certifying that an area is safe for return.

d. Recovery

The term "recovery" refers to the process of reducing radiation exposure rates and concentrations of radioactive material in the environment to levels safe enough for the public to return to an area for unconditional occupancy or use after the initial phase of the radiological emergency. In areas where deposition occurred, procedures to reduce or remove the radioactive materials may need to be developed. The plans/procedures include information on the organizations responsible for determining the need for and carrying out such cleanup operations.

Assessment of an incident will continue during the intermediate and late phases. Activities will include: (1) air and soil sampling and analysis; (2) dose assessment and projection; and (3) establishing restricted zone(s) and buffer zone(s). It will be necessary to develop procedures to protect persons who live in or use areas contaminated at levels below the dose for relocation. It will also be necessary to establish controls for reentry, as described above under *Reentry*. All procedures to support relocation and return decisions will be based on a comparison of EPA PAGs to the potential long-term dose to the public from materials deposited after an incident.

REFERENCES

- EPA-400-R-92-001, *Manual of Protective Action Guides and Protective Actions for Nuclear Incidents*, May 1992.
- *National Incident Management System*, December 2008.
- *National Response Framework, Nuclear/Radiological Incident Annex*, June 2008.
- *Comprehensive Preparedness Guide 101: Developing and Maintaining State, Territorial, Tribal, and Local Government Emergency Plans*, Version 2, November 2010.

NUREG CRITERION M.2

Each licensee plan shall contain the position/title, authority, and responsibilities of individuals who will fill key positions in the facility recovery organization. This organization shall include technical personnel with responsibilities to develop, evaluate, and direct recovery and reentry operations. The recovery organization recommended by Functional Criteria for Emergency Response Facilities, NUREG-0696 (February 1981) and Clarification of TMI Action Plan Requirements, Requirements for Emergency Response Capability, NUREG-0737, Supplement 1 (January 1983),[64] is an acceptable framework.

Applicability and Cross-Reference to Plans: Licensee _X_ State __ Local __

[64] Original reference to *The Atomic Industrial Forum's Nuclear Power Plant Emergency Response Plan* (October 11, 1979) has been superseded by the above two documents per NUREG-0654/FEMA-REP-1, Revision 1, *Addenda*, dated March 2002.

NUREG CRITERION M.3

Each licensee and State plan shall specify means for informing members of the response organizations that a recovery operation is to be initiated, and of any changes in the organizational structure that may occur.

Applicability and Cross-Reference to Plans: Licensee X State X Local _[65]_

TO MEET THE INTENT OF CRITERION M.3, ORO PLANS/PROCEDURES SHALL INDICATE:

- ✓ Means used to keep all involved response organizations (e.g., OROs with affected populations and/or areas) informed of recovery phase plans/procedures being developed, such as remedial measures, how long they will take, and what final outcome is expected; and
- ✓ Changes that might take place in the organizational structure (e.g., the Governor being in charge under a "state of emergency" that may then revert to a new or other authority).

EXPLANATION

Plans/procedures include information on the means for keeping all response organizations informed of procedures developed and actions to be taken during the intermediate and late phases of an incident.

REFERENCES

- EPA-400-R-92-001, *Manual of Protective Action Guides and Protective Actions for Nuclear Incidents*, May 1992.
- *National Incident Management System*, December 2008.
- *National Response Framework*, second edition, May 2013.
- *National Response Framework, Nuclear/Radiological Incident Annex*, June 2008.
- *Comprehensive Preparedness Guide 101: Developing and Maintaining State, Territorial, Tribal, and Local Government Emergency Plans*, Version 2, November 2010.

NUREG CRITERION M.4

Each plan shall establish a method for periodically estimating total population exposure.

Applicability and Cross-Reference to Plans: Licensee X State X Local __

TO MEET THE INTENT OF CRITERION M.4, ORO PLANS/PROCEDURES SHALL:

- ✓ Identify agencies responsible for and involved in long-term dose assessment activities after an incident.

EXPLANATION

The purpose of this criterion is to provide a basis for an after-the-fact estimate of the health effects from the radiological incident. The plans/procedures include information about how the State will estimate total population exposure caused by the incident from all pathways. One or more Federal agencies usually perform the dose assessment process in coordination with State agencies.

[65] FEMA recognizes that, in some instances, this criterion applies to *local* response organizations.

REFERENCES

- EPA-400-R-92-001, *Manual of Protective Action Guides and Protective Actions for Nuclear Incidents*, May 1992.
- *National Incident Management System*, December 2008.
- *National Response Framework, Nuclear/Radiological Incident Annex*, June 2008.
- *Comprehensive Preparedness Guide 101: Developing and Maintaining State, Territorial, Tribal, and Local Government Emergency Plans*, Version 2, November 2010.

14. Planning Standard N – Exercises and Drills

Periodic exercises are (will be) conducted to evaluate major portions of emergency response capabilities, periodic drills are (will be) conducted to develop and maintain key skills, and deficiencies identified as a result of exercises or drills are (will be) corrected.

NUREG CRITERION N.1.a

An exercise is an event that tests the integrated capability and a major portion of the basic elements existing within emergency preparedness plans and organizations. Exercises shall be conducted as set forth in NRC and FEMA rules and policy.[66]

Applicability and Cross-Reference to Plans: Licensee X State X Local X

TO MEET THE INTENT OF CRITERION N.1.a, ORO PLANS/PROCEDURES SHALL INDICATE THAT:

✓ REP exercises will be conducted in accordance with NRC and FEMA rules and policy.

EXPLANATION

Once plans/procedures have been developed and staff is trained in response functions, exercises are conducted to demonstrate that response capabilities described in the plans/procedures can actually be implemented. Part III of this manual provides detailed information on exercise development, conduct, and documentation.

Through PPD-8, the President directed the establishment of the National Exercise Program to integrate national-level exercise activities. Key features of the HSEEP methodology include:

- Scheduling through the use of an annual Training and Exercise Planning Workshop (TEPW) and Multi-year Training and Exercise Plan (TEP);
- Planning and implementation in accordance with the guidelines set forth in HSEEP methodology;
- A properly formatted After-Action Report/Improvement Plan (AAR/IP); and
- Tracking and implementation of corrective actions identified in the AAR/IP.

In concert with the National Exercise Program, REP exercises will use the HSEEP methodology and guidance to align and standardize exercise program management, design, development, conduct, evaluation, and improvement planning. However, as discussed in more detail in Part III, HSEEP does not supersede existing NUREG-0654/FEMA-REP-1 requirements for the REP Program.

REFERENCES

- *Homeland Security Exercise and Evaluation Program (HSEEP)*, April 2013.
- *Comprehensive Preparedness Guide 101: Developing and Maintaining State, Territorial, Tribal, and Local Government Emergency Plans*, Version 2, November 2010.
- PPD-8 *National Preparedness*.
- FEMA Directive 123-15, January 16, 2009.

[66] This criterion amended per NUREG-0654/FEMA-REP-1, Supplement 4, (2011).

NUREG CRITERION N.1.b

An exercise shall demonstrate the key skills of response organizations to adequately respond to an incident scenario. The scenarios shall vary such that the major elements of emergency plans are exercised within an 8-year exercise cycle. Each scenario variation shall be demonstrated at least once during the 8-year exercise cycle and shall include, but not be limited to, the following:

a. Hostile action directed at the plant site involving the integration of offsite resources with onsite response;

b. An initial classification of or rapid escalation to a Site Area Emergency or General Emergency;

c. No radiological release or an unplanned minimal radiological release that requires the site to declare a Site Area Emergency, but does not require declaration of a General Emergency. For this scenario variation the following conditions shall apply:

i. The licensee is required to demonstrate the ability to respond to a no/minimal radiological release scenario at least once within the 8-year exercise cycle. State, Tribal and local response organizations have the option, and are encouraged, to participate jointly in this demonstration.

ii. When planning for a joint no/minimal radiological release exercise, affected State, Tribal and local jurisdictions, the licensee, and FEMA will identify offsite capabilities that may still need to be evaluated and agree upon appropriate alternative evaluation methods to satisfy FEMA's biennial criteria requirements. Alternative evaluation methods that could be considered during the extent of play negotiations include expansion of the exercise scenario, out of sequence activities, plan reviews, staff assistance visits or other means as described in FEMA guidance.

iii. If the offsite organizations elect not to participate in the licensee's required minimal or no-release exercise, they will still be obligated to meet the exercise requirements as specified in 44 CFR § 350.9.[67]

Applicability and Cross-Reference to Plans: Licensee X State X Local X

TO MEET THE INTENT OF CRITERION N.1.b, ORO PLANS/PROCEDURES SHALL INDICATE THAT:

- ✓ All major elements of the plans/procedures will be tested at minimum at the frequency specified by the REP Program Manual, Exhibit III-2; and
- ✓ Scenarios for exercises will be varied from exercise to exercise and include all required scenario variations during the exercise cycle.

EXPLANATION

This criterion addresses the use of exercises to demonstrate the capability of OROs to respond to an emergency involving a commercial NPP. Criterion N.1.b addresses frequency and scenario requirements for plume-phase exercises. Criterion N.1.d describes exercise requirements specific to ingestion-phase activities.

[67] This criterion amended per NUREG-0654/FEMA-REP-1, Supplement 4, (2011).

a. Exercise Frequency

State and local OROs must conduct joint full-participation exercises with the licensee biennially (i.e., every 2 years) in order to comply with the regulations in 44 CFR § 350.9(c). This applies to OROs that have an NPP within their boundaries or that lie wholly or partially within the 10-mile plume exposure EPZ of such a site. The current exercise cycle is 8 years and spans 4 biennial exercises.

This exercise cycle is based on the date of the first joint Hostile Action Based scenario exercise conducted after December 23, 2011 (the effective date of this manual).

Partial participation: The regulatory provisions give OROs with responsibilities to multiple NPPs flexibility to partially participate in some biennial exercises. States with multiple sites may rotate their full participation among the sites (i.e., when not fully participating at a site, the State partially participates to support OROs). States are still required to fully participate in at least one of each scenario within the 8-year cycle. If a local ORO lies within the

EPZ of more than one NPP and full participation poses an undue hardship, it may request permission to partially participate. OROs submit requests for exemption from full participation to the FEMA Regional Office, which will forward the request to FEMA Headquarters.

Full-participation Versus Full-scale

Full participation is a REP-specific term found in 44 CFR § 350.2(j) that refers to an exercise in which: (1) 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; (2) the integrated capability to adequately assess and respond to an accident at a commercial nuclear power plant is tested; and (3) the implementation of the observable portions of state and/or local plans is tested.

In accordance with HSEEP, a true **full-scale exercise** is a multi-agency, multi-jurisdictional, multi-discipline exercise involving functional (e.g., joint field office, emergency operations centers, etc.) and "boots on the ground" response (e.g., firefighters decontaminating mock victims). For the purposes of the REP Program, a full-scale exercise meets the intent of the full-participation exercise.

Most REP biennial full-participation joint exercises are *functional* exercises – they meet the criteria for full participation, but some response capabilities are simulated or demonstrated out of sequence from the scenario. In addition, not every ORO is required to participate in every full-participation exercise.

b. Scenario Variations

Exercises are a critical component of FEMA's reasonable assurance determinations that ORO REP plans/procedures are adequate to protect public health and safety in the vicinity of operating or proposed commercial NPPs. REP exercise scenarios need to be enhanced to help avoid anticipatory responses by exercise participants due to preconditioning and to emphasize the expected interfaces and coordination between key decision-makers based on realistic postulated events. Traditionally, REP exercise scenarios have been designed to reliably deliver the expected demonstrations in a manner that facilitates performance and evaluation. This situation has resulted in a pattern of predictable biennial exercises that may precondition responders toward certain expectations about how the exercise scenario will unfold. Some of the predictable features of biennial exercise scenarios included:

- A large radiological release, often resulting in the need for public dose-based protective actions beyond 5 miles;
- The initial plant conditions for the exercise often suggested the scenario outcome;
- The licensee was not allowed to mitigate the accident before a release occurs;
- The release occurred after a General Emergency is declared;
- Initial PARs were developed based on plant conditions rather than on an assessment of radiological conditions;
- The release was directed toward the major population centers without regard for existing meteorological conditions and terminated before the exercise ends;
- The exercise escalated in a sequential manner through the emergency classes; and
- There was enough time between emergency classes to facilitate the evaluation of required demonstrations.

Further, typical scenarios in biennial exercises use simulated accidents such as loss of coolant and steam generator tube rupture accidents, which do not address HAB incidents or site-specific "all-hazards" incidents. Therefore, FEMA and the NRC have added new scenario variables, including varied release conditions, non-sequential escalation of emergency classification levels, and incorporating HAB incidents.

FEMA and the NRC currently allow exercise planners to vary the cause and magnitude of the radioactive release as long as they meet two key criteria:

- Plume-phase scenarios must result in actual or potential conditions that trigger PADs for the public at varying distances in the EPZ (e.g., evacuation, shelter-in-place, and use of KI). If the scenario calls for no or minimal release, OROs use alternative methods (e.g., controller injects, out-of-sequence activities, or other venues) to demonstrate the capability to make and implement PADs.
- At least one exercise every 8 years[68] must include a post-plume phase ingestion pathway and relocation/reentry/return exercise.

The Planning and Preparedness Assessment Strategy Complements the Joint Biennial Exercise

The expansion of venues for demonstrating preparedness outside of the biennial exercise increases flexibility in the REP exercise program. For example, if the biennial exercise scenario is using the no/minimal release variable, OROs can use other types of exercises or out-of-sequence activities to meet evaluation requirements for the Demonstration Criteria that were not met through the biennial exercise. This concept is further discussed in Section IV: Program Administration, G. Demonstration Considerations for No/Minimal Release Scenarios.

Periodic exercises demonstrate response to a wide spectrum of incidents including, but not limited to, those with and without core damage, with and without a radiological release, that involve hostile action against the site, and that allow realistic simulated actions to mitigate consequences of the incident.

The introduction of the scenario variations below is intended to enhance the variability of exercise events and minimize any negative training practices. The initiating event of an exercise scenario is varied to go beyond the traditional equipment malfunctions and operation actions and bring more of an all-hazards perspective.

Required scenario variations:

(1) **Hostile action directed at the plant site involving the integration of offsite resources with onsite response**. Hostile actions against an NPP are initiating events that present unique challenges to the licensee and OROs. An HAB incident may overwhelm local and State response agencies, and may also involve response from agencies not normally involved in a REP exercise. This scenario is used in at least one exercise in the 8-year cycle. The HAB scenario variable can coincide with either a release or "no release" scenario variable, but the scenarios must not include a "no release option" for consecutive HAB exercises at a particular site.

(2) **An initial classification of or rapid escalation to a Site Area Emergency or General Emergency.** Skipping or rapidly escalating ECLs can make scenarios more realistic and challenging. One scenario variable option is to have an initial classification of or rapid escalation (within 30 minutes) to a Site Area Emergency or General Emergency. This scenario is used in at least one exercise in the 8-year cycle and will vary depending on the jurisdictions' plans/procedures.

(3) **No radiological release or an unplanned minimal radiological release that requires the site to declare a Site Area Emergency, but does not require the declaration of a General Emergency.** Not having every exercise result in a radiological release will help avoid anticipatory responses. Licensees are required to use this variable at

[68] 44 CFR § 350.9(c)(4) requires that States within the 50-mile EPZ of a site exercise the ingestion exposure pathway at least once every 5 years. This was modified to 6 years in 10 CFR Part 50, Appendix E, Section IV.F.2.d and GM PR-1, "Policy on NUREG-0654/FEMA-REP-1 and 44 CFR 350 Requirements" (October 4, 1985). The cycle was modified to 8 years by Supplement 4.

least once per 8-year exercise cycle. OROs are encouraged, but not required, to participate in this exercise with the licensee. If OROs elect to participate in a joint exercise with no or minimal release, part of the planning for the exercise will include identifying Demonstration Criteria that will not be evaluated during the exercise and determining appropriate alternative demonstration and evaluation venues so that the OROs can meet their biennial evaluation requirements. See Part III of this manual for discussion of exercise planning using this scenario variable.

Optional Scenario Variations:

(4) **Varied radiological release effects and meteorological conditions**. Varying release effects and meteorological conditions from scenario to scenario is one option for enhancing realism in exercise play. The variations should be consistent with plant design, site location, and geography.

(5) **A broader spectrum of initiating/concurrent events.** All-hazard incidents may be considered as possible scenario initiating or concurrent events, based on applicability to the site, provided that they do not become the primary focus of the exercise or detract from the demonstration of REP capabilities. All-hazard incidents may include:

- **Natural disaster** historically applicable to the area (e.g., hurricane, tornado, earthquake, flooding);
- **Site-specific all-hazards incidents** (e.g., accident involving near-site facility, train derailment on or adjacent to site owner controlled area); and
- **Seasonal factors** impacting the PARs and decision process (e.g., transient populations, weather conditions, agricultural seasons).

REFERENCES

- *National Incident Management System*, December 2008.
- *Homeland Security Exercise and Evaluation Program (HSEEP)*, April 2013.
- *Comprehensive Preparedness Guide 101: Developing and Maintaining State, Territorial, Tribal, and Local Government Emergency Plans*, Version 2, November 2010.

NUREG CRITERION N.1.c

Provisions must be made to start a drill or exercise between 6:00 p.m. and 4:00 a.m. at least once in every 8-year exercise cycle. Some drills or exercises should be unannounced.[69]

Applicability and Cross-Reference to Plans: Licensee X State __ Local __

NUREG CRITERION N.1.d

An exercise shall include mobilization and implementation of State and local (as appropriate) personnel and resources adequate to verify the capability and response to a large radiological release requiring ingestion pathway protective actions beyond the 10 mile EPZ at least once every 8 years. Organizations shall specify who is responsible for the decision-making process. OROs shall reference or include the organization's procedures for making PADs and implementing protective actions based upon PAGs that are consistent with EPA recommendations, and the process for ensuring coordination of PADs with all applicable jurisdictions.[70]

Applicability and Cross-Reference to Plans: Licensee __ State X Local X

[69] This criterion added per NUREG-0654/FEMA-REP-1, Supplement 4, (2011).

[70] This criterion added per NUREG-0654/FEMA-REP-1, Supplement 4, (2011).

TO MEET THE INTENT OF CRITERION N.1.d, ORO PLANS/PROCEDURES SHALL INDICATE THAT:

- ✓ The State and other OROs (as appropriate) will participate in an ingestion pathway exercise at least once every 8 years.
- ✓ States that do not have an NPP located within their borders, but are located within the 50-mile EPZ of a bordering State's NPP, must fully participate in at least one exercise at least once every 8 years at the bordering State's site(s).
- ✓ OROs within the 50-mile EPZ that are not part of the full-participation ingestion exercise with the State participate in an ingestion tabletop exercise or other ingestion pathway training activity at least once during the exercise cycle.
- ✓ The number and types of personnel participating in ingestion aspects of an exercise will be sufficient for carrying out those ingestion measures required by the incident scenario.

EXPLANATION:

States within the 50-mile ingestion exposure pathway EPZ of an NPP must participate in the ingestion pathway portion of exercises at least once every 8 years at that site.[71] The level of participation may vary.

States that have multiple sites rotate this participation from site to site; no partial participation is required. During the year in which the full-participation ingestion pathway exercise is held at one of the sites, the responsible OROs review their ingestion pathway plans/procedures for the other sites within the State to verify their accuracy and completeness. This review validates the identification of farms, food processors, and distributors. OROs report this review and any resultant plan revisions in the ALC as part of the annual review and plans/procedures update.

If a State is within the 50-mile ingestion exposure pathway zone of a site located in a bordering State, and also has a site located within its own borders, the State partially participates in all ingestion pathway-related exercises for those bordering State sites. States that do not have an NPP located within their borders, but are located within the 50-mile EPZ of a bordering State's NPP, must fully participate in at least one exercise at least once every 8 years at the bordering State's site(s).

Since local governments are not usually required to develop and test ingestion pathway plans/procedures and preparedness, State officials would be the emergency personnel primarily involved in the ingestion pathway portion of exercises. However, in some States, local governments have responsibilities that require their participation in such exercises. The number and function of personnel needed is sufficient for carrying out those protective action measures that are necessitated by a particular accident scenario. Also, organizations with field sampling responsibilities that are fully participating in the ingestion pathway portion of an exercise deploy field monitoring teams to secure and analyze media samples as required by the accident scenario.

OROs within the 50-mile EPZ that are not part of the full-participation ingestion exercise with the State participate in an ingestion tabletop exercise or other ingestion pathway training activity at least once during the exercise cycle. OROs report this ingestion pathway training in the ALC.

These ingestion exposure pathway phase activities may be performed either in connection with or separate from a plume exercise. Separating ingestion from plume activities would provide OROs with additional time for performing these activities more comprehensively. If separated, the plume phase technical data may be extended into ingestion exposure pathway activities. However, the bases for performing the ingestion exposure pathway phase activities may be derived from technical data other than that which was used in the previous plume exercise.

REFERENCES

- 44 CFR § 350.9.c

[71] 44 CFR § 350.9(c)(4) requires that States within the 50-mile EPZ of a site exercise the ingestion exposure pathway at least once every 5 years. This was modified to 6 years in GM PR-1, "Policy on NUREG-0654/FEMA-REP-1and 44 CFR 350 Requirements" (October 4, 1985) and subsequently to 8 years in NUREG-0654/FEMA-REP-1, Supplement 4.

NUREG CRITERION N.2

A drill is a supervised instruction period aimed at testing, developing and maintaining skills in a particular operation. A drill is often a component of an exercise. A drill shall be supervised and evaluated by a qualified drill instructor. Each organization shall conduct drills, in addition to the biennial[72] exercise at the frequencies indicated below:

NUREG CRITERION N.2.a

Communications Drills. Communications with State and local governments within the plume exposure pathway Emergency Planning Zone shall be tested monthly. Communications with Federal emergency response organizations and States within the ingestion pathway shall be tested quarterly. Communications between the nuclear facility, State and local emergency operations centers, and field assessment teams shall be tested annually. Communication drills shall also include the aspect of understanding the content of messages.

Applicability and Cross-Reference to Plans: Licensee X State X Local X

TO MEET THE INTENT OF CRITERION N.2.a, ORO PLANS/PROCEDURES SHALL INDICATE THAT:

- ✓ ORO communications systems are tested monthly.
- ✓ Communications with the Federal response organizations and States within the ingestion pathway are tested quarterly.
- ✓ Communications with the NPP, ORO EOCs, and field assessment teams are tested annually.
- ✓ All communications drills include a message content check.

EXPLANATION

OROs test communications with organizations that have roles in the emergency response at the minimum intervals specified in the Evaluation Criterion. These tests include more than just assurance that the communications hardware is functioning properly. The plans/procedures need to ensure that the messages likely to be transmitted in an emergency will be understood by the receiving organizations. OROs could accomplish this goal by structuring drills to include a "content check" using the actual messages or notifications that would be sent to the receiving organization in an emergency. The term "content check" means that a message should be read by the initiator and is either repeated back or is otherwise verified as accurately received (i.e., fax, etc.).

The only communication drills with Federal agencies that needs to be performed is with FEMA. Any issues that OROs are having with federal communication drills should be brought to the attention of the FEMA Regional Administrator.

REFERENCES

- *National Incident Management System*, December 2008.
- *Homeland Security Exercise and Evaluation Program (HSEEP)*, April 2013.
- *Comprehensive Preparedness Guide 101: Developing and Maintaining State, Territorial, Tribal, and Local Government Emergency Plans*, Version 2, November 2010.

[72] Annual exercises changed to biennial exercises per FEMA GM PR-1, Policy on NUREG-0654/FEMA-REP-1 and 44 CFR Periodic Requirements, October 1, 1985.

NUREG CRITERION N.2.b

***Fire Drills*. Fire drills shall be conducted in accordance with the plant (nuclear facility) technical specifications.**

Applicability and Cross-Reference to Plans: Licensee _X_ State __ Local __

NUREG CRITERION N.2.c

***Medical Emergency Drills*. A medical emergency drill involving a simulated contaminated individual which contains provisions for participation by the local support services agencies (i.e., ambulance and offsite medical treatment facility) shall be conducted annually. The offsite portions of the medical drill may be performed as part of the required biennial[73] exercise.**

Applicability and Cross-Reference to Plans: Licensee _X_ State __ Local _X_

TO MEET THE INTENT OF CRITERION N.2.c, ORO PLANS/PROCEDURES SHALL INDICATE THAT:

✓ Medical emergency drills are conducted annually .

EXPLANATION

OROs conduct medical emergency drills, commonly referred to as medical services drills, annually to demonstrate that procedures for transporting contaminated, injured, or exposed individuals to the appropriate medical facility can be implemented. Drills also enable medical facility staff to demonstrate proper care of contaminated, injured, or exposed persons at appropriately equipped facilities. The focus of these drills is contamination control measures, not medical protocols per se. The exception pertains to modification of contamination control procedures and decisions on transportation to a medical facility when the individual has an urgent medical condition. FEMA evaluates medical services drills biennially; drills may be held in conjunction with the biennial evaluated exercise.

Drills provide opportunity for responders to determine the nature and extent of an individual's external radiological contamination. This demonstration may be performed in the field prior to transport to the medical facility or immediately upon arrival. If monitoring is deferred until arrival at the medical facility, the transport crew assumes that the individual is contaminated and follows appropriate contamination control measures. Medical priorities are established so that if the individual has an urgent medical condition, radiological monitoring and contamination control measures would not hinder medical care.

Medical emergency drills include the following elements:

- Provisions are made for conducting appropriate drills for contaminated, injured, or exposed individuals.
- Drills provide opportunity for responders to determine the nature and extent of an individual's external radiological contamination.
- Personnel responsible for transporting individuals from the incident site follow appropriate contamination control measures.
- An appropriate official determines which medical facility the individual will be taken to, and that the individual is transported without undue delay.
- Communications are maintained with the receiving medical facility.
- The vehicle and occupants are monitored to detect the nature and extent of radiological contamination and, if necessary, are decontaminated.

[73] Annual exercises changed to biennial exercises per FEMA GM PR-1, Policy on NUREG-0654/FEMA-REP-1 and 44 CFR Periodic Requirements, October 1, 1985.

- At the medical facility, appropriate staff members are present or available on short notice.
- The medical facility prepares for arrival of a contaminated, injured, or exposed individual and sets up appropriate contamination control measures.
- Medical personnel demonstrate the capability to determine whether individuals are contaminated, as appropriate, and demonstrate the procedures and equipment to remove contamination.
- Medical personnel maintain contamination control measures, including contaminated waste disposal during and after treatment.
- Dosimetry procedures are established and implemented.

REFERENCES

- *National Incident Management System*, December 2008.
- *Homeland Security Exercise and Evaluation Program (HSEEP)*, April 2013.
- *Comprehensive Preparedness Guide 101: Developing and Maintaining State, Territorial, Tribal, and Local Government Emergency Plans*, Version 2, November 2010.

NUREG CRITERION N.2.d

***Radiological Monitoring Drills*. Plant environs and radiological monitoring drills (onsite and offsite) shall be conducted annually. These drills shall include collection and analysis of all sample media (e.g., water, vegetation, soil and air), and provisions for communications and record keeping. The State drills need not be at each site. Where appropriate, local organizations shall participate.**

Applicability and Cross-Reference to Plans: Licensee X State X Local X

TO MEET THE INTENT OF CRITERION N.2.d, ORO PLANS/PROCEDURES SHALL INDICATE THAT:

✓ Radiological monitoring drills are conducted annually.

EXPLANATION

The organization's plans/procedures state that radiological monitoring drills will be conducted annually. The radiological monitoring drill may be held in conjunction with an evaluated exercise. Demonstration Criteria 1.a.1, 1.d.1, 1.e.1, 4.a.2, 4.a.3, and 4.b.1 may be used as a guide to what topics drills cover.

REFERENCES

- *National Incident Management System*, December 2008.
- *Homeland Security Exercise and Evaluation Program (HSEEP)*, April 2013.
- *Comprehensive Preparedness Guide 101: Developing and Maintaining State, Territorial, Tribal, and Local Government Emergency Plans*, Version 2, November 2010.

NUREG CRITERION N.2.e(1)

***Health Physics Drills* (1). Health physics drills shall be conducted semi-annually which involve response to, and analysis of, simulated elevated airborne and liquid samples and direct radiation measurements in the environment. The State drills need not be at each site.**

Applicability and Cross-Reference to Plans: Licensee X State X Local __

TO MEET THE INTENT OF CRITERION N.2.e, ORO PLANS/PROCEDURES SHALL INDICATE THAT:

✓ Health physics drills are conducted semi-annually.

EXPLANATION

Demonstration Criteria 1.a.1, 1.d.1, 1.e.1, 4.a.2, 4.a.3, and 4.b.1 may be used as a guide to what topics drills cover.

REFERENCES

- *National Incident Management System*, December 2008.
- *Homeland Security Exercise and Evaluation Program (HSEEP)*, April 2013.
- *Comprehensive Preparedness Guide 101: Developing and Maintaining State, Territorial, Tribal, and Local Government Emergency Plans*, Version 2, November 2010.

NUREG CRITERION N.2.e(2)

Health Physics Drills (2). Analysis of inplant liquid samples with actual elevated radiation levels shall be included in Health Physics drills by licensees annually.

Applicability and Cross-Reference to Plans: Licensee X State __ Local __

NUREG CRITERION N.3

Each organization shall describe how exercises and drills are to be carried out to allow free play for decisionmaking and to meet the following objectives. Pending the development of exercise scenarios and exercise evaluation guidance by the NRC and FEMA the scenarios for use in exercises and drills shall include, but not be limited to, the following:

a. The basic objective(s) of each drill and exercise and appropriate evaluation criteria;

b. The date(s), time period, place(s), and participating organizations;

c. The simulated events;

d. A time schedule of real and simulated initiating events;

e. A narrative summary describing the conduct of the exercises or drills to include such things as simulated casualties, offsite fire department assistance, rescue of personnel, use of protective clothing, deployment of radiological monitoring teams, and public information activities; and

f. A description of the arrangements for and advance materials to be provided to official observers.

Applicability and Cross-Reference to Plans: Licensee X State X Local X

TO MEET THE INTENT OF CRITERION N.3, ORO PLANS/PROCEDURES SHALL INDICATE THAT:

✓ Each of the items a through f above will be addressed in the scenario developed for the exercise.

EXPLANATION

Plans/procedures discuss the ORO's approach to exercises that allows free play for decision making and the maximum realism possible. This discussion includes the process of scenario development. Part III.B of this manual provides guidance on exercise scenario development.

REFERENCES

- *National Incident Management System*, December 2008.
- *Homeland Security Exercise and Evaluation Program (HSEEP)*, April 2013.
- *Comprehensive Preparedness Guide 101: Developing and Maintaining State, Territorial, Tribal, and Local Government Emergency Plans*, Version 2, November 2010.

NUREG CRITERION N.4

Biennial exercises shall be evaluated and critiqued as required. FEMA evaluators shall evaluate offsite emergency response organization performance in the biennial exercise in accordance with FEMA REP exercise methodology.[74]

Applicability and Cross-Reference to Plans: Licensee X State X Local X

TO MEET THE INTENT OF CRITERION N.4., ORO PLANS/PROCEDURES SHALL STATE THAT:

✓ ORO exercise performance is evaluated according to FEMA REP exercise methodology.

EXPLANATION

Part III of the REP Program Manual includes six Assessment Areas that are derived from the 16 Planning Standards of 44 CFR Part 350 and NUREG-0654/FEMA-REP-1 and their associated Evaluation Criteria. Each Assessment Area contains Sub-elements and Demonstration Criteria designed to exercise the implementation of ORO plans/procedures. Part III also contains detailed guidance on the development, conduct, evaluation, and documentation of REP exercises.

Part III.B, *REP Program Exercise Guidance: REP Exercise Process* provides guidance on conducting exercise evaluation and post-exercise critiques.

REFERENCES

- FEMA GM-8, Revision 1, *RAC Coordination With Utilities*, October 3, 1983.
- *National Incident Management System*, December 2008.
- *Homeland Security Exercise and Evaluation Program (HSEEP)*, April 2013.
- *Comprehensive Preparedness Guide 101: Developing and Maintaining State, Territorial, Tribal, and Local Government Emergency Plans*, Version 2, November 2010.

[74] This criterion amended per NUREG-0654/FEMA-REP-1, Supplement 4, (2011).

NUREG CRITERION N.5

Each organization shall establish means for evaluating observer and participant comments on areas needing improvement, including emergency plan procedural changes, and for assigning responsibility for implementing corrective actions. Each organization shall establish management control used to ensure that corrective actions are implemented.

Applicability and Cross-Reference to Plans: Licensee X State X Local X

TO MEET THE INTENT OF CRITERION N.5, ORO PLANS/PROCEDURES SHALL DESCRIBE:

✓ Processes for correcting issues identified during exercises.

EXPLANATION

The organization's plans/procedures include processes for correcting issues identified during exercises. This process includes a description of the issue, the organization and individual, by title/position, responsible for implementing the chosen corrective action, and the timeframe for completing the corrective action. The State's ALC and annual update include the results of exercises and verification that any changes to plans/procedures and needed training have been completed, with the exception of Deficiencies, which are addressed in a separate AAR.

REFERENCES

- FEMA GM-8, Revision 1, *RAC Coordination With Utilities*, October 3, 1983.
- *National Incident Management System*, December 2008.
- *Homeland Security Exercise and Evaluation Program (HSEEP)*, April 2013.
- *Comprehensive Preparedness Guide 101: Developing and Maintaining State, Territorial, Tribal, and Local Government Emergency Plans*, Version 2, November 2010.

15. Planning Standard O – Radiological Emergency Response Training

Radiological emergency response training is provided to those who may be called on to assist in an emergency.

NUREG CRITERION O.1

Each organization shall assure the training of appropriate individuals.

Applicability and Cross-Reference to Plans: Licensee X State X Local X

TO MEET THE INTENT OF CRITERION O.1, ORO PLANS/PROCEDURES SHALL:

- ✓ Identify organizations responsible for coordinating radiological training.
- ✓ Identify organizations that will ensure radiological emergency response training will be included as part of fire, police, and ambulance/rescue training, if appropriate.
- ✓ Describe provisions to ensure availability of just-in-time training on basic radiation protection for all emergency workers, as needed.
- ✓ Describe provisions to ensure appropriate personnel participate in training courses designed for individuals who will assist in radiological emergency response (e.g., transportation providers).

EXPLANATION

The plans/procedures identify organizations responsible for coordinating radiological-specific and other relevant emergency response training. The plans/procedures also state that the organizations will ensure that personnel who will be called on in radiological emergency response operations (e.g., transportation providers, radiological monitors) participate in appropriate Federal- and State-sponsored training courses. Training includes procedures for initial notification, basic radiation protection, including dosimetry and KI use, ICS, and review of evacuation routes. Plans/procedures also include provisions for just-in-time training on basic radiation protection for emergency workers, as needed. The plans/procedures identify which organizations will ensure that radiological emergency response training will be part of fire, police, and ambulance/rescue training, if appropriate for those organizations. Training for hospital/medical facility personnel, ambulance/rescue teams, and police and fire departments includes procedures for notification, basic radiation protection, and expected roles.

REFERENCES

- *National Incident Management System*, December 2008.
- *Comprehensive Preparedness Guide 101: Developing and Maintaining State, Territorial, Tribal, and Local Government Emergency Plans*, Version 2, November 2010.

NUREG CRITERION O.1.a

Each facility to which the plan applies shall provide site-specific emergency response training for those offsite emergency organizations who may be called upon to provide assistance in the event of an emergency.

Applicability and Cross-Reference to Plans: Licensee X State ___ Local ___

NUREG CRITERION O.1.b

Each offsite response organization shall participate in and receive training. Where mutual aid agreements exist between local agencies such as fire, police, and ambulance/rescue, the training shall also be offered to the other departments that are members of the mutual aid district.

Applicability and Cross-Reference to Plans: Licensee __ State X Local X

TO MEET THE INTENT OF O.1.b, THE ORO PLANS/PROCEDURES SHALL STATE THAT:

✓ Training is offered to the mutual aid district, if mutual aid plans/procedures have been established between local agencies.

EXPLANATION

Plans/procedures identify mutual aid organizations and specify the arrangements for offering training to or receiving training from those organizations, as appropriate.

REFERENCES

- *National Incident Management System*, December 2008.
- *Comprehensive Preparedness Guide 101: Developing and Maintaining State, Territorial, Tribal, and Local Government Emergency Plans*, Version 2, November 2010.

NUREG CRITERION O.2

The training program for members of the onsite emergency organization shall, besides classroom training, include practical drills in which each individual demonstrates ability to perform his assigned emergency function. During the practical drills, on-the-spot correction of erroneous performance shall be made and a demonstration of the proper performance offered by the instructor.

Applicability and Cross-Reference to Plans: Licensee X State __ Local __

NUREG CRITERION O.3

Training for individuals assigned to licensee first aid teams shall include courses equivalent to Red Cross Multi-Media.

Applicability and Cross-Reference to Plans: Licensee X State __ Local __

NUREG CRITERION O.4

Each organization shall establish a training program for instructing and qualifying personnel who will implement radiological emergency response plans. The specialized initial training and periodic retraining programs (including the scope, nature, and frequency) shall be provided in the following categories:

NUREG CRITERION O.4.a

Directors or coordinators of the response organizations;

Applicability and Cross-Reference to Plans: Licensee _X_ State _X_ Local _X_

TO MEET THE INTENT OF CRITERION O.4.a, ORO PLANS/PROCEDURES SHALL DISCUSS:

- ✓ Training programs specific to directors/coordinators;
- ✓ Scope of the training programs;
- ✓ Time intervals at which these training programs will be offered; and
- ✓ Organizations (e.g., licensee, FEMA) that will provide training assistance, if applicable.

EXPLANATION

If OROs do not have adequate capability and resources to accomplish training for directors or coordinators, plans/procedures identify which organization (e.g., licensee, FEMA) they would call on for training assistance.

REFERENCES

- *National Incident Management System*, December 2008.
- *Comprehensive Preparedness Guide 101: Developing and Maintaining State, Territorial, Tribal, and Local Government Emergency Plans*, Version 2, November 2010.

NUREG CRITERION O.4.b

Personnel responsible for accident assessment;

Applicability and Cross-Reference to Plans: Licensee _X_ State _X_ Local _[75]_

TO MEET THE INTENT OF CRITERION O.4.b, ORO PLANS/PROCEDURES SHALL DISCUSS:

- ✓ Training programs specific to accident assessment personnel;
- ✓ Scope of the training programs;
- ✓ Time intervals at which these training programs will be offered; and
- ✓ Organizations (e.g., licensee, FEMA) that will provide training assistance, if applicable.

EXPLANATION

The plans/procedures discuss training programs specific to accident assessment personnel.

REFERENCES

- *National Incident Management System*, December 2008.
- *Comprehensive Preparedness Guide 101: Developing and Maintaining State, Territorial, Tribal, and Local Government Emergency Plans*, Version 2, November 2010.

[75] NRC and FEMA encourage OROs that have these capabilities to continue to include them in their training programs.

NUREG CRITERION O.4.c

Radiological monitoring teams and radiological analysis personnel;

Applicability and Cross-Reference to Plans: Licensee _X_ State _X_ Local _[76]_

TO MEET THE INTENT OF CRITERION O.4.c, ORO PLANS/PROCEDURES SHALL DISCUSS:

- ✓ Training programs specific to radiological monitoring teams and radiological analysis personnel;
- ✓ Scope of the training programs;
- ✓ Time intervals at which these training programs will be offered; and
- ✓ Organizations (e.g., licensee, FEMA) that will provide training assistance, if applicable.

EXPLANATION

The plans/procedures discuss training programs specific to radiological monitoring teams and radiological analysis personnel.

REFERENCES

- *National Incident Management System*, December 2008.
- *Comprehensive Preparedness Guide 101: Developing and Maintaining State, Territorial, Tribal, and Local Government Emergency Plans*, Version 2, November 2010.

NUREG CRITERION O.4.d

Police, security, and fire-fighting personnel;

Applicability and Cross-Reference to Plans: Licensee _X_ State _[77]_ Local _X_

TO MEET THE INTENT OF CRITERION O.4.d, ORO PLANS/PROCEDURES SHALL DISCUSS:

- ✓ Training programs specific to police, security, and firefighting personnel;
- ✓ Scope of the training programs;
- ✓ Time intervals at which these training programs will be offered; and
- ✓ Organizations (e.g., licensee, FEMA) that will provide training assistance, if applicable.

EXPLANATION

The plans/procedures discuss training programs specific to police, security, and firefighting personnel.

REFERENCES

- *National Incident Management System*, December 2008.
- *Comprehensive Preparedness Guide 101: Developing and Maintaining State, Territorial, Tribal, and Local Government Emergency Plans*, Version 2, November 2010.

[76] NRC and FEMA encourage State and local governments that have these capabilities to continue to include them in their training programs.

[77] NRC and FEMA encourage State and local governments that have these capabilities to continue to include them in their training programs.

NUREG CRITERION O.4.e

Repair and damage control/correctional action teams (onsite);

Applicability and Cross-Reference to Plans: Licensee X State __ Local __

NUREG CRITERION O.4.f

First aid and rescue personnel;

Applicability and Cross-Reference to Plans: Licensee X State _[78]_ Local X

TO MEET THE INTENT OF CRITERION O.4.f, ORO PLANS/PROCEDURES SHALL DISCUSS:

- ✓ Training programs specific to first aid and rescue personnel;
- ✓ Scope of the training programs;
- ✓ Time intervals at which these training programs will be offered; and
- ✓ Organizations (e.g., licensee, FEMA) that will provide training assistance, if applicable.

EXPLANATION

The plans/procedures discuss training programs specific to first aid and rescue personnel.

REFERENCES

- *National Incident Management System*, December 2008.
- *Comprehensive Preparedness Guide 101: Developing and Maintaining State, Territorial, Tribal, and Local Government Emergency Plans*, Version 2, November 2010.

NUREG CRITERION O.4.g

Local support services personnel including Civil Defense/Emergency Service personnel;[79]

Applicability and Cross-Reference to Plans: Licensee X State __ Local X

TO MEET THE INTENT OF CRITERION O.4.g, ORO PLANS/PROCEDURES SHALL DISCUSS:

- ✓ Training programs specific to support services personnel;
- ✓ Scope of the training programs;
- ✓ Time intervals at which these training programs will be offered; and
- ✓ Organizations (e.g., licensee, FEMA) that will provide training assistance, if applicable.

EXPLANATION

The plans/procedures discuss training programs specific to support services personnel.

[78] NRC and FEMA encourage State and local governments that have these capabilities to continue to include them in their training programs.

[79] Civil defense/emergency service personnel are also referred to as emergency management personnel.

REFERENCES

- *National Incident Management System*, December 2008.
- *Comprehensive Preparedness Guide 101: Developing and Maintaining State, Territorial, Tribal, and Local Government Emergency Plans*, Version 2, November 2010.

NUREG CRITERION O.4.h

Medical support personnel;

Applicability and Cross-Reference to Plans: Licensee X State X Local X

TO MEET THE INTENT OF CRITERION O.4.h, ORO PLANS/PROCEDURES SHALL DISCUSS:

- ✓ Training programs specific to medical support personnel, including specific training for hospital/medical facility staff and transportation providers;
- ✓ Scope of the training programs;
- ✓ Time intervals at which these training programs will be offered; and
- ✓ Organizations (e.g., licensee, FEMA) that will provide training assistance, if applicable.

EXPLANATION

The plans/procedures discuss training programs specific to medical support personnel.

REFERENCES

- *National Incident Management System*, December 2008.
- *Comprehensive Preparedness Guide 101: Developing and Maintaining State, Territorial, Tribal, and Local Government Emergency Plans*, Version 2, November 2010.

NUREG CRITERION O.4.i

Licensee's headquarters support personnel;

Applicability and Cross-Reference to Plans: Licensee X State __ Local __

NUREG CRITERION O.4.j

Personnel responsible for transmission of emergency information and instructions.

Applicability and Cross-Reference to Plans: Licensee X State X Local X

TO MEET THE INTENT OF CRITERION O.4.j, ORO PLANS/PROCEDURES SHALL DISCUSS:

- ✓ Training programs specific to personnel responsible for transmission of emergency information and instructions;
- ✓ Scope of the training programs;
- ✓ Time intervals at which these training programs will be offered; and
- ✓ Organizations (e.g., licensee, FEMA) that will provide training assistance, if applicable.

EXPLANATION

The plans/procedures discuss training programs specific to personnel responsible for transmission of emergency information and instructions.

REFERENCES

- FEMA GM-21, Revision 1, *Acceptance Criteria for Evacuation Plans*, February 29, 1984.
- *National Incident Management System*, December 2008.
- *Comprehensive Preparedness Guide 101: Developing and Maintaining State, Territorial, Tribal, and Local Government Emergency Plans*, Version 2, November 2010.

NUREG CRITERION O.5

Each organization shall provide for the initial and annual retraining of personnel with emergency response responsibilities.

Applicability and Cross-Reference to Plans: Licensee X State X Local X

TO MEET THE INTENT OF CRITERION O.5, THE PLANS/PROCEDURES SHALL:

- ✓ State which organizations will provide initial training as well as retraining.

FEMA HIGHLY RECOMMENDS THAT PLANS/PROCEDURES INCLUDE:

- ✓ A training matrix that lists all available courses and provides general descriptions of those courses; and
- ✓ Names of the organizations requiring training and the type of training they require.

EXPLANATION

The plans/procedures state that organizations will provide personnel with initial training as well as annual retraining. A description of the types and sources of training courses available to emergency personnel are listed in the plans/procedures.

REFERENCES

- *National Incident Management System*, December 2008.
- *Comprehensive Preparedness Guide 101: Developing and Maintaining State, Territorial, Tribal, and Local Government Emergency Plans*, Version 2, November 2010.

16. Planning Standard P – Responsibility for the Planning Effort: Development, Periodic Review and Distribution of Emergency Plans

Responsibilities for plan development and review and for distribution of emergency plans are established, and planners are properly trained.

NUREG CRITERION P.1

Each organization shall provide for the training of individuals responsible for the planning effort.

Applicability and Cross-Reference to Plans: Licensee X State X Local X

TO MEET THE INTENT OF CRITERION P.1, ORO PLANS/PROCEDURES SHALL:

- ✓ Identify, by title/position, individuals responsible for oversight of plan/procedure development and maintenance, including the positions referred to in Criteria P.2 and P.3, and any other positions with planning responsibilities.
- ✓ Specify the training regimen for the identified individuals.

EXPLANATION

Plans/procedures identify emergency planners by title/position and describe provisions to ensure their training.

REFERENCES

- *National Incident Management System*, December 2008.
- *Comprehensive Preparedness Guide 101: Developing and Maintaining State, Territorial, Tribal, and Local Government Emergency Plans*, Version 2, November 2010.

NUREG CRITERION P.2

Each organization shall identify by title the individual with the overall authority and responsibility for radiological emergency response planning.

Applicability and Cross-Reference to Plans: Licensee X State X Local X

TO MEET THE INTENT OF CRITERION P.2, ORO PLANS/PROCEDURES SHALL:

- ✓ Identify, by title/position, the individual responsible for radiological emergency response planning.

EXPLANATION

Plans/procedures identify the position with the overall responsibility and authority for emergency response planning. This position is the legally designated authority responsible for radiological emergency preparedness and response (e.g., the senior elected official), but may or may not be the same position with operational responsibility.

REFERENCES

- *National Incident Management System*, December 2008.
- *Comprehensive Preparedness Guide 101: Developing and Maintaining State, Territorial, Tribal, and Local Government Emergency Plans*, Version 2, November 2010.

NUREG CRITERION P.3

Each organization shall designate an Emergency Planning Coordinator with responsibility for the development and updating of emergency plans and coordination of these plans with other response organizations.

Applicability and Cross-Reference to Plans: Licensee X State X Local X

TO MEET THE INTENT OF CRITERION P.3, ORO PLANS/PROCEDURES SHALL:

- ✓ Identify, by title/position, the individual responsible for developing and updating emergency plans/procedures as well as coordinating plans/procedures with other response organizations.

EXPLANATION

The plans/procedures identify the Emergency Planning Coordinator. This may be the same position identified under Criterion P.2, or it may be a separate emergency planning coordinator position with operational responsibility for planning and coordination (e.g., the County Emergency Management Director).

REFERENCES

- *National Incident Management System*, December 2008.
- *Comprehensive Preparedness Guide 101: Developing and Maintaining State, Territorial, Tribal, and Local Government Emergency Plans*, Version 2, November 2010.

NUREG CRITERION P.4

Each organization shall update its plan and agreements as needed, review and certify it to be current on an annual basis. The update shall take into account changes identified by drills and exercises.

Applicability and Cross-Reference to Plans: Licensee X State X Local X

TO MEET THE INTENT OF CRITERION P.4, ORO PLANS/PROCEDURES SHALL INCLUDE:

- ✓ Evidence that plans/procedures and agreements have been reviewed for accuracy and completeness of information and appropriate changes made within the last year (e.g., a signature page, etc.);
- ✓ A process for correcting plan issues identified in drills and exercises;
- ✓ A process for periodic update of maps; and
- ✓ A process for periodic updating of ingestion pathway information (e.g., a list of food processing facilities, etc.) (See also Criterion J.11.).

EXPLANATION

States are required to submit an ALC[80] to the appropriate FEMA Regional Administrator by January 31st of each year, certifying, among other things, that the ORO plans/procedures and agreements have been updated as needed and are current.

The plans/procedures are updated periodically to correct plan issues identified in drills and exercises. The latest AAR contains a list of Deficiencies, Areas Requiring Corrective Action (ARCAs), and Plan Issues. The correction of these items may necessitate plan/procedure changes.

[80] See Part IV, Annual Letter of Certification.

REFERENCES

- Memorandum from Kay Goss to Directors, Regions I, II, III, IV, V, VI, VII, IX, and X dated July 5, 2000 on *Annual Letter of Certification Reporting Requirements Under 44 CFR Part 350 and NUREG-0654/FEMA-REP-1*, Revision 1.
- *National Incident Management System*, December 2008.
- *Homeland Security Exercise and Evaluation Program (HSEEP)*, April 2013.
- *Comprehensive Preparedness Guide 101: Developing and Maintaining State, Territorial, Tribal, and Local Government Emergency Plans*, Version 2, November 2010.

NUREG CRITERION P.5

The emergency response plans and approved changes to the plans shall be forwarded to all organizations and appropriate individuals with responsibility for implementation of the plans. Revised pages shall be dated and marked to show where changes have been made.

Applicability and Cross-Reference to Plans: Licensee X State X Local X

TO MEET THE INTENT OF CRITERION P.5, ORO PLANS/PROCEDURES SHALL:

- ✓ List the organizations and individuals who are given the updated plans/procedures.
- ✓ Identify individual(s), by title/position, responsible for distributing plan/procedure updates and what the update cycle is.
- ✓ Include revision bar markings or equivalent visual indications on revised pages to reflect where changes were made and on what date, or a summary list of changes in cases where changes are so numerous or extensive that revision bars are impractical.

EXPLANATION

The plans/procedures contain lists of organizations and individuals who are given the plan updates. The plans/procedures also indicate individuals, by title/position, responsible for distributing the updates and what the update cycle is (e.g., updates are distributed by June 1 of each year). The update mechanism covers all procedures (e.g., in some cases, a sub-organization, such as a school district, may be responsible for updating its own procedures). OROs date and (preferably) mark revised pages with revision bars or some other indication of where changes were made. Where changes are so numerous or extensive that revision bars are impractical, OROs supply a list or summary of changes.

REFERENCES

- *National Incident Management System*, December 2008.
- *Comprehensive Preparedness Guide 101: Developing and Maintaining State, Territorial, Tribal, and Local Government Emergency Plans*, Version 2, November 2010.

NUREG CRITERION P.6

Each plan shall contain a detailed listing of supporting plans and their source.

Applicability and Cross-Reference to Plans: Licensee X State X Local X

TO MEET THE INTENT OF CRITERION P.6, ORO PLANS/PROCEDURES SHALL CONTAIN:

- ✓ A list of supporting radiological emergency plans/procedures.

EXPLANATION

Plans/procedures include a list of other organizations' emergency response plans that are referenced or otherwise support implementation (e.g., municipalities, school districts, hospital/medical facilities, etc.), if applicable.

REFERENCES

- *National Incident Management System*, December 2008.
- *Comprehensive Preparedness Guide 101: Developing and Maintaining State, Territorial, Tribal, and Local Government Emergency Plans*, Version 2, November 2010.

NUREG CRITERION P.7

Each plan shall contain an appendix listing, by title, procedures required to implement the plan. The listing shall include the section(s) of the plan to be implemented by each procedure.

Applicability and Cross-Reference to Plans: Licensee X State X Local X

TO MEET THE INTENT OF CRITERION P.7, ORO PLANS/PROCEDURES SHALL:

- ✓ Include a list of all implementing procedures associated with the body of the plan. The list indicates which section(s) of the plan are implemented by each procedure.

EXPLANATION

Plans identify the procedural documents not included in the body of the plan, as well as which section of the plan the procedure supports. For example, plans identify an EOC activation checklist and cross-reference it to the section of the plan covering EOC operations.

REFERENCES

- *National Incident Management System*, December 2008.
- *Comprehensive Preparedness Guide 101: Developing and Maintaining State, Territorial, Tribal, and Local Government Emergency Plans*, Version 2, November 2010.

NUREG CRITERION P.8

Each plan shall contain a specific table of contents. Plans submitted for review should be cross-referenced to these criteria.

Applicability and Cross-Reference to Plans: Licensee X State X Local X

TO MEET THE INTENT OF CRITERION P.8., ORO PLANS/PROCEDURES SHALL CONTAIN:

- ✓ A specific table of contents; and
- ✓ A cross-reference between the plans/procedures and the NUREG-0654/FEMA-REP-1 Evaluation Criteria.

EXPLANATION

The plans/procedures contain a table of contents and a table cross-referencing the plans/procedures to the NUREG-0654/FEMA-REP-1 Evaluation Criteria. The NUREG-0654/FEMA-REP-1 cross-reference table is specific; it addresses each Evaluation Criterion element and provides references to specific subparts of the plans/procedures. The cross-reference does not merely indicate, for example, a chapter containing dozens of pages; it references sections specific enough to allow reviewers to quickly locate the relevant information. A detailed cross-reference ensures all NUREG-0654/FEMA-REP-1

criteria are addressed, facilitates review and updating of the plans/procedures, and helps avoid the common situation of a piece of information being updated in one section of the plans/procedures, but not in another.

REFERENCES

- *National Incident Management System*, December 2008.
- *Comprehensive Preparedness Guide 101: Developing and Maintaining State, Territorial, Tribal, and Local Government Emergency Plans*, Version 2, November 2010.

NUREG CRITERION P.9

Each licensee shall arrange for and conduct independent reviews of the emergency preparedness program at least every 12 months. (An independent review is one conducted by any competent organization either internal or external to the licensee's organization, but who are not immediately responsible for the emergency preparedness program). The review shall include the emergency plan, its implementing procedures and practices, training, readiness testing, equipment, and interfaces with State and local governments. Management controls shall be implemented for evaluation and correction of review findings. The result of the review, along with recommendations for improvements, shall be documented, reported to appropriate licensee corporate and plant management, and involved Federal, State, and local organizations, and retained for a period of 5 years.

Applicability and Cross-Reference to Plans: Licensee _X_ State __ Local __

NUREG CRITERION P.10

Each organization shall provide for updating telephone numbers in emergency procedures at least quarterly.

Applicability and Cross-Reference to Plans: Licensee _X_ State _X_ Local _X_

TO MEET THE INTENT OF CRITERION P.10, ORO PLANS/PROCEDURES SHALL INDICATE:

✓ Who, by title/position, is responsible for quarterly updates of each procedure that contains telephone numbers.

EXPLANATION

This criterion refers to emergency *procedures*; the plans/procedures identify individuals, by title/position, or organizations responsible for quarterly updates of each procedure that contains telephone numbers. The update function may be centralized or different sub-organizations may be responsible for updating their own procedures. Quarterly updates do not need to involve physical replacement of procedure pages if there are no changes; the objective is to ensure that someone checks quarterly to see whether any of the numbers have changed.

REFERENCES

- *National Incident Management System*, December 2008.
- *Comprehensive Preparedness Guide 101: Developing and Maintaining State, Territorial, Tribal, and Local Government Emergency Plans*, Version 2, November 2010.

Part III: REP Program Demonstration Guidance

A. INTRODUCTION

This section of the REP Manual supplements the HSEEP process and provides specific guidance unique to the design, development, conduct, evaluation, and improvement planning of REP exercises. FEMA provides this guidance for REP controllers, evaluators, contractors, and any OROs responsible for planning, preparing, and executing REP exercises, as well as other Federal staff who assist the FEMA as members of the RACs. This section provides licensee partners with guidelines regarding coordination of REP exercise activities by the Federal Government.

1. Contents and Organization

This manual presents Part III in three major subparts:

Subpart B, REP Exercise Process, provides an overview of REP Program-specific exercise scheduling, design and development, evaluation, and improvement planning considerations.

Subpart C, Assessment Areas, explains the REP Assessment Areas. FEMA derived the Assessment Areas from the Planning Standards and associated Evaluation Criteria of NUREG-0654/FEMA-REP-1 that OROs must demonstrate in exercises. The Assessment Areas functionally restate the Planning Standards and Evaluation Criteria. The following headings describe the Sub-elements of each Assessment Area:

- **Intent** – describes the origin and purpose of the Assessment Area Sub-element.
- **Demonstration Criterion** – identifies the applicable NUREG-0654/FEMA-REP-1 Planning Standard(s) and interprets the essentials of emergency actions associated with that Sub-element.
- **Assessment/Extent of Play** – provides a baseline for the extent of demonstration, or "play," required for a given Demonstration Criterion during an exercise or assessment in a different venue (drill, training, etc.).

2. Background

FEMA bases its reasonable assurance determination that OROs can protect the health and safety of the public in the event of an incident at an NPP on both adequate plans/procedures and the demonstrated ability to implement them. OROs use exercises, drills, seminars, training, SAVs, and actual events to practice and fine-tune plan implementation. FEMA observes or uses records of ORO activities, as well as plan reviews, SAVs, and the ALC, to fulfill its responsibility to assess the adequacy of offsite response. Part III focuses primarily on exercises, but touches on the other venues for assessment as well. More detailed guidance on plan reviews, the ALC, and SAVs is located in Part IV.

HSEEP: Using HSEEP methodology for exercises facilitates program efficiency. Integration with HSEEP concepts does not establish additional exercise requirements for the REP Program or replace existing REP Demonstration Criteria.

National Exercise Program (NEP): The DHS NEP uses HSEEP exercises to test, assess and improve the nation's preparedness and resiliency. Like National Exercise Program exercises, REP exercises verify the ability of OROs to implement various aspects of their response plans and demonstrate their preparedness. However, in the REP Program, the regulations in 44 CFR Part 350 dictate certain capabilities the OROs must demonstrate. Under these regulations, REP exercises must demonstrate reasonable assurance that OROs can meet the Planning Standards of NUREG-0654/FEMA-REP-1.

Demonstration Criteria: REP exercises use the REP Assessment Areas, Sub-elements, and Demonstration Criteria to observe and evaluate the ability of the OROs to meet the appropriate Planning Standards. Each Sub-element identifies a major facet of its Assessment Area. Each Demonstration Criterion sets the standard for an ORO's ability to perform a specific emergency function under the Sub-element (e.g., communicating among response organizations; making dose assessments; alerting and notifying the public). Thus, the REP Assessment Areas, Sub-elements, and Demonstration Criteria provide evaluation parameters much like the use of core capabilities within an HSEEP exercise. FEMA has identified the core capabilities that correlate to the REP Demonstration Criteria (see Part IV, Section H. Integration of REP Demonstration Criteria and Core Capabilities) so that HSEEP exercise documents may be utilized during REP exercises.

B. REP EXERCISE PROCESS

As stated previously, REP exercises use the HSEEP methodology and guidance. Key features of HSEEP methodology include:

- Scheduling through the use of an annual TEPW and multi-year TEP;
- Exercise planning and implementation in accordance with the guidelines set forth in HSEEP methodology;
- A properly formatted AAR/IP; and
- Tracking and implementation of corrective actions identified in the AAR/IP.

This section identifies the unique regulatory requirements of the REP Program that affect REP exercise scheduling, design and development, evaluation, and improvement planning within the HSEEP framework. FEMA created a crosswalk (see Exhibit IV-3: Demonstration Criteria-Core Capability Crosswalk) relating the REP Demonstration Criteria to the core capabilities to assist OROs with the integration process. The process of applying HSEEP methodology to REP exercises involves the following steps:

- Scheduling REP Activities
- Conducting Pre-Planning Activities
- Holding Exercise Planning Meetings
- Developing REP Exercise Documents
- Conducting REP Exercises
- Documenting REP Exercises

This section also explains the process for requesting and receiving REP exercise credit for participating in actual incidents (see subsection 7).

Exhibit III-1, Milestones for REP Exercise Process, provides a time frame for completing exercise development, conduct, evaluation, and reporting activities. FEMA highly recommends many of these milestones that fall short of being a requirement. However, the milestones surrounded by asterisks are relatively inflexible, representing deadlines imposed by regulations or those that could significantly impact the exercise if missed.

Exhibit III-1: Milestones for the REP Exercise Process

* # * Indicates milestones significantly impacting the exercise process

Calendar Days Before/After Exercise	Milestone	Lead/ Responsible Organization
730	Request additional Federal support (e.g., Federal Radiological Monitoring and Assessment Center (FRMAC), Advisory Team for Environment, Food, and Health, etc.), if desired for the exercise	State, FEMA
365	Establish or confirm exercise date[81]	State, FEMA
200	Identify Exercise Planning Team members	State, Utility, FEMA
180	Conduct Initial Planning Meeting (IPM) to include Concepts and Objectives (C&O) Meeting as necessary	State, Utility, FEMA
120	FEMA prepares work order for contract support	FEMA
120	If exercise includes FRMAC participation, submit required scenario and source information (for ingestion phase activities only) to FRMAC[82]	State, Utility
90	Conduct Midterm Planning Meeting (MPM). MPM participants review the following draft documents: Master Scenario Events List (MSEL), Exercise Plan (ExPlan), Controller/Evaluator (C/E) Handbook, Exercise Evaluation Guides (EEGs), and the Extent-of-Play Agreement.	State, Utility, FEMA
90	Submit approved ORO plans/procedures to FEMA Region	OROs
75	FEMA completes a review of draft ExPlan and EEGs and approves	FEMA
60	Submit draft exercise scenario for FEMA technical review	State, Utility
60	Confirm and assign controllers and evaluators	State, FEMA
45	Complete draft ExPlan	State, FEMA
45	Complete draft C/E Handbook	State, Utility, FEMA
30	FEMA completes Scenario Review and approves	FEMA
30	Finalize MSEL	State
30	Conduct Final Planning Meeting (FPM)	State, Utility, FEMA
30	Prepare and distribute C/E packets	State, FEMA
1	Conduct C/E briefing	State, FEMA
Exercise Day (ED)	Conduct Exercise	OROs
ED	Begin documenting organizational exercise performance	FEMA

[81] For changes to an exercise date due to extenuating circumstances, notice is given to the FEMA Region as soon as possible.

[82] 120 days is FEMA's guidance. FRMAC's requirement is at least 90 days for submittal of the scenario and source information. FRMAC will not participate in the exercise if the scenario and source information are received later than 90 days before the exercise.

Calendar Days Before/After Exercise	Milestone	Lead/ Responsible Organization
ED	Conduct player hot wash	OROs
ED +1	RAC Chair initiates consultation process for Deficiencies	FEMA
ED +2	Notification of potential Deficiencies to FEMA Headquarters	FEMA
ED +2	Complete exercise evaluation documentation	FEMA
ED +2	Conduct evaluator debrief	FEMA
ED +3	Evaluators conduct post-exercise participant interviews	FEMA
ED +3	Conduct participants meeting	FEMA
ED +3	Conduct post-exercise meeting that includes the public	FEMA, NRC
ED +7	Conduct controller debrief and initiate consultation process	State
ED +10	Notification of Deficiencies to State	FEMA
ED +20	State acknowledges receipt of Deficiency letter and proposes schedule for remedial actions	State
ED +30	Draft AAR/IP sent to States for review	FEMA
ED +60	Draft AAR/IP comments sent from State(s) to FEMA Region	State
ED +75	Conduct After-Action Meeting (AAM)	State, FEMA
ED +90	Final AAR/IP issued by FEMA Region	FEMA
ED +90	Share lessons learned, areas for improvement, best practices, and strengths identified in final AAR/IP	State, FEMA
ED +120	Deficiencies corrected; evaluate and report on remedial exercises	FEMA
Ongoing	Track evaluation of Demonstration Criteria	State, FEMA

1. Scheduling REP Activities

HSEEP methodology promotes synchronization across exercises, which increases efficiency and alleviates exercise fatigue. By coordinating REP scheduling with other HSEEP activities, OROs may identify opportunities to demonstrate other National Exercise Program exercise activities at a REP exercise.

The steps in scheduling REP activities include:

- Determining appropriate activity types;
- Determining exercise cycle requirements; and
- Establishing a TEP.

a. Activity Types

FEMA's planning and preparedness assessment strategy uses a combination of exercises, drills, training, SAVs, and reporting to ensure that offsite planning and preparedness remain adequate to protect the health and safety of the public. The HSEEP scheduling process permits coordination of many of these activities. The activity types described here include the variety of venues available for demonstration and evaluation of REP planning and preparedness.

(1) Exercises

Exercises conducted jointly with the licensee offer an excellent opportunity to exercise Direction and Control and Protective Action Decision-making when considering plant conditions. With the exception of the site's qualifying exercise and subsequent full-scale exercises, these Demonstration Criteria can also be adequately assessed during functional and tabletop exercises. Always use outcome-based exercise evaluation to allow for greater efficiency in the process.

The minimum capabilities assessed in a joint exercise are Sub-Element c of Assessment Area 1 and Assessment Area 2. These represent the critical decision-making capabilities requiring at least biennial demonstration in a coordinated manner in one of the following types of exercises:

- **Full-Scale Exercises** engage all ORO entities in real-time hands-on response activities including all of those specified in the Demonstration Criteria extent-of-play sections. The site uses a full-scale exercise for its qualifying exercise, which validates the adequacy of the offsite plans and procedures for formal FEMA plan approval.
- **Functional Exercises** sufficiently engage organizations to test their abilities to respond to the scenario, but participation is less than full-scale. Most REP biennial joint exercises are functional exercises because they simulate some response capabilities or demonstrate them out of sequence from the scenario, and the exercise may not require participation of all offsite entities that would respond in a real radiological emergency. Processes that require multiple elements in play for protective action decision making and implementation may be demonstrated in a functional exercise that includes full participation to the extent necessary to achieve the exercise goals. OROs may use functional exercises concurrently with a licensee's annual exercise to test utility/offsite interaction and communications.
- **Tabletop Exercises** are discussion-based and may test single or multiple scenarios and outcomes. OROs may use tabletop exercises to assess key elements in decision-making and implementation. Offsite planners may opt to use a tabletop exercise in conjunction with a licensee's annual exercise, or as a separate training or planning event. The suitability of a tabletop exercise might vary depending on the number of jurisdictions that need to participate to meet exercise objectives.

Note: Full participation is a REP-specific term found in 44 CFR § 350.2(j) that refers to the level of participation required to meet regulatory requirements. A full-participation exercise is one in which: (1) 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; (2) the integrated capability to adequately assess and respond to an accident at a commercial nuclear power plant is tested; and (3) the implementation of the observable portions of State and/or local plans is tested. Full participation exercises must occur at least biennially.

(2) Drills

Under NUREG-0654/FEMA-REP-1 Evaluation Criterion N.2, OROs conduct drills to test, develop, and maintain skills in a particular operation. Evaluation Criteria N.2.a through N.2.e establish the specific types of evaluated drills required and their frequency.

OROs may conduct other types of drills to evaluate certain Demonstration Criteria. Wherever practicable, drills provide a superior means of assessing technical proficiency, particularly in critical areas such as Emergency Worker Exposure Control and Field Monitoring. Similarly, activation drills may serve as an assessment tool for infrequently activated facilities.

(3) Seminars and Training

A major element of the ORO's annual activities includes review of training objectives, ongoing maintenance of personnel proficiency, and skill development. FEMA can observe training, seminars and practical demonstrations used to assess proficiency, wherever possible.

Occasionally, it may be appropriate for an organization to request feedback or technical advice during its training. FEMA can furnish appropriate resources in those instances and be part of the assessment.

(4) Plan Reviews

OROs and FEMA Regions review offsite plans annually for consistency and revise them where necessary. OROs and the Region jointly decide on the need to test new procedures before adoption, which they then incorporate in the annual TEP.

(5) Staff Assistance Visits (SAVs)

FEMA Headquarters and Regional staff provide support to OROs through SAVs. Such assistance can include: technical assistance with plan development, review, or implementation; attending meetings with OROs and the licensee; participating in or observing non-evaluated exercises and drills; evaluating exercises and drills to fulfill biennial requirements; and verifying ALC and plan information (e.g., KI inventories, equipment maintenance, training courses offered).

(6) Actual Events

Where a significant commonality in plans and personnel exists, an actual event could serve to validate elements for a facility's annual assessment. If time permits, the Site Specialist may deploy to the location during the event. Otherwise, the ORO can submit a request for REP exercise credit to the FEMA Region according to the process described in Section 7 of Part III.B.

b. Exercise Cycle Requirements

NUREG Criteria N.1.b and N.1.d establish considerations for both the Demonstration Criteria and the scenario variables selected for REP exercises. Exercise planners need to consider the following when scheduling REP activities:

- FEMA evaluates all elements of the NUREG-0654/FEMA-REP-1 Planning Standards, as expressed functionally through the Evaluation Areas, Sub-elements, and Demonstration Criteria, in a full participation integrated exercise at least once in an 8-year exercise cycle. FEMA must evaluate certain core elements of the Assessment Areas at least biennially. FEMA may evaluate elements involving activities that are not central to the decision-making process less frequently as indicated in Exhibit III-2, *Federal Evaluation Process Matrix*.
- States and applicable local jurisdictions must fully participate in an ingestion pathway exercise at least once every 8 years.
- Scenario Variations: NUREG Criterion N.1.b also establishes requirements for certain scenario variations within the 8-year cycle. An exercise may combine required variations.
    - At least one exercise every 8-year cycle must involve an HAB scenario.
    - At least one exercise scenario every 8-year exercise cycle must involve an initial classification of or rapid escalation (within 30 minutes) to a Site Area Emergency or General Emergency.
    - At least one exercise every 8-year cycle must include a scenario involving no radiological release or an unplanned minimal radiological release that requires the site to declare a Site Area Emergency, but does not require declaration of a General Emergency.

Exhibit III-2 provides a crosswalk between the Demonstration Criteria and NUREG-0654/FEMA-REP-1 requirements and identifies the minimum frequency for evaluation of each Demonstration Criterion. It also provides guidance on which Demonstration Criteria FEMA can evaluate during an out-of-sequence exercise activity or SAV. In addition, Exhibit III-2 identifies the Demonstration Criteria for which OROs may receive credit if applicable activities occur during an actual incident. As noted in Exhibit III-2, only certain Demonstration Criteria are eligible for actual incident credit.

Exhibit III-2: Federal Evaluation Process Matrix[83]

Assessment Area and Sub-elements	NUREG-0654/ FEMA-REP-1 Criteria	Minimum Evaluation Frequency[84]	Out-of-Sequence Evaluation	Actual Incident Credit	SAV
1. EMERGENCY OPERATIONS MANAGEMENT					
a. Mobilization					
1.a.1: OROs use effective procedures to alert, notify, and mobilize emergency personnel and activate facilities in a timely manner.	A.1.a, e; A.3, 4; C.1, 4, 6; D.4; E.1, 2; H.3, 4	At least biennially	YES	YES	NO
b. Facilities					
1.b.1: Facilities are sufficient to support the emergency response.	G.3.a; H.3; J.10.h, J.12; K.5.b	No less than once every 8 years[85]	YES	YES	YES
c. Direction and Control					
1.c.1: Key personnel with leadership roles for the ORO provide direction and control to that part of the overall response effort for which they are responsible.	A.1.d; A.2.a, b; A.3; C.4, 6	At least biennially	NO	NO	NO
d. Communications Equipment					
1.d.1: At least two communication systems are available, at least one operates properly, and communication links are established and maintained with appropriate locations. Communications capabilities are managed in support of emergency operations.	F.1, 2	At least biennially	YES[86]	NO	NO
e. Equipment and Supplies to Support Operations					
1.e.1: Equipment, maps, displays, dosimetry, KI, and other supplies are sufficient to support emergency operations.	H.7, 10; I.7, 8, 9; J.10.a, b, e; J.11, 12; K.3.a; K.5.b	At least biennially	YES	NO	YES
2. PROTECTIVE ACTION DECISION-MAKING					
a. Emergency Worker Exposure Control					
2.a.1: OROs use a decision-making process, considering relevant factors and appropriate coordination, to ensure that an exposure control system, including use of KI, is in place for emergency workers, including provisions to authorize radiation exposure in excess of administrative limits or PAGs.	C.6; J.10.e, f; K.3.a; K.4	At least biennially	NO	NO	NO

[83] See Demonstration Criteria for specific requirements.

[84] See NUREG-0654/FEMA-REP-1 Criteria N.1.b and N.1.d for additional details.

[85] Facilities evaluated once when they are new and once every 8 years thereafter. Facilities are reevaluated for this criterion if, in the interim since the last evaluation, they have substantial changes in structure, equipment, or mission that affect key capabilities, as outlined in emergency plans/procedures.

[86] Communications equipment can be demonstrated in an out-of-sequence scenario during medical services and reception/relocation center drills as negotiated in the extent of play.

Assessment Area and Sub-elements	NUREG-0654/ FEMA-REP-1 Criteria	Minimum Evaluation Frequency[84]	Out-of-Sequence Evaluation	Actual Incident Credit	SAV
b. Dose Assessment & PARs & PADs for the Emergency Event					
2.b.1: Appropriate PARs are based on available information on plant condition, field monitoring data, and licensee and ORO dose projections, as well as knowledge of onsite and offsite environmental conditions.	I.10; Supp. 3	At least biennially	NO	NO	NO
2.b.2: A decision-making process involving consideration of appropriate factors and necessary coordination is used to make PADs for the general public (including the recommendation for use of KI, if ORO policy).	A.3; C.4, 6; D.4; J.9; J.10.f, m	At least biennially	NO	NO	NO
c. PADs for the Protection of persons with disabilities and access/functional needs					
2.c.1: PADs are made, as appropriate, for groups of people with disabilities and those with access/ functional needs.	D.4; J.9; J.10.d,e	At least biennially	NO	NO	NO
d. Radiological Assessment and Decision-making for the Ingestion Exposure Pathway[87]					
2.d.1: Radiological consequences for the ingestion pathway are assessed and appropriate PADs are made based on the ORO planning criteria.	A.3; C.1, 4; D.4; J.9, 11	Every ingestion exercise	NO	NO	NO
e. Radiological Assessment & Decision-making Concerning Post-Plume Phase Relocation, Reentry, and Return					
2.e.1: Timely post-plume phase relocation, reentry, and return decisions are made and coordinated as appropriate, based on assessments of radiological conditions and criteria in the ORO's plan and/or procedures.	I.10; J.9; K.3.a; M.1	No less than once every 8 years	NO	NO	NO
3. PROTECTIVE ACTION IMPLEMENTATION					
a. Implementation of Emergency Worker Exposure Control					
3.a.1: The OROs issue appropriate dosimetry, KI, and procedures, and manage radiological exposure to emergency workers in accordance with the plans/procedures. Emergency workers periodically and at the end of each mission read their dosimeters and record the readings on the appropriate exposure record or chart. Appropriate record-keeping of the administration of KI for emergency workers is maintained.	J.10.e, K.3.a, b, K.4	At least biennially	YES	NO	NO

[87] The post-plume phase (ingestion, relocation, reentry, and return) may be demonstrated separately from the plume phase.

Assessment Area and Sub-elements	NUREG-0654/ FEMA-REP-1 Criteria	Minimum Evaluation Frequency[84]	Out-of-Sequence Evaluation	Actual Incident Credit	SAV
b. Implementation of KI Decision for Institutionalized Individuals and the Public					
3.b.1: KI and appropriate instructions are made available in case a decision to recommend use of KI is made. Appropriate record keeping of the administration of KI for institutionalized individuals and the general public is maintained.	J.10.e, f	At least biennially[88]	YES	NO	NO
c. Implementation of Protective Actions for persons with disabilities and access/functional needs					
3.c.1: PADs are implemented for people with disabilities and those with access/functional needs other than schools within areas subject to protective actions.	J.10.c, d, e, g	No less than once every 8 years	YES	YES	YES
3.c.2: OROs/school officials implement protective actions for schools.	J.10.c, d, e, g	No less than once every 8 years[89]	YES	YES	YES
d. Implementation of Traffic and Access Control[90]					
3.d.1: Appropriate traffic and access control is established. Accurate instructions are provided to traffic and access control personnel.	A.3; C.1, 4; J.10.g, j	At least biennially	YES	YES	YES
3.d.2: Impediments to evacuation are identified and resolved.	J.10.k	At least biennially	YES	YES	YES
e. Implementation of Ingestion Pathway Decisions					
3.e.1: The ORO demonstrates the availability and appropriate use of adequate information regarding water, food supplies, milk, and agricultural production within the ingestion exposure pathway emergency planning zone for implementation of protective actions.	A.3; C.1, 4; J.11	Every ingestion exercise	YES	NO	NO
3.e.2: Appropriate measures, strategies, and pre-printed instructional material are developed for implementing PADs for contaminated water, food products, milk, and agricultural production.	G.1, J.9, 11	Every ingestion exercise	YES	NO	NO
f. Implementation of Post-Plume Phase Relocation, Reentry, and Return Decisions					
3.f.1: Decisions regarding controlled reentry, relocation, and return of individuals during the post-plume phase are coordinated with appropriate organizations and implemented.	E.7; J.10.j; J.12; K.5.b; M.1,3	No less than once every 8 years	YES	NO	NO

[88] Demonstrated in every biennial exercise. Participation may be rotated among facilities, but each individual distribution facility must be evaluated no less than once every 8 years.

[89] Participation may be rotated among school districts, but each school system/district in the EPZ and at least one of its schools must be evaluated no less than once every 8 years. It is not required that every school within the school system/district be evaluated.

[90] Physical deployment of resources is not necessary except in a full-scale exercise.

Assessment Area and Sub-elements	NUREG-0654/ FEMA-REP-1 Criteria	Minimum Evaluation Frequency[84]	Out-of-Sequence Evaluation	Actual Incident Credit	SAV
4. FIELD MEASUREMENTS AND ANALYSES					
a. Plume Phase Field Measurement and Analyses					
4.a.1: [RESERVED]					
4.a.2: Field teams (two or more) are managed to obtain sufficient information to help characterize the release and to control radiation exposure.	C.1; H.12; I.7, 8, 11; J.10.a	Every full participation exercise[91]	YES	NO	NO
4.a.3: Ambient radiation measurements are made and recorded at appropriate locations, and radioiodine and particulate samples are collected. Teams will move to an appropriate low-background location to determine whether any significant (as specified in the plan and/or procedures) amount of radioactivity has been collected on the sampling media.	C.1; I.8, 9; H.12;J.10.a	Every full participation exercise	YES	NO	NO
b. Post Plume Phase Field Measurements and Sampling					
4.b.1: The field teams (two or more) demonstrate the capability to make appropriate measurements and collect samples (e.g., food crops, milk, water, vegetation, and soil) to support adequate assessments and protective action decision-making.	C.1; I.8; J.11	Every ingestion exercise	YES	NO	NO
c. Laboratory Operations					
4.c.1: The laboratory is capable of performing required radiological analyses to support PADs.	C.1; 3; J.11	No less than once every 8 years	YES	YES	NO
5. EMERGENCY NOTIFICATION AND PUBLIC INFORMATION					
a. Activation of the Prompt Alert and Notification System					
5.a.1: Activities associated with primary alerting and notification of the public are completed in a timely manner following the initial decision by authorized offsite emergency officials to notify the public of an emergency situation. The initial instructional message to the public must include as a minimum the elements required by current REP guidance.	E.5, 6, 7	At least biennially	YES	NO	NO
5.a.2: [RESERVED]					
5.a.3: Backup alert and notification of the public is completed within a reasonable time following detection by the ORO of a failure of the primary alert and notification system.	E.6; Appendix 3.B.2.c	No less than once every 8 years	YES	NO	NO

[91] Each state within the 10-mile EPZ of a commercial nuclear power site shall fully participate in an exercise jointly with the licensee and appropriate OROs at least every 2 years (44 CFR Part 350.9(c)(1)). Each state with multiple sites within its boundaries shall fully participate in a joint exercise at some site on a rotational basis at least every 2 years (44 CFR Part 350.9(c)(2)). When not fully participating in an exercise at a site, the state shall partially participate at that site to support full participation of the OROs. See NUREG-0654/FEMA-REP-1 Criterion N.1.b for clarification of full participation.

Assessment Area and Sub-elements	NUREG-0654/ FEMA-REP-1 Criteria	Minimum Evaluation Frequency[84]	Out-of-Sequence Evaluation	Actual Incident Credit	SAV
5.a.4: Activities associated with FEMA approved exception areas (where applicable) are completed within 45 minutes of the initial decision by authorized offsite emergency officials to notify the public of an emergency situation.	E.6; Appendix 3.B.2.c	At least biennially	YES	NO	NO
b. Emergency Information and Instructions for the Public and the Media					
5.b.1: OROs provide accurate emergency information and instructions to the public and news media in a timely manner.	E.5, 7; G.3.a; G.4.a, c	At least biennially	YES	NO	NO
6. Support Operation/Facilities					
a. Monitoring, Decontamination, and Registration of Evacuees					
6.a.1: The reception center facility has appropriate space, adequate resources, and trained personnel to provide monitoring, decontamination, and registration of evacuees.	A.3; C.4; J.10.h; J.12	No less than once every 8 years[92]	YES	YES	NO
b. Monitoring and Decontamination of Emergency Workers and their Equipment and Vehicles					
6.b.1: The facility/ORO has adequate procedures and resources to accomplish monitoring and decontamination of emergency workers and their equipment and vehicles.	K.5.a, b	No less than once every 8 years	YES	YES	NO
c. Temporary Care of Evacuees					
6.c.1: Managers of congregate care facilities demonstrate that the centers have resources to provide services and accommodations consistent with planning guidelines. Managers demonstrate the procedures to assure that evacuees have been monitored for contamination and have been decontaminated as appropriate before entering congregate care facilities.	J.10.h; J.12	No less than once every 8 years[93]	YES	YES	YES
d. Transportation and Treatment of Contaminated Injured Individuals					
6.d.1: The facility/ORO has the appropriate space, adequate resources, and trained personnel to provide transport, monitoring, decontamination, and medical services to contaminated injured individuals.	F.2; H.10; K.5.a,b; L.1, 4	At least biennially	YES	YES	NO

[92] Participation may be rotated among facilities, but each facility must be evaluated no less than once every 8 years.

[93] Facilities managed by the American Red Cross under the American Red Cross/FEMA MOU will be evaluated once when designated or when substantial changes occur; all other facilities not managed by the American Red Cross must be evaluated no less than once every 8 years.

c. The Training and Exercise Planning Workshop

OROs typically develop and review the TEP each year at an annual TEPW. REP schedules can align with other HSEEP activities through participation in TEPWs, as appropriate. At these meetings, OROs review the REP training and exercise schedules in the TEP to identify opportunities to combine activities and potential schedule conflicts. In addition, coordinated scheduling of REP exercises involving multiple States or FEMA Regions can occur at the TEPW.

Before attending the TEPW, OROs and the FEMA Region determine: (1) what type(s) of exercise they will schedule; and (2) what time period the scheduling will cover.

Maximizing the TEPW

Knowing more details about the timing and necessity of REP training and exercises maximizes the opportunities to combine other efforts and/or avoid scheduling conflicts.

Activities considered at the TEPW include all REP planning, training and exercise events and incorporate a schedule for SAVs. The schedule also includes plan reviews as necessary, as well as events not normally within the scope of REP activities. The purpose is to review all training, exercises, and plans to incorporate these activities in the upcoming year's schedule. If another scheduled activity or exercise provides an opportunity to meet requirements, OROs can take full advantage of that activity and reduce or eliminate redundant exercises.

The overall goal is to include REP trainings and exercises in the local TEPs, as appropriate. Ultimately, the RAC Chairs are responsible for ensuring the entry of REP exercises into the National Exercise Schedule (NEXS).

2. Conducting Preplanning Activities

a. Establish an Exercise Planning Team

The REP exercise design and development process will include establishing an exercise planning team led by the State(s) (or designee), with representatives from the licensee, OROs, and FEMA REP staff. This exercise planning team will hold one or more planning meetings as needed to determine exercise scope, design, scenario, and logistics.

Because exercise planning team members have access to scenario-related information, ORO representatives on the exercise planning team serve as confidential representatives/trusted agents (CRs/TAs). They may participate substantially in the exercise design but must agree not to divulge exercise confidences to potential players or others involved in the exercise. For exercises, confidential representatives/trusted agents may only serve on the response team in limited instances. The following conditions must exist:

- The ORO must have a shortage of available personnel; and
- The CR/TA must fill a role that would not employ the confidential information. For example, he or she could serve as traffic/access controller, reception center monitor, dispatcher, or dose assessment team member, but could not serve as a primary decision maker.

b. Identify the Responsible OROs for Demonstration Criteria

Generally, ORO plans/procedures assign responsibilities for multiple emergency response functions to individual response organizations. Exercise planners analyze all Demonstration Criteria, as well as those Demonstration Criteria evaluated for each ORO in the previous three exercises, and the set of emergency functions in order to assign Demonstration Criteria to the appropriate OROs.

The RAC Chair and site specialist will coordinate with the State REP Program Manager, State Exercise Officer, State Site Specialist (if assigned), and local OROs to determine Demonstration Criteria assignments for a given location at a particular site. Assignments will vary from site to site and exercise to exercise, depending upon the plans/procedures and extent of play. Assignments should also include all locations with responsibilities for portions of a process. For example, at site X, the State EOC prepares the press releases, which the JIC then releases. Therefore, both the State EOC and the JIC have Demonstration Criterion 5.b.1, which addresses

whether OROs provide accurate information and instructions to the public and news media in a timely manner.

c. Determine Scenario Type and Variables

REP Program exercise scenarios create opportunities for OROs to demonstrate their ability to take appropriate actions to protect the public and emergency workers.

All scenarios should be realistic, plausible, and challenging, but not so complicated that they overwhelm players. Scenario development needs to take into account the following factors:

- Realism (including threats/hazards and weather variables);
- Specific site location and geography; and
- Variations (e.g., varied release conditions, non-sequential ECLs, and incorporation of HAB incidents) to reduce exercise predictability and associated negative training practices.

Prior to initiating development of a scenario, the exercise planning team agrees on the exercise objectives and Demonstration Criteria and determines which criteria the various OROs will demonstrate and the extent of play. The licensee and State then develop the scenario and submit it to the appropriate FEMA Regional REP personnel for review at least 60 days before the exercise. The FEMA RAC Chair completes a review of the scenario no later than 30 days before the exercise to confirm that it is sufficient to drive the exercise play to demonstrate the agreed-upon exercise Demonstration Criteria and extent of play. To ensure the integrity of the exercise, participants must not learn scenario details.

(1) Scenario Types

Plume Exposure Pathway exercise play.
Plume exposure pathway exercise play requires developing a scenario that will drive the demonstration of capabilities to protect public health and safety within the 10-mile EPZ. In general, the source term and resultant dose projections reach a sufficient magnitude and distance from the plant to drive the performance of the agreed-upon Demonstration Criteria and extent of play.

Ingestion Exposure Pathway exercise play.
For ingestion exposure pathway scenario development, the scenario drives exercise play for all participating jurisdictions within the 50-mile EPZ. An Initial Planning Meeting (IPM) comprised of participating agencies determines the criteria that they will demonstrate. The scenario will need to ensure that the radioactive plume and consequent ground deposition affect the appropriate areas within these jurisdictions.

Relocation, reentry, and return exercise play.
The scenario incorporates simulated offsite radiological deposition that exceeds the relocation PAGs as set forth in the affected jurisdiction's plans/procedures. For relocation activities, the projected dose is calculated for the first year, any subsequent year, and 50 years. The deposition should contain both short-lived and long-lived radionuclides, such as iodine and cesium, to prevent decision-makers from waiting out radionuclide decay to avoid relocation decisions. FEMA recommends demonstrating ingestion exposure pathway, relocation, reentry, and return activities within the same exercise when possible because of the similar scenario requirements of exercise play.

(2) Scenario Variables

As discussed in the explanation for NUREG-0654/FEMA-REP-1 Evaluation Criterion N.1.b, FEMA and the NRC added new scenario variables to enhance scenario realism and avoid preconditioning. Exercise designers must account for these scenario variables to meet the scheduling parameters. These variables include:

(a) Hostile Actions against an NPP

- A scenario variation with this initiating event is required at least once in every 8-year cycle. HAB incidents present unique challenges to the licensee and OROs. An HAB incident may overwhelm local and State response agencies, and may also involve response from agencies not normally involved in a REP exercise. The HAB scenario variable can coincide with either a release or no/minimal release scenario variable, but the scenarios must not include a no/minimal release option for consecutive HAB exercises at a particular site. Considerations for use of the HAB scenario variable may include:
  - Varying the method of attack (e.g., insider threat; ground, waterborne, or airborne attacks; or a combination);
  - Simultaneous attacks or threats to other facilities at the regional or local level that would impact ORO resource availability in responding to an incident at the NPP site;

- Equipment/component failures (e.g., failure of an emergency diesel generator or emergency core cooling system pump to start, failure of containment to isolate) to facilitate escalation in ECL or radiological release potential; and/or
- Federal players. Federal play will not impact ORO evaluation.

(b) An initial classification of or rapid escalation (within 30 minutes) to a Site Area Emergency or General Emergency

Scenarios employ this variable at least once per 8-year exercise cycle. When using this variable, the exercise planning team needs to ensure that all appropriate criteria can still be demonstrated. Reaching the GE may or may not be necessary depending on the OROs' plans/ procedures and the actions that are triggered with regard to the changing ECLs.

(c) No radiological release or an unplanned minimal radiological release that requires the site to declare a Site Area Emergency, but does not require the declaration of a General Emergency

Licensees must use this variable at least once per 8-year exercise cycle. FEMA encourages, but does not require, OROs to participate in this exercise with the licensee. If OROs elect to participate in a joint exercise with no or minimal release, part of the planning for the exercise will include identifying Demonstration Criteria that cannot be evaluated during the exercise and determining appropriate alternative demonstration and evaluation venues so that the OROs can meet their biennial evaluation requirements.

Alternative venues could include controller injects during the exercise to drive demonstration of specific response elements; out-of-sequence activities connected to the exercise; or additional activities during the assessment cycle. For example, controller injects could drive demonstration of dose projection; decisions to decontaminate people and equipment; emergency worker understanding and use of established turn back values; and field monitoring. In addition, creative scenario elements could be used to drive demonstration of protective action decision-making (e.g., evacuation, sheltering in place).

If OROs have a Deficiency related to protective action decision-making from the last exercise, regardless of whether the Deficiency has been corrected, the offsite portion of the scenario must be expanded as appropriate to drive ORO demonstration of protective action decision-making.

Due to the impact on ORO resources, the licensee and appropriate OROs must agree on the use of the "no/ minimal release" option as part of the overall scenario development process. Planners must not use a "no/minimal release" scenario in consecutive exercises.

(d) Varied radiological release effects and meteorological conditions

Varied release effects and meteorological conditions can be used to reduce the possibility of pre-conditioned responses. However, no specific requirements for use of this variable currently exist. Variations in release may include puff versus continuous release and ground-level versus elevated release; variations in conditions may include shifting wind direction and speed, precipitation, temperature, and other conditions as applicable.

(e) A broader spectrum of initiating/concurrent events

There are no specific requirements for use of this variable, but a broader spectrum of initiating/concurrent events should be used to create more realistic and challenging exercises. In addition to the traditional equipment malfunctions and operator actions, all-hazard incidents may be considered as possible scenario initiating events, based on applicability to site, provided that they do not become the primary focus of the exercise or detract from the demonstration of REP capabilities. These incidents are not limited to the impact on NPP structures or components and consider the impact on ORO resources and command and control. Such incidents may include:

- Natural disasters historically applicable to the area (e.g., hurricane, tornado, earthquake, flooding);
- Site-specific all-hazard incidents (e.g., accident involving near-site facility, train derailment on or adjacent to site owner controlled area); and
- Seasonal factors impacting the PARs and decision process (e.g., transient populations, weather conditions, agricultural seasons).

d. Select Demonstration Criteria for Evaluation

Before the planning process begins, the FEMA Region compiles a list of Demonstration Criteria that must be evaluated at the OROs to provide reasonable assurance. Some Demonstration Criteria are core functions and activities that FEMA must evaluate for each participating ORO at least biennially, as identified in Exhibit III-2, *Federal Evaluation Process Matrix*. Other Demonstration Criteria focus on specific radiological emergency response capabilities for which only certain organizations are responsible. Scenario events, exercise play, and the criterion demonstration schedule determine the particular organizations that will participate.

The type of exercise will determine which Demonstration Criteria FEMA will evaluate. For the qualifying exercise, FEMA must evaluate all Demonstration Criteria at the appropriate ORO in accordance with the plans/procedures. For biennial exercises, planners review the Demonstration Criteria evaluated during the previous three exercises to determine those that need to be evaluated for the current exercise cycle. The FEMA Region will come to the IPM with the recommended list of Demonstration Criteria for evaluation. This list provides a starting point for discussions to define the extent of play and scope of the exercise during the subsequent planning meetings.

The FEMA Region also considers Demonstration Criteria that may be performed out of sequence. The RAC Chair will make the final decision on all aspects of acceptable out-of-sequence evaluations. The biennial after-action report (AAR) includes out-of-sequence evaluations that are scheduled no more than 60 days prior to or 30 days after the biennial exercise. A separate AAR documents out-of-sequence evaluations scheduled outside the specified timeframe.

In addition, the FEMA Region considers any credit given to OROs for activities performed during real-world incidents. The process for requesting and documenting REP exercise credit is provided in subsection 7 of Part III.B.

3. Developing REP Exercise Documents

This section describes the following REP exercise documents:

- ExPlan;
- C/E Handbook;
- EEGs; and
- MSEL.

Although document development occurs as part of the Planning Meetings described in the next section, they are explained first here for clarity. Specific information relevant to the content and development of the exercise documents can be found in *Homeland Security Exercise and Evaluation Program (HSEEP)*, April 2013.

a. Exercise Plan

The exercise planning team typically distributes the ExPlan to Players and Observers, but should also give it to Controllers and Evaluators. The exercise planning team brings all information needed to complete the ExPlan to the IPM. The exercise planning team develops the draft ExPlan prior to the MPM, and creates the Final ExPlan prior to or at the FPM.

b. Controller/Evaluator Handbook

Exercise planning team only distributes the C/E Handbook to the Controllers and Evaluators. Other exercise participants must not receive the C/E Handbook.

For REP Program exercises, the exercise planning team only creates C/E Handbooks when it determines a need for them. The exercise planning team should consider creating a C/E Handbook in the following situations:

- Large number of Controllers and/or Evaluators: The C/E Handbook will help provide more specific information and targeted instruction to the larger groups.
- Complex scenario and/or MSEL: The C/E Handbook can include the scenario details, injects, and/or MSEL itself to ensure that Controllers and Evaluators have all pertinent information.

For exercises without a C/E Handbook, the exercise planning team can easily include additional information within the ExPlan itself (e.g., Controller and Evaluator roles and responsibilities) or its appendices for information with limited distribution (e.g., scenario information).

c. Exercise Evaluation Guides

FEMA recommends that REP exercise planners develop REP-specific, core capability-based EEGs. The core capability-based Master EEGs maintain the integrity of the REP exercise criteria while providing useful information that helps jurisdictions test and build their core capabilities.

The FEMA Region decides the degree of exercise planning team and ORO involvement in tailoring the Master EEGs into exercise-specific EEGs. A successful evaluation does not require direct ORO involvement in the EEG development process.

FEMA recommends providing all information needed to complete the EEGs at the IPM. The exercise planning team develops the Draft EEGs prior to the MPM, with the Final EEGs being created prior to or at the FPM.

d. Master Scenario Events List

Exercise planners may use scenario injects to increase participation by OROs during lulls in the primary radiological response activities. For example, a scenario inject for a simulated HAZMAT incident could require an immediate response by OROs. While scenario injects may enhance exercise play for OROs, they should not detract from the primary goals, technical analysis, and timeline of the primary scenario.

Most REP/HSEEP exercises may not need an MSEL Meeting because player reactions to a limited number of scenario events (i.e., ECL changes and PADs) primarily control exercise play. However, exercises with HAB or non-REP scenario elements (e.g., a joint REP and all-hazards exercise) may warrant an MSEL Meeting.

MSEL Meetings, when used, should include a representative from the licensee to ensure that changes in offsite event timing do not conflict with the onsite scenario that drives licensee actions. Exercise planners must ensure that MSEL injects are either timed to be consistent with the onsite scenario events or the exercise planning team must conduct a MSEL Meeting as early as possible to give the licensee time to modify the scenario and reactor simulator model.

4. Holding Exercise Planning Meetings

Following meetings occur after the preplanning activities.

a. Concepts and Objectives Meeting

A Concepts and Objectives (C&O) Meeting is held to identify the type and scope of the exercise, as well as the specific Demonstration Criteria that will be evaluated. The C&O meeting can be combined with the IPM as appropriate.

b. Initial Planning Meeting

The IPM lays the foundation for exercise development and generally occurs at least 6 months before the exercise to address:

- REP Demonstration Criteria to be evaluated, including location and by whom;
- Core capabilities;
- Scenario type and variables;
- Out-of-sequence demonstrations and potential exercise schedule;
- Roles and responsibilities for exercise document preparation; and
- Schedule for upcoming planning meetings.

The FEMA Region identifies any Demonstration Criteria that need to be evaluated based on Exhibit III-2 as well as any outstanding, uncorrected ARCAs and brings this list to the IPM for concurrence and finalization with the appropriate OROs.

Following the IPM, and leading up to the MPM, the exercise planning team develops the following:

- Final list of Demonstration Criteria/Core Capabilities to be evaluated;
- Initial draft Extent-of-Play Agreement;
- Draft ExPlan;
- Draft EEGs; and
- Initial draft of offsite scenario and MSEL.

c. Midterm Planning Meeting

The MPMs generally occur 3 months before the exercise. Items to address and accomplish include:

- Negotiate and finalize the ORO Extent-of-Play Agreement.

- Review the Draft ExPlan and incorporate the finalized extent of play.
- Review general scenario concepts (FEMA reviews the scenario before the exercise and does not wait for the FPM).
- Review draft MSEL, if needed.
- Review draft EEGs.
- Prepare the out-of-sequence events schedule.
- Prepare the exercise events schedule.
- Determine the need for a C/E Handbook.
- Discuss and resolve planning and logistical issues.

Some exercise planning teams may decide to hold more than one meeting to prepare all the items typically covered in the MPM, especially if there is a large volume of information to review. In any event, the exercise planning team finishes drafting and fully reviews the following documents before the FPM:

- C/E Handbook, if needed;
- ExPlan;
- EEGs;
- Scenario (limited to Trusted Agents only); and
- MSEL, if needed (limited to Trusted Agents only).

d. Final Planning Meeting

The purpose of a FPM is to undertake a comprehensive review of all finalized exercise documents and identify and resolve any outstanding items. Generally speaking, the FPM should occur no later than 30 days before the exercise.

During the FPM, the exercise planning team:

- Reviews all exercise processes and procedures;
- Approves all exercise documents;
- Finalizes exercise logistics;
- Finalizes controller and evaluator assignments;
- Resolves outstanding items or schedules their resolution; and
- Determines information to present at the exercise briefings.

Following the FPM, the exercise planning team:

- Compiles Controller Packets (State/OROs);
- Compiles Evaluator Packets (FEMA); and
- Finalizes exercise briefings.

5. Conducting REP Exercises

This section provides guidance for activities conducted immediately before and after the exercises including:

- Assigning and Confirming Evaluators;
- Pre-Exercise Meetings/Briefings; and
- Post-Exercise Briefings.

a. Assigning and Confirming Evaluators

REP exercises use evaluators specifically trained to identify and evaluate the REP Demonstration Criteria. The FEMA Region bases its determination regarding the number of REP evaluators assigned to each jurisdiction upon the number of Demonstration Criteria requiring evaluation and the Extent-of-Play Agreement. The RAC Chair (or designee) ensures that all evaluators have completed the required REP-approved training courses offered by FEMA's Emergency Management Institute as well as on-the-job training with a FEMA-accepted evaluator.

b. Pre-Exercise Meetings/Briefings

Prior to the exercise, the exercise planning team provides the exercise participants with a briefing to educate them on their roles and responsibilities during the exercise. The briefings provide a schedule of meetings and exercise events, logistical information, and instructions and procedures for conducting the exercise and evaluation activities.

Evaluator briefings include information and instructions regarding the REP/HSEEP evaluation approach used by the Region. The briefings address the applicable Demonstration Criteria/core capabilities to be evaluated, the exercise scenario overview, the timeline of significant events, and how evaluators will document the results.

c. Post-Exercise Meetings

Although all HSEEP exercises include hot washes, 44 CFR § 350.9 requires post-exercise participant briefings and public meetings for REP exercises. The RAC Chair conducts two meetings – one with participants only to discuss preliminary results, and one including the public to discuss the evaluation of the exercise.

Hot wash: Unlike HSEEP, which is designed for "no-fault" exercises, exercise evaluation under the REP program is driven by regulation and the results are graded. Therefore, the HSEEP concept of a Hot Wash, with Evaluators and Players sharing observations and identifying exercise issues together, may not be practical for an evaluated REP/HSEEP exercise. State and OROs can incorporate their separate controller/player hot wash results into the Draft AAR/Improvement Plan (IP) after the FEMA regulatory findings are completed. FEMA highly encourages HSEEP hot washes at non-evaluated REP activities.

Participant briefing: FEMA uses the participant briefing conducted after the REP exercise as an opportunity to present OROs with initial exercise results. These results include identified strengths, areas for improvement, and potential issues. The briefing provides OROs with the opportunity to discuss the preliminary results of the exercise so they have a clear understanding of the issues and can provide their perspective. The RAC Chair conducts the participant briefing.

The recommended participant briefing agenda is as follows:

- Review by RAC Chair of offsite activities, including the option of the RAC Chair asking evaluation team leaders or specific evaluators to make presentations regarding their observations;
- Presentation of OROs views;
- Review of Federal response, if applicable, by RAC Chair; and
- Question-and-answer period.

The presentations provide a brief integrated overview of the highlights of the exercise. They include commendations for good performance and a preliminary assessment of strengths and weaknesses of the demonstration. At this stage, the RAC Chair may discuss potential exercise issues not yet classified as Deficiencies or ARCAs. This meeting provides OROs with a forum to discuss the preliminary exercise results so that they clearly understand the issues and can provide their perspective on the situation.

Public meeting: The RAC Chair conducts the public meeting in accordance with 44 CFR § 350.9(e). The RAC Chair may combine the participant briefing with the public meeting at his or her discretion. The State or licensee publishes notice of the public meeting 7 days prior to the exercise date in the local newspaper with the largest circulation in the area (or other comparable media, at the discretion of the FEMA Regional Administrator [or designee]). The RAC Chair will invite representatives of participating OROs, the NRC, and other Federal agencies. Members of the public and media may attend as observers.

The recommended public meeting agenda is as follows:

- Review of onsite actions (presented by the NRC);
- Presentation of licensee views;
- Review by RAC Chair of offsite activities, including the option of the RAC Chair asking evaluation team leaders or specific evaluators to make presentations regarding their observations;
- Presentation of OROs views;
- Review of Federal response, if applicable, by RAC Chair; and
- Question-and-answer period.

During the public meeting, the FEMA Regional Administrator (or designee) provides an overview of the exercise, along with his or her observations. The FEMA Regional Administrator (or designee) may solicit comments from RAC members and other evaluators at his or her discretion. When discussing organizational performance problems during the meeting, FEMA regional officials do not classify these problems as Deficiencies or ARCAs.

The FEMA Regional Administrator (or designee) may accept written comments from the public and media during or after the meeting at his or her discretion. The FEMA Regional Office retains copies of each written submission, along with a written response. The Regional Administrator (or designee) takes results of the meeting and any written comments received into consideration in his or her evaluation of the exercise.

For remedial exercises, the FEMA Regional Administrator (or designee), at his or her discretion, may conduct a public meeting. This meeting acquaints the public and media with any significant plans/procedures amendments and discusses the results of the remedial exercise. When the Regional Administrator holds this meeting, it proceeds in the same manner as meetings held in conjunction with biennial exercises that take place after the initial 44 CFR Part 350 qualifying exercise.

6. Documenting REP Exercises

a. Identifying Exercise Outcomes and Issues

During exercises or other evaluated demonstrations, evaluators make extensive notes on the activities that occur. Evaluators also note any variations from expected activities and outcomes. After the exercise, evaluators compile their observations into narratives that describe the capabilities demonstrated and any weaknesses in the organization's ability to carry out expected actions.

The Assessment Areas and Demonstration Criteria are designed to assist FEMA in assessing how successfully OROs carry out their REP plans/procedures to meet planning and preparedness requirements outlined in 44 CFR Part 350.

The AAR/IP captures observations from the exercise and includes recommendations for post-exercise improvements.

REP Terminology: Issue

An *issue* is any problem in organizational performance that is linked through the Assessment Areas, Sub-elements, and Demonstration Criteria to specific NUREG-0654/FEMA-REP-1 Planning Standards and applicable Evaluation Criteria.

(1) Identifying Issues

The REP program uses specific terminology to characterize problems identified during an exercise. FEMA has established the following categories of issues:

- **Deficiency:** An observed or identified inadequacy of organizational performance in an exercise that could cause a finding that offsite emergency preparedness is not adequate to provide reasonable assurance that appropriate protective measures can be taken in the event of a radiological emergency to protect the health and safety of the public living in the vicinity of an NPP.
- **ARCA:** An observed or identified inadequacy of organizational performance in an exercise that is not considered, by itself, to adversely impact public health and safety.
- **Plan Issue:** An observed or identified inadequacy in the ORO's emergency plan/procedures, rather than in the ORO's performance.

FEMA includes these issues in the exercise AAR/IP. FEMA can include non-REP issue recommendations for improvement (i.e., not linked to NUREG-0654/FEMA-REP-1 requirements) in the AAR/IP or address them independently in accordance with the HSEEP AAR/IP process.

(2) Correcting Issues during the Exercise

In some circumstances, an ORO may correct an issue immediately during the play of the exercise. FEMA and the OROs negotiate the immediate re-demonstration of issues before the exercise. Each Region's RAC Chair determines the Demonstration Criteria eligible for re-demonstration. During the extent-of-play negotiations (part of the exercise planning process), each ORO requests the criteria for redemonstration during the exercise.

During the exercise, an evaluator who notes that an ORO did not correctly demonstrate activities for a particular criterion advises the appropriate controller of the issue. Participants may redemonstrate an activity that the ORO or FEMA determined was not performed satisfactorily only when the correction would not interrupt the flow of the exercise. The controller or other ORO personnel will retrain the staff that performed the criterion activity incorrectly. Upon completion of the training, those staff will redemonstrate the criterion activity. If the ORO demonstrates that activity adequately, the AAR will record the issue, but a follow-on statement will describe the corrective action demonstrated.

(3) Classifying Issues

The RAC Chair, in consultation with the other RAC members present at the exercise, will determine the severity of each issue. If the RAC Chair determines that an issue will be an ARCA, the evaluator will complete a specific issue narrative. However, if the RAC chair classifies the issue as a potential Deficiency, he or she must immediately notify FEMA Headquarters of the issue. The RAC Chair must then, within 2 days, write a description of the issue and the reasons he or she believes it may receive Deficiency classification. FEMA Headquarters staff will, in turn, notify NRC headquarters.

Areas for Potential Deficiencies

Over the history of REP Program exercises, FEMA has identified Deficiencies in all six Assessment Areas. The Assessment Areas provide a means to evaluate OROs' ability to meet the criteria outlined in Planning Standards A, C, D, E, F, G, H, I, J, K, L, and M. The Assessment Areas do not address Planning Standard B, which applies only to licensees, or Planning Standards N, O, and P, which address administrative topics.

The RAC Chair should use definitions, facts, and overall exercise performance to determine classification. The RAC Chair also considers the potential impact of the identified issues on public health and safety, including the following:

- If the identified issue *could, by itself, have an adverse impact* on public health and safety, the RAC Chair classifies the issue as a Deficiency.
- A RAC Chair may assess a Deficiency when the collective impact of two or more ARCAs on an organization's emergency functioning precludes adequate protection of public health and safety. Multiple exercise issues may indicate a more severe problem. If the combined effect of the exercise issues leads to a determination that offsite emergency preparedness is not adequate to provide reasonable assurance that appropriate protective measures can be taken in the event of a radiological emergency to protect the health and safety of the public living in the vicinity of a nuclear power plant, then the RAC Chair should assess a single Deficiency, rather than multiple ARCAs.
- If the identified issue *could NOT, by itself, have an adverse impact* on public health and safety, but simply reflects that the Demonstration Criteria were not met, the RAC Chair classifies the issue as an ARCA.
- If the identified issue describes any inadequacy in an ORO's performance, the RAC Chair classifies the issue as a Deficiency or ARCA, even if it resulted from following inadequate plans/procedures.

(4) Standardized Exercise Issue Numbering

FEMA employs a standardized system for numbering issues. This system provides consistency in numbering exercise issues among FEMA Regions and site-specific AARs within each Region. It also expedites tracking of issues on a nationwide basis.

Elements of the Standard Exercise Issue Number

The identifying number for Deficiencies, ARCAs, and Plan Issues includes the following elements, with each element separated by a hyphen (-).

- Plant Site Identifier – A two-digit number, corresponding to the Utility Billable Plant Site Codes (see Part IV.V for a list of these codes).
- Exercise Year – Last two digits of the year the exercise was conducted.
- Demonstration Criterion – The letters and numbers corresponding to the Demonstration Criterion in Part III.C of this FEMA REP Program Manual.
- Issue Classification Identifier – D = Deficiency, A = ARCA, P = Plan.
- Exercise Issue Identification Number – A separate two (or three) digit indexing number assigned to each issue identified in the exercise.

Exhibit III-3: Illustration of the Standard Exercise Issue Number

EXAMPLE: Issue Number: 76-94-1.b.1-A-01				
76	**94**	**1.b.1**	**A**	**01**
Plant Site Identifier	Exercise Year	Demonstration Criterion	Classification: Deficiency (D) ARCA (A) Plan (P)	Issue Number

(5) Assigning Exercise Issue Numbers

The RAC Chair assigns exercise issue identification numbers to issues included in the AAR. After all issues have been identified and classified, they are assigned an individual exercise issue identification number in the sequence in which they appear in Section III of the AAR. However, Deficiencies, ARCAs, and Plan Issues are numbered separately, with issue numbers beginning with "01" in each category.

FEMA assigns each exercise issue a unique identification number. While FEMA may need to add or delete issues during the post-exercise review process, only the last two digits of the identification numbers will change when the report is finalized.

b. Determining Demonstration Criterion Status

Once all exercise issues are classified, the RAC Chair is responsible for describing the status of each Demonstration Criterion demonstrated by individual jurisdictions and/or functional entities during the exercise or activity. In Section III of the AAR, *Exercise Evaluation and Results*, the RAC Chair may use any of the five terms that describe the status of the scheduled Demonstration Criteria at each jurisdiction and/or functional entity after the current exercise.

- **MET (M)** – The jurisdiction or functional entity performed all activities under the Demonstration Criterion to the level required in the Extent-of-Play Agreement, with no Deficiencies or ARCAs assessed under that criterion in the current exercise and no unresolved prior ARCAs.
- **DEFICIENCY (D)** – The jurisdiction or functional entity performed activities under the Demonstration Criterion, but had one or more Deficiencies assessed under the criterion.
- **ARCA (A)** – The jurisdiction or functional entity performed activities under the Demonstration Criterion, but had one or more ARCAs assessed under the criterion in the current exercise and/or one or more ARCAs assessed during a previous exercise which it did not resolve in the current exercise.
- **NOT DEMONSTRATED (N)** – For a justifiable reason, the jurisdiction or functional entity did not perform activities under the Demonstration Criterion as specified in the Extent-of-Play Agreement or at the frequency required in Exhibit III-2 (see Not Demonstrated in the glossary).
- **NOT APPLICABLE (N/A)** – The criterion does not apply to the jurisdiction.

FEMA may grant an ORO an exemption from scheduled evaluation of one or more Demonstration Criteria at an exercise if the ORO cannot participate due to response to an actual incident. If this situation is known in advance of the exercise, the State must request an exemption, which FEMA's Regional Office and Headquarters must approve.

When FEMA grants an advance exemption for one or more REP Demonstration Criteria at an exercise, the AAR lists those criteria as **MET** and documents the exemption rationale in the Extent-of-Play Agreement.

If the ORO does not receive an advance exemption and does not perform the activities under a scheduled Demonstration Criterion during the exercise, the RAC Chair carefully reviews and considers the facts surrounding the failure. If the RAC Chair determines that the reason for not performing the activities was valid, the Demonstration Criterion status is defined as **NOT DEMONSTRATED**. In general, a jurisdiction or functional entity may justify not demonstrating a criterion because:

- Exercise participation had to be suspended so the ORO, or members of its staff, could respond to an actual emergency during the time the exercise was being conducted; or
- A significant extenuating circumstance, such as a fire or flood at the facility, prevented its use during the exercise.

Note that in all cases where a criterion is defined as **NOT DEMONSTRATED**, evaluation must occur no later than the site's next biennial exercise.

If the RAC Chair determines that a failure to perform the activities under the Demonstration Criterion was not justified, the criterion status is defined as a **DEFICIENCY**.

c. Notifying the State of Deficiencies

Within 2 days of the exercise, the RAC Chair initiates consultation with FEMA Headquarters, RAC members, and the State in order to identify potential Deficiencies. As a result of this consultation process, the RAC Chair prepares a letter to the State that the Regional Administrator (or designee) will sign. The letter includes: (a) jurisdictions affected; (b) description of Deficiencies identified; (c) remedial actions recommended to correct the Deficiencies;

and (d) timeframe for completion of remedial actions. The Regional Administrator (or designee) forwards the letter within 10 days of the exercise to the State informing it of identified Deficiencies and the actions needed to correct the problem(s). Within 20 days of the exercise, the State acknowledges receipt of this letter and may either propose a schedule for remedial actions or appeal the issue classification of Deficiencies.

The FEMA Region provides copies of the letter to FEMA Headquarters and the appropriate NRC Regional Office. FEMA Headquarters then provides a copy of the letter to NRC Headquarters. For more on this process refer to Appendix A to 44 CFR Part 353 (FEMA/NRC MOU).

The FEMA Regional Administrator (or designee) determines the extent of ORO participation in a remedial exercise or drill. OROs demonstrate only those activities necessary for correction of the Deficiencies. To the extent possible, FEMA limits participation in remedial exercises to the OROs having the Deficiencies. If an ORO cannot demonstrate the corrective action without the involvement of other OROs, then their participation is at a level necessary to confirm the correction of the Deficiencies. The host NRC Regional Administrator arranges Licensee participation, if needed.

The primary reason for providing States with formal documentation of identified Deficiencies is to facilitate prompt correction of these identified problems. While it is FEMA's intent to provide this formal documentation to States within 10 days, there may be circumstances where this timeframe is not met. However, through the consultation process initiated immediately following each exercise, all involved exercise participants will be made aware of significant issues and problems that necessitate prompt correction. Subsequent formal notification of Deficiencies more than 10 days after the exercise date does not, therefore, preclude prompt correction of Deficiencies within 120 days. Similarly, if the State experiences administrative delays due to extenuating real-world incidents/circumstances which would impact the State's ability to respond to these timelines, FEMA will take this into consideration.

d. Developing the After-Action Report

The AAR/IP captures observations from the exercise and includes recommendations for post-exercise improvements. AARs are designed to meet varying levels of sensitivity – portions not intended for public disclosure can be separated and protected.

Consistent with the capability-based EEGs, the AAR/IP is capability-based (i.e., includes an analysis of capabilities exercised and activities performed as well as recommendations for addressing identified areas of improvement). Because regulations require successful demonstration of the Planning Standards, the AAR also includes discussions of ARCAs, Deficiencies, and Plan Issues. FEMA retains exercise documentation in the Regional files as a permanent record of exercise play.

The FEMA Region sends the draft AAR to the State(s) and RAC members for review and comment within 30 calendar days of the exercise. All review and comment focuses on the accuracy of data and information contained in the draft report; identification and proper classification of exercise issues; and overall report quality. Those reviewing the draft AAR contact the RAC Chair or report preparation staff for clarification of any items in question.

The FEMA Region receives all comments on the draft AAR report no later than 60 calendar days after the exercise. The RAC Chair receives all comments in writing to facilitate the consideration and incorporation of comments, the Schedule of Corrective Actions received, and the retention of comments in the Regional files. The RAC Chair will contact individual reviewers as necessary to adjudicate any comments in question. The report preparation staff incorporates approved comments into the final report.

The RAC Chair must prepare a letter reaffirming reasonable assurance for the NRC to accompany the AAR, stating that OROs can take appropriate protective measures in the event of a radiological emergency to protect the health and safety of the public living in the vicinity of an NPP. The FEMA Regional Administrator (or designee) transmits the final AAR to the NRC Regional Administrator no more than 90 days after the exercise.

Biennial exercise AARs may include the evaluations of drills or out-of-sequence activities (e.g., medical services or reception center drills) conducted within 60 days prior to or 30 days after the exercise date. FEMA issues separate drill AARs for evaluations occurring outside the specified timeframe. The FEMA Regional Administrator (or designee) transmits drill AARs to the NRC Regional Administrator within 45 days of the drill date.

The RAC Chair distributes copies of the final AAR as follows:

- Signed hard copy – mailed directly to:
  NRC Headquarters
  Document Control Desk
  US Nuclear Regulatory Commission
  Washington, DC 20555-0001
- Electronic copy to applicable NRC Region:
  - NRC Region I
    RI_FEMADistribution@nrc.gov;
  - NRC Region II
    RII_FEMADistribution@nrc.gov;
  - NRC Region III
    RIII_FEMADistribution@nrc.gov; and
  - NRC Region IV
    RIV_FEMADistribution@nrc.gov.
- Hard or electronic copy:
  - State(s) Agency/Organization with primary responsibility for REP program activity and
  - Appropriate RAC members.

An electronic copy of the cover letter of the report will be sent to the REPP HQ Branch Chief and their Regional Liaison Officer (RLO) within 90 calendar days of the exercise. This will be indication for the RLO to go into the EET, retrieve the finalized AAR, and save it to Headquarters shared drive.

e. Developing the Improvement Plan

The IP is an outcome of the AAR. The IP contains information on how OROs will correct or improve ARCAs, Deficiencies, Plan Issues, and Areas for Improvement, who is responsible, and an anticipated timeline for correction/improvement. As FEMA documents each ARCA, Deficiency, Plan Issue, and/or Area for Improvement within the AAR, OROs make a corresponding entry in the IP. The content of the IP will be negotiated during the AAM, so it is not necessary for all information to be filled in when the Draft AAR/IP goes out for comment.

f. Conducting the After-Action Meeting

The FEMA RAC Chair (or designee) holds an AAM to present, discuss, and refine the draft AAR and to develop an IP. The FEMA RAC Chair (or designee) should hold the AAM as soon as practical after the exercise so that participants can easily recall the events. The AAM may take place in person or via videoconferencing. The Regions provide the draft AAR/IP to the State within 30 days of the exercise. Generally, the AAM occurs 2 weeks after the Region provides the draft AAR/IP, which gives the OROs time to review it.

g. Issue Correction

The guidelines for correcting Deficiencies, ARCAs, and Plan Issues are listed below.

(1) Correction of Deficiencies

Because of the potential impact of Deficiencies on public health and safety, Appendix 1 to 44 CFR 350 requires corrections within 120 days of the exercise. An ORO demonstrates correction of Deficiencies identified in an exercise through remedial actions, including exercises, drills, or other actions, including plan/procedure revisions. For actions conducted to correct a Deficiency, the RAC Chair will prepare a separate AAR of the remedial exercise, drill, or other action within 30 days of the remedial action. If the ORO successfully completes the remedial action within 75 days of the biennial exercise, FEMA includes the results and findings of the remedial exercise in the final AAR for the biennial exercise.

If a remedial exercise or other remedial actions occur, but the ORO does not correct the Deficiency, FEMA initiates the following process immediately:

(a) Consult and coordinate with all pertinent parties, including the State(s), the NRC, and RAC member agencies, to discuss resolution of the Deficiency and reach agreement on the specific corrective actions that need to occur and the timetable for completing those corrective actions.

(b) Delineate the specific corrective actions (e.g., further remedial exercises, plan/procedure revisions, training) that need to occur and the timetable for accomplishing those actions.

(c) Provide the agreed-upon schedule of corrective actions and timeline to the NRC, State(s), and licensee.

(d) Enter and track corrective actions using the DHS Corrective Action Program System.

This entire process is completed within 10 calendar days of the remedial exercise in which the ORO did not resolve Deficiency.

If a Deficiency remains unresolved at the end of the 120-day period following the biennial exercise, FEMA will issue an AAR that clearly: (a) describes the effort expended and specific actions taken to resolve the Deficiency during the initial 120-day period; (b) delineates the specific corrective actions that need to occur to resolve the Deficiency and timeline for completing those actions; and (c) establishes and implements a system for monitoring and documenting, on a bi-weekly basis, OROs' continuing efforts and progress in resolving the Deficiency.

If these efforts fail to achieve the satisfactory resolution of the Deficiency, and all possible paths toward its resolution have been exhausted, the FEMA Region will issue an AAR, along with a finding that FEMA *cannot* provide reasonable assurance that public health and safety can be protected. Specifically, this report will clearly: (a) describe the effort expended and specific actions taken to resolve the Deficiency; and (b) identify the factors or obstacles that have led to the conclusion that all possible paths for resolving the Deficiency have been exhausted. Prior to issuance of any such report, the FEMA Regions must coordinate with the REP Branch Chief and Technical Hazards Division Director, NPD, at FEMA Headquarters. If FEMA has approved offsite planning and preparedness for the subject site under 44 CFR Part 350, FEMA will initiate steps to withdraw the 350 approval under 44 CFR § 350.1.

(2) Correction of ARCAs

The ORO completes correction of ARCAs as soon as practicable and FEMA verifies the correction before or during the next biennial exercise at that site. For States with multiple sites within their boundaries, the State may, at the discretion of the RAC Chair, demonstrate the correction of non-site-specific ARCAs during an exercise at another site within the State or where the 10-mile EPZ impacts the State.

(3) Correction of Plan Issues

If, during the exercise, FEMA identified some section of the plans/procedures as inadequate, it will report a Plan Issue to the State for correction, regardless of the adequacy of the ORO's performance.

FEMA includes Plan Issues in the AAR/IP and may also provide them to the State(s) for correction via letter from the RAC Chair no later than 90 days after the exercise.

The ORO corrects Plan Issues through revision of the appropriate plans/procedures within 1 year or during the next annual plan review and update. The State submits corrections for FEMA review, and reports them in the ALC.

7. REP Program Credit for Participation in Actual Incidents

As part of the HSEEP process, FEMA supports OROs seeking to combine multiple requirements into fewer total exercises. FEMA will consider granting REP Program exercise credit to OROs for their participation in a response to a real-world incident. The Credit column in Exhibit III-2: *Federal Evaluation Process Matrix* indicates which functions and activities FEMA may consider for exercise credit.

FEMA may consider granting credit for REP exercises when an ORO responds to an actual incident that compels demonstration of REP-specific criteria or capabilities.

When requesting exercise credit for a response to an actual incident, OROs need to ensure that the actual response included, at a minimum, the following four elements:

- A prompt and timely mobilization of key ORO staff and providers responsible for REP emergency functions;
- An actual reporting of the key REP staff who, in accordance with the plans/procedures, would report to the facility in a REP incident;
- Activation of the facility(ies) of the responding jurisdiction(s); and
- Establishment of communication links among responding organizations.

At a minimum, the ORO then provides the following documentation to FEMA:

- Type and nature of the incident;
- Timeline, including time of response and time the ORO REP staff arrived at the facility;
- Any applicable incident documentation including sign in/sign out sheets with name(s), function(s), date(s), and time(s);

- List of applicable REP personnel and organizations as well as their connection to a REP response;
- Communications log(s) showing the establishment of communication links with other organizations;
- List of participating jurisdictions;
- Incident decisions made and implemented;
- Resources (facilities, equipment, etc.) used; and
- List of corrective actions and/or improvement planning items identified in the AAR.

Additional documentation includes sufficient information to support the performance of specific Demonstration Criteria. For example, an ORO seeking credit for field monitoring activities includes field logs, calibration records, air sampling results, etc.

An ORO submits a request for credit to the appropriate State. If approved, the State forwards the request to the appropriate FEMA RAC Chair. The request specifies the basis for the credit and the REP Demonstration Criterion for which credit is requested. The request also contains the appropriate documentation, as specified above. The State provides this information to the appropriate FEMA RAC Chair within 90 days following the conclusion of the incident.

The RAC Chair adjudicates the ORO's request for credit and transmits it with his or her review and recommendations to the REP Branch Chief, FEMA Headquarters. The REP Branch Chief makes the final determination on the request within 30 days of receipt. If credit is granted, the RAC Chair will then issue the ORO an exemption from FEMA evaluation of the Demonstration Criterion for the next REP exercise.

FEMA will grant exemption from evaluation of a specific Demonstration Criterion only once during the exercise cycle for the applicable REP exercise. Even when FEMA grants credit, the ORO may still have to perform the function at the biennial exercise in order to avoid compromising the integrity of the exercise. This performance is at the discretion and consideration of the RAC Chair and will be determined in the Extent-of-Play Agreement negotiations.

C. EXERCISE DEMONSTRATION

Planning Standard N of NUREG-0654/FEMA-REP-1 states that "Periodic exercises are (will be) conducted to evaluate major portions of emergency response capabilities…and deficiencies identified as a result of exercises… are (will be) corrected." Evaluation Criterion N.1.a defines an exercise as "an event that tests the integrated capability and a major portion of the basic elements existing within emergency preparedness plans and organizations." The Planning Standard N Evaluation Criteria presume that exercises will be conducted as set forth in NRC and FEMA rules and exercise evaluation guidance.

FEMA's preparedness assessment philosophy focuses more on accomplishing the mission than on the steps taken to achieve a result. FEMA's Assessment Area methodology, along with the incorporation of HSEEP methodology, minimizes exercise issue inconsistencies among its Regions and makes the evaluations less dependent upon prescriptive criteria. FEMA's focus during REP exercises and drills is to test the capability of OROs to protect public health and safety.

Each of the Assessment Areas contains specific Sub-elements and Demonstration Criteria. Together, the FEMA Regions use these to develop Exercise Evaluation Guides that assist the evaluator in focusing on observing and recording exercise and drill events as they occur. FEMA will continue to review the Assessment Areas to allow for changes to the methodology dictated by changing times, methods, and environments.

The FEMA Regional Office is responsible for assigning the various Demonstration Criteria to each facility and/or functional entity that it will evaluate. Each FEMA Region must also track when evaluations of these facilities and/or functions occur, which Demonstration Criteria FEMA evaluated, and the status of that demonstration. Exhibit III-2 establishes the minimum frequency with which FEMA must evaluate each of the Demonstration Criteria. FEMA encourages OROs to voluntarily exercise certain criteria more frequently than the minimum frequencies for evaluation shown in the matrix.

The Assessment Areas with each Sub-element and associated Demonstration Criteria are as follows:

Demonstrating Reasonable Assurance

The Assessment Areas, derived from the NUREG-0654/FEMA-REP-1 Planning Standards and Evaluation Criteria, reflect current FEMA policy and guidance on the activities that OROs are expected to be able to perform to maintain reasonable assurance that the health and safety of the public can be protected in the event of an incident at an NPP.

1. **Emergency Operations Management**
   - Sub-element 1.a – Mobilization
     - Criterion 1.a.1
   - Sub-element 1.b – Facilities
     - Criterion 1.b.1
   - Sub-element 1.c – Direction and Control
     - Criterion 1.c.1
   - Sub-element 1.d – Communications Equipment
     - Criterion 1.d.1
   - Sub-element 1.e – Equipment and Supplies to Support Operations
     - Criterion 1.e.1
2. **Protective Action Decision-Making**
   - Sub-element 2.a – Emergency Worker Exposure Control
     - Criterion 2.a.1
   - Sub-element 2.b – Dose Assessment, PARs and PADs for the Emergency Event
     - Criterion 2.b.1
     - Criterion 2.b.2
   - Sub-element 2.c – PADs Consideration for the Protection of Persons with Disabilities and Access/Functional Needs
     - Criterion 2.c.1

- Sub-element 2.d – Radiological Assessment and Decision-Making for the Ingestion Exposure Pathway
  - Criterion 2.d.1
- Sub-element 2.e – Radiological Assessment and Decision-Making Concerning Post-Plume Phase Relocation, Reentry, and Return
  - Criterion 2.e.1

3. Protective Action Implementation

- Sub-element 3.a – Implementation of emergency worker Exposure Control
  - Criterion 3.a.1
- Sub-element 3.b –Implementation of KI Decision for Institutionalized Individuals and the Public
  - Criterion 3.b.1
- Sub-element 3.c – Implementation of Protective Actions for Persons with Disabilities and Access/ Functional Needs
  - Criterion 3.c.1
  - Criterion 3.c.2
- Sub-element 3.d – Implementation of Traffic and Access Control
  - Criterion 3.d.1
  - Criterion 3.d.2
- Sub-element 3.e – Implementation of Ingestion Pathway Decisions
  - Criterion 3.e.1
  - Criterion 3.e.2
- Sub-element 3.f – Implementation of Post-Plume Phase Relocation, Reentry, and Return Decisions
  - Criterion 3.f.1

4. Field Measurements and Analyses

- Sub-element 4.a – Plume Phase Field Measurements and Analyses
  - Criterion 4.a.1
  - Criterion 4.a.2
  - Criterion 4.a.3
- Sub-element 4.b – Post-Plume Phase Field Measurements and Sampling
  - Criterion 4.b.1
- Sub-element 4.c – Laboratory Operations
  - Criterion 4.c.1

5. Emergency Notification and Public Information

- Sub-element 5.a – Activation of the Prompt Alert and Notification System
  - Criterion 5.a.1
  - Criterion 5.a.2
  - Criterion 5.a.3
  - Criterion 5.a.4
- Sub-element 5.b – Emergency Information and Instructions for the Public and Media
  - Criterion 5.b.1

6. Support Operations/Facilities

- Sub-element 6.a – Monitoring, Decontamination, and Registration of Evacuees
  - Criterion 6.a.1
- Sub-element 6.b – Monitoring and Decontamination of Emergency Workers and their Equipment and Vehicles
  - Criterion 6.b.1
- Sub-element 6.c – Temporary Care of Evacuees
  - Criterion 6.c.1
- Sub-element 6.d – Transportation and Treatment of Contaminated Injured Individuals
  - Criterion 6.d.1

Assessment Area 1: Emergency Operations Management

Sub-element 1.a – Mobilization

INTENT

This Sub-element is derived from NUREG0654/FEMA-REP-1, which requires that OROs have the capability to alert, notify, and mobilize emergency personnel, and activate and staff emergency facilities.

> ***Criterion 1.a.1: OROs use effective procedures to alert, notify, and mobilize emergency personnel and activate facilities in a timely manner. (NUREG0654/FEMA-REP-1, A.1.a, e; A.3, 4; C.1,4, 6; D.4; E.1, 2; G.3.a; H.3, 4)***

ASSESSMENT/EXTENT OF PLAY

Assessment of this Demonstration Criterion may be accomplished during a biennial exercise, an actual event, out-of-sequence evaluation or by means of drills conducted at any time.

Responsible OROs must demonstrate the capability to receive notification of an incident from the licensee; verify the notification; and contact, alert, and mobilize key emergency personnel in a timely manner and demonstrate the ability to maintain and staff 24-hour operations. Twenty-four-hour operations can be demonstrated during the exercise via rosters or shift changes or otherwise in an actual activation. Local responders must demonstrate the ability to receive and/or initiate notification to the licensees or other respective emergency management organizations of an incident in a timely manner, when they receive information from the licensee or alternate sources. Responsible OROs must demonstrate the activation of facilities for immediate use by mobilized personnel upon their arrival. Activation of facilities and staff, including those associated with the ICS, must be completed in accordance with ORO plans/procedures. The location and contact information for facilities included in the incident command must be available to all appropriate responding agencies and the NPP after these facilities have been activated.

Pre-positioning of emergency personnel is appropriate, in accordance with the Extent-of-Play Agreement, at those facilities located beyond a normal commuting distance from the individual's duty location or residence. This includes the staggered release of resources from an assembly area. Additionally, pre-positioning of staff for out-of-sequence demonstrations may be used in accordance with the Extent-of-Play Agreement.

The REP program does not evaluate Incident Command Post tactical operations (e.g., Law Enforcement hostile action suppression techniques), only coordination among the incident command, the utility, and all appropriate OROs, pursuant to plans/procedures.

Initial law enforcement, fire service, HAZMAT, and emergency medical response to the NPP site may impact the ability to staff REP functions. The ability to identify and request additional resources or identify compensatory measures must be demonstrated. Exercises must also address the role of mutual aid in the incident, as appropriate. An integral part of the response to an HAB scenario at an NPP may also be within the auspices of the Federal Government (e.g., FBI, NRC, or DHS). Protocols for requesting

Federal, State, local, and Tribal law enforcement support must be demonstrated, as appropriate. Any resources must be on the ORO's mobilization list so they can be contacted during an incident, if needed.

All activities must be based on the ORO's plans/procedures and completed as they would be in an actual emergency, unless noted above or otherwise specified in the Extent-of-Play Agreement.

Sub-element 1.b – Facilities

INTENT

This Sub-element is derived from NUREG0654/FEMA-REP-1, which requires that OROs have facilities to support the emergency response.

> ***Criterion 1.b.1: Facilities are sufficient to support the emergency response. (NUREG0654/FEMA-REP-1, G.3.a;H.3; J.10.h; J.12; K.5.b)***

ASSESSMENT/EXTENT OF PLAY

Assessment of this Demonstration Criterion may be accomplished during a biennial exercise, an actual event, SAVs, or by out-of-sequence evaluations.

Responsible OROs must demonstrate, no less than once every 8 years, the availability of facilities to support accomplishment of emergency operations (this includes all alternate and backup facilities). Evaluations are typically performed for EOCs and JICs, as well as other facilities such as reception/relocation centers. Some of the areas evaluated within the facilities are adequate space, furnishings,

lighting, restrooms, ventilation, access to backup power, and/or alternate facility, if required to support operations. Radio stations, laboratories, initial warning points and hospitals are not evaluated under 1.b.1.

In addition, facilities will be evaluated for this criterion during the first biennial exercise after any new or substantial changes in structure, equipment, or mission that affect key capabilities, as outlined in respective emergency plans/procedures. A substantial change is one that has a direct effect or impact on emergency response operations performed in those facilities. Examples of substantial changes include modifying the size or configuration of an emergency operations center, adding more function to a center, or changing the equipment available for use in a center.

All activities must be based on the ORO's plans/procedures and completed as they would be in an actual emergency, unless noted above or otherwise specified in the Extent-of-Play Agreement.

Sub-element 1.c – Direction and Control

INTENT

This Sub-element is derived from NUREG0654/FEMA-REP-1, which requires that OROs have the capability to control their overall response to an emergency.

> ***Criterion 1.c.1: Key personnel with leadership roles for the ORO provide direction and control to that part of the overall response effort for which they are responsible. (NUREG0654/FEMA-REP-1, A.1.d; A.2.a, b; A.3; C.4, 6)***

ASSESSMENT/EXTENT OF PLAY

Assessment of this Demonstration Criterion may be accomplished in a biennial or tabletop exercise.

Leadership personnel must demonstrate the ability to carry out the essential management functions of the response effort (e.g., keeping staff informed through periodic briefings and/or other means, coordinating with other OROs, and ensuring completion of requirements and requests.) Leadership must demonstrate the ability to prioritize resource tasking and replace/supplement resources (e.g., through MOUs or other agreements) when faced with competing demands for finite resources. Any resources identified through LOA/MOUs must be on the ORO's mobilization list so they may be contacted during an incident, if needed.

All activities must be based on the ORO's plans/procedures and completed as they would be in an actual emergency, unless noted above or otherwise specified in the Extent-of-Play Agreement.

Sub-element 1.d – Communications Equipment

INTENT

This Sub-element is derived from NUREG0654/FEMA-REP-1, which requires that OROs establish and operate reliable primary and backup communication systems to ensure communications with key emergency personnel at locations such as contiguous governments within the EPZ, Federal emergency response organizations, the licensee and its facilities, EOCs, Incident Command Posts, and FMTs.

> ***Criterion 1.d.1: At least two communication systems are available, at least one operates properly, and communication links are established and maintained with appropriate locations. Communications capabilities are managed in support of emergency operations. (NUREG0654/FEMA-REP-1, F.1, 2)***

ASSESSMENT/EXTENT OF PLAY

Assessment of this Demonstration Criterion is accomplished initially in a baseline evaluation and subsequently in periodic testing and drills. System familiarity and use must be demonstrated as applicable in biennial or tabletop exercise, or if their use would be required, during an actual event.

OROs must demonstrate that a primary system, and at least one backup system for fixed facilities, is fully functional at all times. Communications systems are maintained and tested on a recurring basis throughout the assessment period and system status is available to all operators. Periodic test results and corrective actions are maintained on a real time basis. If a communications system or systems are not functional, but exercise performance is not affected, no exercise issue will be assessed.

Communications equipment and procedures for facilities and field units are used as needed for transmission and receipt of exercise messages. All facilities, FMTs, and incident command must have the capability to access at least one communication system that is independent of the commercial telephone system. Responsible OROs must demonstrate the capability to manage the communication systems and ensure that all message traffic is handled without delays that might disrupt emergency operations. OROs must ensure that a coordinated communication link for fixed and mobile medical support facilities

exists. Exercise scenarios may require the failure of a communication system and use of an alternate system, as negotiated in the Extent-of-Play Agreement.

All activities must be based on the ORO's plans/procedures and completed as they would be in an actual emergency, unless noted above or otherwise specified in the Extent-of-Play Agreement.

Sub-element 1.e – Equipment and Supplies to Support Operations

INTENT

This Sub-element is derived from NUREG-0654/FEMA-REP-1, which requires that OROs have emergency equipment and supplies adequate to support the emergency response.

> ***Criterion 1.e.1: Equipment, maps, displays, monitoring instruments, dosimetry, potassium iodide (KI) and other supplies are sufficient to support emergency operations (NUREG-0654/FEMA-REP-1, H.7, 10; I.7, 8, 9; J.10.a, b, e; J.11, 12; K.3.a; K.5.b)***

ASSESSMENT/EXTENT OF PLAY

Assessment of this Demonstration Criterion is accomplished primarily through a baseline evaluation and subsequent periodic inspections.

A particular facility's equipment and supplies must be sufficient and consistent with that facility's assigned role in the ORO's emergency operations plans. Use of maps and other displays is encouraged. For non-facility-based operations, the equipment and supplies must be sufficient and consistent with the assigned operational role. At locations where traffic and access control personnel are deployed, appropriate equipment (e.g., vehicles, barriers, traffic cones, and signs) must be available, or their availability described.

Specific equipment and supplies that must be demonstrated under this criterion include KI inventories, dosimetry, and monitoring equipment, as follows:

KI: Responsible OROs must demonstrate the capability to maintain inventories of KI sufficient for use by: (1) emergency workers; (2) institutionalized individuals, as indicated in capacity lists for facilities; and (3) where stipulated by the plans/procedures, members of the general public (including transients) within the plume pathway EPZ. In addition, OROs must demonstrate provisions to make KI available to specialized response teams (e.g., civil support team, Special Weapons and Tactics Teams, urban search and rescue, bomb squads, HAZMAT, or other ancillary groups) as identified in plans/procedures). The plans/procedures must include the forms to be used for documenting emergency worker ingestion of KI, as well as a mechanism for identifying emergency workers that have declined KI in advance. Consider carefully the placement of emergency workers that have declined KI in advance.

ORO quantities of dosimetry and KI available and storage locations(s) will be confirmed by physical inspection at the storage location(s) or through documentation of current inventory submitted during the exercise, provided in the ALC submission, and/or verified during an SAV. Available supplies of KI must be within the expiration date indicated on KI bottles or blister packs. As an alternative, the ORO may produce a letter from a certified private or State laboratory indicating that the KI supply remains potent, in accordance with U.S. Pharmacopoeia standards.[94]

Dosimetry: Sufficient quantities of appropriate direct-reading and permanent record dosimetry and dosimeter chargers must be available for issuance to all emergency workers who will be dispatched to perform an ORO mission. In addition, OROs must demonstrate provisions to make dosimetry available to specialized response teams (e.g., civil support team, Special Weapons and Tactics Teams, urban search and rescue, bomb squads, HAZMAT, or other ancillary groups) as identified in plans/procedures).

Appropriate direct-reading dosimetry must allow an individual(s) to read the administrative reporting limits and maximum exposure limits contained in the ORO's plans/procedures.

Direct-reading dosimeters must be zeroed or operationally checked prior to issuance. The dosimeters must be inspected for electrical leakage at least annually and replaced when necessary. Civil Defense Victoreen Model 138s (CD V-138s) (0-200 mR), due to their documented history of electrical leakage problems, must be inspected for electrical leakage at least quarterly and replaced when necessary. This leakage testing will be verified during the exercise, through documentation submitted in the ALC and/or through an SAV.

[94] See part IV, REP Program Administration: Potassium Iodide (KI) for the Public – Requirements.

Operational checks and testing of electronic dosimeters must be in accordance with the manufacturer's instructions and be verified during the exercise, through documentation submitted in the ALC and/or through an SAV.

Monitoring Instruments: All instruments must be inspected, inventoried, and operationally checked before each use. Instruments must be calibrated in accordance with the manufacturer's recommendations. Unmodified CDV-700 series instruments and other instruments without a manufacturer's recommendation must be calibrated annually. Modified CDV-700 instruments must be calibrated in accordance with the recommendation of the modification manufacturer. A label indicating such calibration must be on each instrument or calibrated frequency can be verified by other means. In addition, instruments being used to measure activity must have a sticker-affixed to their sides indicating the effective range of the readings. The range of readings documentation specifies the acceptable range of readings that the meter should indicate when it is response-checked using a standard test source.

For FMTs, the instruments must be capable of measuring gamma exposure rates and detecting beta radiation. These instruments must be capable of measuring a range of activity and exposure, including radiological protection/exposure control of team members and detection of activity on air sample collection media, consistent with the intended use of the instrument and the ORO's plans/procedures. An appropriate radioactive check source must be used to verify proper operational response for each low-range radiation measurement instrument (less than 1R/hr) and for high-range instruments when available. If a source is not available for a high-range instrument, a procedure must exist to operationally test the instrument before entering an area where only a high-range instrument can make useful readings.

In areas where portal monitors are used, the OROs must set up and operationally check the monitor(s). The monitor(s) must conform to the standards set forth in the *Contamination Monitoring Standard for a Portal Monitor Used for Emergency Response*, FEMA-REP-21 (March 1995) or in accordance with the manufacturer's recommendations.

All activities must be based on the ORO's plans/procedures and completed as they would be in an actual emergency, unless noted above or otherwise specified in the Extent-of-Play Agreement.

Assessment Area 2: Protective Action Decision-Making

Sub-element 2.a – Emergency Worker Exposure Control

INTENT

This Sub-element is derived from NUREG0654/FEMA-REP-1, which requires that OROs have the capability to assess and control the radiation exposure received by emergency workers and have a decision chain in place, as specified in the ORO's plans/procedures, to authorize emergency worker exposure limits to be exceeded for specific missions.

Radiation exposure limits for emergency workers are the recommended accumulated dose limits or exposure rates that emergency workers may be permitted to incur during an emergency. These limits include any pre-established administrative reporting limits (that take into consideration TEDE or organ-specific limits) identified in the ORO's plans/procedures.

> ***Criterion 2.a.1: OROs use a decision-making process, considering relevant factors and appropriate coordination, to ensure that an exposure control system, including the use of KI, is in place for emergency workers, including provisions to authorize radiation exposure in excess of administrative limits or protective action guides. (NUREG0654/FEMA-REP-1, C.6; f; K.3.a; K.4)***

ASSESSMENT/EXTENT OF PLAY

Assessment of this Demonstration Criterion must be assessed concurrently with a licensee exercise and may be demonstrated in a biennial or tabletop exercise.

OROs authorized to send emergency workers into the plume exposure pathway EPZ must demonstrate a capability to comply with emergency worker exposure limits based on their emergency plans/procedures.

Participating OROs must also demonstrate the capability to make decisions concerning authorization of exposure levels in excess of pre-authorized levels and the number of emergency workers receiving radiation doses above pre-authorized levels. This would include providing KI and dosimetry in a timely manner to emergency workers dispatched onsite to support plant incident assessment and mitigating actions, in accordance with respective plans/procedures.

As appropriate, OROs must demonstrate the capability to make decisions on the distribution and administration of KI as a protective measure for emergency workers, based on their plans/procedures or projected thyroid dose compared with the established PAGs for KI administration.

All activities must be based on the ORO's plans/procedures and completed as they would be in an actual emergency, unless noted above or otherwise specified in the Extent-of-Play Agreement.

Sub-element 2.b. – Radiological Assessment and Protective Action Recommendations and Decisions for the Plume Phase of the Emergency

INTENT

This Sub-element is derived from NUREG0654/FEMA-REP-1, which requires that OROs have the capability to independently project integrated dose from projected or actual dose rates and compare these estimates to the PAGs.

OROs must have the capability to choose, among a range of protective actions, those most appropriate in a given emergency. OROs base these choices on PAGs from their plans/procedures or EPA's *Manual of Protective Action Guides and Protective Actions for Nuclear Incidents* and other criteria, such as plant conditions, licensee PARs, coordination of PADs with other political jurisdictions (e.g., other affected OROs and incident command), availability of in-place shelter, weather conditions, and situations, to include HAB incidents, the threat posed by the specific hostile action, the affiliated response, and the effect of an evacuation on the threat response effort, that create higher than normal risk from general population evacuation.

> ***Criterion 2.b.1: Appropriate protective action recommendations (PARs) are based on available information on plant conditions, field monitoring data, and licensee and ORO dose projections, as well as knowledge of onsite and offsite environmental conditions. (NUREG0654/FEMA-REP-1, I.10 and Supplement 3)***

ASSESSMENT/EXTENT OF PLAY

Assessment of this Demonstration Criterion must be accomplished concurrently with a licensee exercise and may be demonstrated in a biennial or tabletop exercise.

During the initial stage of the emergency response, following notification of plant conditions that may warrant offsite protective actions, the ORO must demonstrate the capability to use appropriate means, described in the plans/procedures, to develop PARs for decision-makers based on available information and recommendations provided by the licensee as well as field monitoring data, if available. The ORO must also consider any release and meteorological data provided by the licensee.

The ORO must demonstrate a reliable capability to independently validate dose projections. The types of calculations to be demonstrated depend on the data available and the need for assessments to support the PARs must be appropriate to the scenario. In all cases, calculation of projected dose must be demonstrated. Projected doses must be related to quantities and units of the PAG to which they will be compared. PARs must be promptly transmitted to decision-makers in a prearranged format.

When the licensee and ORO projected doses differ by more than a factor of 10, the ORO and licensee must determine the source of the difference by discussing input data and assumptions, using different models, or exploring possible reasons. Resolution of these differences must be incorporated into the PARs if timely and appropriate. The ORO must demonstrate the capability to use any additional data to refine projected doses and exposure rates and revise the associated PARs.

All activities must be based on the ORO's plans/procedures and completed as they would be in an actual emergency, unless noted above or otherwise specified in the Extent-of-Play Agreement.

> **Criterion 2.b.2:** ***A decision-making process involving consideration of appropriate factors and necessary coordination is used to make protective action decisions (PADs) for the general public (including the recommendation for the use of KI, if ORO policy). (NUREG0654/FEMA-REP-1,A.3; C.4, 6; D.4; J.9; J.10.e, f; m)***

ASSESSMENT/EXTENT OF PLAY

Assessment of this Demonstration Criterion must be accomplished concurrently with a licensee exercise and may be demonstrated in a biennial or tabletop exercise.

OROs must have the capability to make both initial and subsequent PADs. OROs must demonstrate the capability to make initial PADs in a timely manner appropriate to the incident, based on information from the licensee, assessment of plant status and potential or actual releases, other available information related to the incident, input from appropriate ORO authorities (e.g., incident command), and PARs from the utility and ORO staff. In addition, a subsequent or alternate PAD may be appropriate if various conditions (e.g., an HAB incident, weather, release timing and magnitude) pose undue risk to an evacuation, or if evacuation may disrupt the efforts to respond to a hostile action.

OROs must demonstrate the ability to obtain supplemental resources (e.g., mutual aid) necessary to implement a PAD if local law enforcement, fire service, HAZMAT, and emergency medical resources are used to augment response to the NPP site or other key infrastructure.

Dose assessment personnel may provide additional PARs based on the subsequent dose projections, field monitoring data, or information on plant conditions. In addition, incident command must provide input regarding considerations for subsequent PARs based on the magnitude of the ongoing threat, the response, and/or site conditions. The decision-makers must demonstrate the capability to change protective actions based on the combination of all these factors.

If the ORO has determined that KI will be used as a protective measure for the general public under offsite plans/procedures, then it must demonstrate the capability to make decisions on the distribution and administration of KI to supplement sheltering and evacuation. This decision must be based on the ORO's plans/procedures or projected thyroid dose compared with the established PAG for KI administration. The KI decision-making process must involve close coordination with appropriate assessment and decision-making staff.

If more than one ORO is involved in decision making, all appropriate OROs must communicate and coordinate PADs with each other. In addition, decisions must be coordinated/communicated with incident command. OROs must demonstrate the capability to communicate the results of decisions to all the affected locations.

All activities must be based on the ORO's plans/procedures and completed as they would be in an actual emergency, unless noted above or otherwise specified in the Extent-of-Play Agreement.

Sub-element 2.c – PAD Consideration for the Protection of Persons with Disabilities and Access/Functional Needs

INTENT

This Sub-element is derived from NUREG0654/FEMA-REP-1, which requires that OROs have the capability to determine PADs, including evacuation, sheltering, and use of KI, if applicable, for groups of persons with disabilities and access/functional needs (e.g., hospitals, nursing homes, correctional facilities, schools, licensed day cares, mobility-impaired individuals, and transportation-dependent individuals). The focus is on those groups of persons with disabilities and access/functional needs that are, or potentially will be, affected by a radiological release from an NPP.

> ***Criterion 2.c.1: Protective action decisions are made, as appropriate, for groups of persons with disabilities and access/functional needs. (NUREG0654/FEMA-REP-1,D.4; J.9; J.10.d, e)***

ASSESSMENT/EXTENT OF PLAY

Assessment of this Demonstration Criterion must be accomplished concurrently with a licensee exercise and may be demonstrated in a biennial or tabletop exercise that would include the use of plant conditions transmitted from the licensee.

Usually it is appropriate to implement evacuation in areas where doses are projected to exceed the lower end of the range of PAGs, except for incidents where there is a high-risk environmental condition or where high-risk groups (e.g., the immobile or infirm) are involved. In these cases, factors that must be considered include weather conditions, shelter availability, availability of transportation assets, risk of evacuation versus risk from the avoided dose, and precautionary school evacuations. In addition, decisions must be coordinated/communicated with the incident command. In situations where an institutionalized population cannot be evacuated, the ORO must consider use of KI.

Applicable OROs must demonstrate the capability to alert and notify all public school systems/districts of emergency conditions that are expected to or may necessitate protective actions for students. Demonstration requires that the OROs actually contact public school systems/districts during the exercise.

In accordance with plans/procedures, OROs and/or officials of public school systems/districts must demonstrate the capability to make prompt decisions on protective actions for students. The decision-making process, including any preplanned strategies for protective actions for that ECL, must consider the location of students at the time (e.g., whether the students are still at home, en route to school, or at school).

Since other agencies place requirements on hospitals to prepare for contaminated patients, the REP Program has no need to evaluate host hospitals[95], nor does the ORO have the responsibility to provide training or dosimetry. Additionally Hospital evacuation plans do not need to be reviewed or tested by the REP program.

All activities must be based on the ORO's plans/procedures and completed as they would be in an actual emergency, unless noted above or otherwise specified in the Extent-of-Play Agreement.

Sub-element 2.d. – Radiological Assessment and Decision Making for the Ingestion Exposure Pathway

INTENT

This Sub-element is derived from NUREG0654/FEMA-REP-1, which requires that OROs have the means to assess the radiological consequences for the ingestion exposure pathway, relate them to the appropriate PAGs, and make timely, appropriate PADs to mitigate exposure from the pathway.

During an incident at an NPP, a release of radioactive material may contaminate water supplies and agricultural products in the surrounding areas. Any such contamination would likely occur during the plume phase of the incident and, depending on the nature of the release, could impact the ingestion pathway for weeks or years.

> ***Criterion 2.d.1: Radiological consequences for the ingestion pathway are assessed and appropriate protective action decisions are made based on the ORO's planning criteria. (NUREG0654/FEMA-REP-1, A.3; C.1, 4; D.4; J.9,11)***

ASSESSMENT/EXTENT OF PLAY

Assessment of this Demonstration Criterion must be accomplished concurrently with a licensee exercise and may be demonstrated in a biennial or tabletop exercise that would include the use of plant conditions transmitted from the licensee.

[95] In this context, "host hospital" refers to a hospital that may treat patients potentially contaminated with radiation.

OROs are expected to take precautionary actions to protect food and water supplies, or to minimize exposure to potentially contaminated water and food, in accordance with their respective plans/procedures. Often OROs initiate such actions based on criteria related to the facility's ECLs. Such actions may include recommendations to place milk animals on stored feed and use protected water supplies.

The ORO must use its procedures to assess the radiological consequences of a release on the food and water supplies, such as the development of a sampling plan. The ORO's assessment must include evaluation of the radiological analyses of representative samples of water, food, and other ingestible substances of local interest from potentially impacted areas; characterization of the releases from the facility; and the extent of areas potentially impacted by the release. During this assessment, OROs must consider use of agricultural and watershed data within the 50-mile EPZ. The radiological impacts on the food and water must then be compared to the appropriate ingestion PAGs contained in the ORO's plans/procedures. The plans/procedures contain PAGs based on specific dose commitment criteria or on criteria as recommended by current Food and Drug Administration (FDA) guidance. Timely and appropriate recommendations must be provided to the ORO decision-makers group for implementation decisions. OROs may also include a comparison of taking or not taking a given action on the resultant ingestion pathway dose commitments.

The ORO must demonstrate timely decisions to minimize radiological impacts from the ingestion pathway, based on the given assessments and other information. Any such decisions must be communicated and, to the extent practical, coordinated with neighboring OROs. These decisions include tracking agricultural products entering and leaving the EPZ. Demonstration of plans and procedures which use traffic access control points to track agricultural products entering and leaving the EPZ may be conducted through interview.

OROs will use Federal resources, as identified in the Nuclear/Radiological Incident Annex of the NRF and other resources (e.g., compacts or nuclear insurers), as necessary. Evaluation of this criterion will take into consideration the level of Federal and other participating resources.

All activities must be based on the ORO's plans/procedures and completed as they would be in an actual emergency, unless noted above or otherwise specified in the Extent-of-Play Agreement.

Sub-element 2.e. – Radiological Assessment and Decision Making Concerning Post-Plume Phase Relocation, Reentry, and Return

INTENT

This Sub-element is derived from NUREG0654/FEMA-REP-1, which requires that OROs have the capability to make decisions on post-plume phase *relocation*, *reentry*, and *return* of the general public. These decisions are essential for protection of the public from direct long-term exposure to deposited radioactive materials from a severe incident at an NPP.

> ***Criterion 2.e.1: Timely post-plume phase relocation, reentry, and return decisions are made and coordinated as appropriate, based on assessments of the radiological conditions and criteria in the ORO's plan and/or procedures. (NUREG0654/FEMA-REP-1, I.10; J.9; K.3.a; M.1)***

ASSESSMENT/EXTENT OF PLAY

Assessment of this Demonstration Criterion must be accomplished concurrently with a licensee exercise and may be demonstrated in a biennial or tabletop exercise that would include the use of plant conditions transmitted from the licensee.

Relocation: OROs must demonstrate the capability to estimate integrated dose in contaminated areas and compare these estimates with PAGs; apply decision criteria for relocation of those individuals in the general public who have not been evacuated, but where actual or projected doses are in excess of relocation PAGs; and control access to evacuated and restricted areas. OROs will make decisions for relocating members of the evacuated public who lived in areas that now have residual radiation levels in excess of the PAGs. Determination of areas to be restricted must be based on factors such as the mix of radionuclides in deposited materials, calculated exposure rates versus the PAGs, and analyses of vegetation and soil field samples.

Reentry: Decisions must be made on location of control points and policies regarding access and exposure control for emergency workers and members of the general public who need to temporarily enter the evacuated area to perform specific tasks or missions.

Examples of control procedures are the assignment of, or checking for, direct-reading and permanent record dosimetry for emergency workers; questions regarding an individual's objectives, locations expected to be visited,

and associated timeframes; availability of maps and plots of radiation exposure rates; and advice on areas to avoid. Control procedures also include monitoring of individuals, vehicles, and equipment; the implementation of decision criteria regarding decontamination; and proper disposition of emergency worker dosimetry and maintenance of emergency worker radiation exposure records.

Responsible OROs must demonstrate the capability to develop a strategy for authorized reentry of individuals into the restricted zone(s), based on established decision criteria. OROs must demonstrate the capability to modify those policies for security purposes (e.g., police patrols), maintenance of essential services (e.g., fire protection and utilities), and other critical functions. They must demonstrate the capability to use decision-making criteria in allowing access to the restricted zone by the public for various reasons, such as to maintain property (e.g., to care for farm animals or secure machinery for storage) or retrieve important possessions. Coordinated policies for access and exposure control must be developed among all agencies with roles to perform in the restricted zone(s). OROs must demonstrate the capability to establish policies for provision of dosimetry to all individuals allowed to reenter the restricted zone(s). The extent to which OROs need to develop policies on reentry will be determined by scenario events.

Return: OROs must demonstrate the capability to implement policies concerning return of members of the public to areas that were evacuated during the plume phase (i.e., permitting populations that were previously evacuated to reoccupy their homes and businesses on an unrestricted basis). OROs must base decisions on environmental data and political boundaries or physical/ geological features, which allow identification of the boundaries of areas to which members of the general public may return. Return is permitted to the boundary of the restricted area(s) that is based on the relocation PAG.

Other factors that the ORO must consider in decision-making include conditions that permit cancellation of the ECL and relaxation of associated restrictive measures. OROs must base return recommendations on measurements of radiation from ground deposition. OROs must have the capability to identify services and facilities that require restoration within a few days and to identify the procedures and resources for their restoration. Examples of these services and facilities are medical and social services, utilities, roads, schools, and intermediate-term housing for relocated persons.

All activities must be based on the ORO's plans/procedures and completed as they would be in an actual emergency, unless noted above or otherwise specified in the Extent-of-Play Agreement.

Assessment Area 3: Protective Action Implementation

Sub-element 3.a – Implementation of Emergency Worker Exposure Control

INTENT

This Sub-element is derived from NUREG0654/FEMA-REP-1, which requires that OROs have the capability to provide for the following: distribution, use, collection, and processing of direct-reading dosimetry and permanent record dosimetry; reading of direct-reading dosimetry by emergency workers at appropriate frequencies; maintaining a radiation dose record for each emergency worker; establishing a decision chain or authorization procedure for emergency workers to incur radiation exposures in excess of the PAGs, and the capability to provide KI for emergency workers, always applying the "as low as is reasonably achievable" principle as appropriate.

> ***Criterion 3.a.1: The OROs issue appropriate dosimetry,KI, and procedures, and manage radiological exposure to emergency workers in accordance with the plans/procedures. Emergency workers periodically and at the end of each mission read their dosimeters and record the readings on the appropriate exposure record or chart. OROs maintain appropriate record-keeping of the administration of KI to emergency workers. (NUREG-0654/FEMA-REP-1, K.3.a, b; K.4)***

ASSESSMENT/EXTENT OF PLAY

Assessment of this Demonstration Criterion may be accomplished during a biennial or tabletop exercise. Other means may include drills, seminars or training activities that would fully demonstrate technical proficiency.

OROs must demonstrate the capability to provide emergency workers (including supplemental resources) with the appropriate direct-reading and permanent record dosimetry, dosimeter chargers, KI, and instructions on the use of these items. For evaluation purposes, appropriate direct-reading dosimetry is defined as dosimetry that allows an individual(s) to read the administrative reporting limits that are pre-established at a level low enough to consider subsequent calculation of TEDE and maximum exposure limits, for those emergency workers involved in lifesaving activities, contained in the ORO's plans/procedures.

Each emergency worker must have basic knowledge of radiation exposure limits as specified in the ORO's plans/procedures. If supplemental resources are used, they must be provided with just-in-time training to ensure basic knowledge of radiation exposure control. Emergency workers must demonstrate procedures to monitor and record dosimeter readings and manage radiological exposure control.

During a plume phase exercise, emergency workers must demonstrate the procedures to be followed when administrative exposure limits and turn-back values are reached. The emergency worker must report accumulated exposures during the exercise as indicated in the plans/procedures. OROs must demonstrate the actions described in the plans/procedures by determining whether to replace the worker, authorize the worker to incur additional exposures, or take other actions. If exercise play does not require emergency workers to seek authorizations for additional exposure, evaluators must interview at least two workers to determine their knowledge of whom to contact in case authorization is needed, and at what exposure levels. Workers may use any available resources (e.g., written procedures and/or coworkers) in providing responses.

Although it is desirable for all emergency workers to each have a direct-reading dosimeter, there may be situations where team members will be in close proximity to each other during the entire mission. In such cases, adequate control of exposure can be achieved for all team members using one direct-reading dosimeter worn by the team leader. Emergency workers assigned to low-exposure rate fixed facilities (e.g., EOCs and communications center within the EPZ, reception centers, and counting laboratories) may have individual direct-reading dosimeters or they may be monitored using group dosimetry (i.e., direct-reading dosimeters strategically placed in the work area). Each team member must still have his or her own permanent record dosimetry. Individuals authorized by the ORO to reenter an evacuated area during the plume (emergency) phase, must be limited to the lowest radiological exposure commensurate with completing their missions.

OROs may have administrative limits lower than EPA-400-R-92-001 dose limits for emergency workers performing various services (e.g., lifesaving, protection of valuable property, all activities). OROs must ensure that the process used to seek authorization for exceeding dose limits does not negatively impact the capability to respond to an incident where lifesaving and/or protection of valuable property may require an urgent response.

OROs must demonstrate the capability to accomplish distribution of KI to emergency workers consistent with decisions made. OROs must have the capability to develop and maintain lists of emergency workers who have ingested KI, including documentation of the date(s) and time(s) they did so. Ingestion of KI recommended by the designated ORO health official is voluntary. For evaluation purposes, the actual ingestion of KI shall not be performed. OROs must demonstrate the capability to formulate and disseminate instructions on using KI for those advised to take it. Emergency workers must demonstrate basic knowledge of procedures for using KI whether or not the scenario drives the implementation of KI use. This can be accomplished by an interview with the evaluator.

All activities must be based on the ORO's plans/procedures and completed as they would be in an actual emergency, unless noted above or otherwise specified in the Extent-of-Play Agreement.

Sub-element 3.b – Implementation of KI Decision for Institutionalized Individuals and the General Public

INTENT

This Sub-element is derived from NUREG0654/FEMA-REP-1, which requires that OROs have the capability to provide KI for institutionalized individuals, and, if in the plans/procedures, to the general public for whom immediate evacuation may not be feasible, very difficult, or significantly delayed. While it is necessary for OROs to have the capability to provide KI to institutionalized individuals, providing KI to the general public is an ORO option and must be reflected as such in ORO plans/procedures. Provisions must include the availability of adequate quantities, storage, and means of distributing KI.

> ***Criterion 3.b.1: KI and appropriate instructions are available if a decision to recommend use of KI is made. Appropriate record-keeping of the administration of KI for institutionalized individuals is maintained. (NUREG0654/FEMA-REP-1, J.10.e, f)***

ASSESSMENT/EXTENT OF PLAY

Assessment of this Demonstration Criterion may be accomplished during a biennial or tabletop exercise. Other means may include drills, seminars or training activities that would fully demonstrate technical proficiency.

OROs must demonstrate the capability to make KI available to institutionalized individuals, and, where provided for in their plans/procedures, to members of the general public. OROs must demonstrate the capability to accomplish distribution of KI consistent with decisions made. OROs must have the capability to develop and maintain lists of institutionalized individuals who have ingested KI, including documentation of the date(s) and time(s) they were instructed to ingest KI. Ingestion of KI recommended by the designated ORO health official is voluntary. For evaluation purposes, the actual ingestion of KI shall not be performed. OROs must demonstrate the capability to formulate and disseminate instructions on using KI for those advised to take it.

If a recommendation is made for the general public to take KI, appropriate information must be provided to the public by the means of notification specified in the ORO's plans/procedures.

All activities must be based on the ORO's plans/procedures and completed as they would be in an actual emergency, unless noted above or otherwise specified in the Extent-of-Play Agreement.

Sub-element 3.c – Implementation of Protective Actions for Persons with Disabilities and Access/Functional Needs

INTENT

This Sub-element is derived from NUREG0654/FEMA-REP-1, which requires that OROs have the capability to implement PADs, including evacuation and/or sheltering, for all persons with disabilities and access/functional needs. The focus is on those persons with disabilities and access/functional needs that are (or potentially will be) affected by a radiological release from an NPP.

> ***Criterion 3.c.1: Protective action decisions are implemented for persons with disabilities and access/functional needs other than schools within areas subject to protective actions. (NUREG0654/FEMA-REP-1, J.10.c, d, e, g)***

ASSESSMENT/EXTENT OF PLAY

Assessment of this Demonstration Criterion may be accomplished during a biennial exercise, an actual event, or by means of drills conducted at any time.

Applicable OROs must demonstrate the capability to alert and notify (i.e., provide PARs and emergency information

and instructions to) persons with disabilities and access/functional needs, including hospitals/medical facilities, nursing homes, correctional facilities, and mobility-impaired and transportation-dependent individuals. OROs must demonstrate the capability to provide for persons with disabilities and access/functional needs in accordance with plans/procedures.

Contact with persons with disabilities and access/functional needs and reception facilities may be actual or simulated, as agreed to in the extent of play. Some contacts with transportation providers must be actually contacted, as negotiated in the extent of play. All actual and simulated contacts must be logged.

Since other agencies place requirements on hospitals to prepare for contaminated patients, the REP Program has no need to evaluate host hospitals, nor does the ORO have the responsibility to provide training or dosimetry. Additionally Hospital evacuation plans do not need to be reviewed or tested by the REP program.

All activities must be based on the ORO's plans/procedures and completed as they would be in an actual emergency, unless noted above or otherwise specified in the Extent-of-Play Agreement.

> ***Criterion 3.c.2: OROs/School officials implement protective actions for schools. (NUREG0654/FEMA-REP-1, J.10.c, d, e, g)***

ASSESSMENT/EXTENT OF PLAY

Assessment of this Demonstration Criterion may be accomplished during a biennial, or tabletop exercise, an actual event, staff assistance visit, or by means of drills conducted at any time.

School systems/districts (these include public and private schools, kindergartens, preschools, and licensed day cares) must demonstrate the ability to implement PADs for students. The demonstration must be made as follows: Each school system/district within the 10 mile EPZ must demonstrate implementation of protective actions. At least one school per affected system/district must participate in the demonstration. Canceling the school day, dismissing early, or sheltering in place must be simulated by describing to evaluators the procedures that would be followed. If evacuation is the implemented protective action, all activities to coordinate and complete the evacuation of students to reception centers, congregate care centers, or host schools may actually be demonstrated or accomplished through an interview process.

If accomplished through an interview, appropriate school personnel including decision-making officials (e.g., schools' superintendent/principals and transportation director/bus dispatchers), and at least one bus driver (and the bus driver's escort, if applicable) must be available to demonstrate knowledge of their role(s) in the evacuation of school children. Communications capabilities between school officials and the buses, if required by the plans/procedures, must be verified.

Officials of the school system(s) must demonstrate the capability to develop and provide timely information to OROs for use in messages to parents, the general public, and the media on the status of protective actions for schools.

If a school facility has emergency plans as a condition of licensing, those plans may be submitted to FEMA review in place of demonstration or interview pursuant to the ORO's plans/procedures as negotiated in the Extent-of-Play Agreement.

Since other agencies place requirements on hospitals to prepare for contaminated patients, the REP Program has no need to evaluate host hospitals, nor does the ORO have the responsibility to provide training or dosimetry. Additionally Hospital evacuation plans do not need to be reviewed or tested by the REP program.

All activities must be based on the ORO's plans/procedures and completed as they would be in an actual emergency, unless noted above or otherwise specified in the Extent-of-Play Agreement.

Sub-element 3.d. – Implementation of Traffic and Access Control

INTENT

This Sub-element is derived from NUREG0654/FEMA-REP-1, which requires that OROs have the capability to implement protective action plans/procedures, including relocation and restriction of access to evacuated/sheltered areas. This Sub-element focuses on selecting, establishing, and staffing of traffic and access control points, and removal of impediments to the flow of evacuation traffic.

> ***Criterion 3.d.1: Appropriate traffic and access control is established. Accurate instructions are provided to traffic and access control personnel. (NUREG0654/FEMA-REP-1, A.3; C.1,4; J.10.g, j)***

ASSESSMENT/EXTENT OF PLAY

Assessment of this Demonstration Criterion may be accomplished during a biennial exercise, an actual event, staff assistance visit, or by means of drills conducted at any time.

OROs must demonstrate the capability to select, establish, and staff appropriate traffic and access control points consistent with current conditions and PADs (e.g., evacuating, sheltering, and relocation) in a timely manner. OROs must demonstrate the capability to provide instructions to traffic and access control staff on actions to take when modifications in protective action strategies necessitate changes in evacuation patterns or in the area(s) where access is controlled.

Traffic and access control staff must demonstrate accurate knowledge of their roles and responsibilities, including verifying emergency worker identification and access authorization to the affected areas, as per the Extent-of-Play Agreement. These capabilities may be demonstrated by actual deployment or by interview, in accordance with the Extent-of-Play Agreement.

In instances where OROs lack authority necessary to control access by certain types of traffic (e.g., rail, water, and air traffic), they must demonstrate the capability to contact the State or Federal agencies that have the needed authority, as agreed upon in the Extent-of-Play Agreement.

All activities must be based on the ORO's plans/procedures and completed as they would be in an actual emergency, unless noted above or otherwise specified in the Extent-of-Play Agreement.

> ***Criterion 3.d.2: Impediments to evacuation are identified and resolved. (NUREG0654/FEMA-REP-1, J.10.k)***

ASSESSMENT/EXTENT OF PLAY

Assessment of this Demonstration Criterion may be accomplished during a biennial exercise, an actual event, staff assistance visit, or by means of drills conducted at any time.

OROs must demonstrate the capability to identify and take appropriate actions concerning impediments to evacuations. In demonstrating this capability, the impediment must remain in place during the evacuation such that re-routing of traffic is required and must also result in demonstration of decision-making and coordination with the JIC to communicate the alternate route to evacuees. Where, due to specifics of the scenario or jurisdiction, the impediment cannot be located on an evacuation route, it must be located so as to impact the evacuation. Where not possible, actual dispatch of resources need not be physically demonstrated; however, all contacts, actual or simulated, must be logged.

All activities must be based on the ORO's plans/procedures and completed as they would be in an actual emergency, unless noted above or otherwise specified in the Extent-of-Play Agreement.

Sub-element 3.e – Implementation of Ingestion Pathway Decisions

INTENT

This Sub-element is derived from NUREG0654/FEMA-REP-1, which requires that OROs have the capability to implement protective actions, based on criteria recommended by current FDA guidance, for the ingestion exposure pathway EPZ (i.e., the area within an approximate 50-mile radius of the NPP). This Sub-element focuses on those actions required for implementation of protective actions.

> ***Criterion 3.e.1: The ORO demonstrates the availability and appropriate use of adequate information regarding water, food supplies, milk, and agricultural production within the ingestion exposure pathway emergency planning zone for implementation of protective actions. (NUREG0654/FEMA-REP-1, A.3; C.1, 4; J.11)***

ASSESSMENT/EXTENT OF PLAY

Assessment of this Demonstration Criterion may be accomplished during a biennial exercise, an actual event, or by means of drills conducted at any time.

Applicable OROs must demonstrate the capability to secure and use current information on the locations of dairy farms, meat and poultry producers, fisheries, fruit growers, vegetable growers, grain producers, food processing plants, and water supply intake points to implement protective actions within the EPZ. OROs use Federal resources as identified in the NRF Nuclear/Radiological Incident Annex, and other resources (e.g., compacts, nuclear insurers), if available. Evaluation of this criterion will take into consideration the level of Federal and other resources participating in the exercise.

All activities must be based on the ORO's plans/procedures and completed as they would be in an actual emergency, unless noted above or otherwise specified in the Extent-of-Play Agreement.

> ***Criterion 3.e.2: Appropriate measures, strategies, and pre-printed instructional material are developed for implementing protective action decisions for contaminated water, food products, milk, and agricultural production. (NUREG0654/FEMA-REP-1, G.1, J.9, 11)***

ASSESSMENT/EXTENT OF PLAY

Assessment of this Demonstration Criterion may be accomplished during a biennial exercise, an actual event, or by means of drills conducted at any time.

OROs must demonstrate the development of measures and strategies for implementation of ingestion exposure pathway EPZ protective actions by formulating protective action information for the general public and food producers and processors. Demonstration of this criterion includes either pre-distributed public information material in the ingestion exposure pathway EPZ or the capability for rapid reproduction and distribution of appropriate reproduction-ready information and instructions to pre-determined individuals and businesses.

OROs must also demonstrate the capability to control, restrict, or prevent distribution of contaminated food by commercial sectors. Exercise play must include demonstration of communications and coordination among organizations to implement protective actions. Field play of implementation activities may be simulated. For example, communications and coordination with agencies responsible for enforcing food controls within the ingestion exposure pathway EPZ must be demonstrated, but actual communications with food producers and processors may be simulated.

All activities must be based on the ORO's plans/procedures and completed as they would be in an actual emergency, unless noted above or otherwise specified in the Extent-of-Play Agreement.

Sub-element 3.f – Implementation of Post-Plume Phase Relocation, Reentry, and Return Decisions

INTENT

This Sub-element is derived from NUREG0654/FEMA-REP-1, which requires that OROs have the capability to implement plans, procedures, and decisions for post-plume phase *relocation*, *reentry*, and *return*. Implementation of these decisions is essential for protecting the public from direct long-term exposure to deposited radioactive materials from a severe incident at a commercial NPP.

> ***Criterion 3.f.1: Decisions regarding controlled reentry, relocation, and return of individuals during the post-plume phase are coordinated with appropriate organizations and implemented. (NUREG0654/FEMA-REP-1, E.7; J.10.j; J.12; K.5.b; M.1, 3)***

ASSESSMENT/EXTENT OF PLAY

Assessment of this Demonstration Criterion may be accomplished during a biennial, or tabletop exercise, or by means of drills conducted at any time.

Relocation: OROs must demonstrate the capability to coordinate and implement decisions concerning relocation of individuals located in radiologically contaminated areas who were not previously evacuated. Such individuals must be relocated to an area(s) where radiological contamination will not expose the general public to doses that exceed the relocation PAGs. OROs must also demonstrate the capability to provide for short- or long-term relocation of evacuees who lived in an area(s) that has residual radiation levels above the (first-, second-, and 50-year) PAGs.

Areas of consideration must include the capability of OROs to communicate with other OROs regarding timing of actions, notification of the population of procedures for relocation, and notification of, and advice for, evacuated individuals who will be converted to relocation status in situations where they will not be able to return to their homes due to high levels of contamination. OROs must also demonstrate the capability to communicate instructions to the public regarding relocation decisions and intermediate-term housing for relocated persons.

Reentry: OROs must demonstrate the capability to control reentry and exit of individuals who are authorized by the ORO to temporarily reenter the restricted area during the post-plume (i.e., intermediate or late) phase to protect them from unnecessary radiation exposure. OROs must also demonstrate the capability to control exit of vehicles and other equipment to control the spread of contamination outside the restricted area(s). Individuals without specific radiological response missions, such as farmers for animal care, essential utility service personnel, or other members of the public who must reenter an evacuated area during the post-emergency phase must be limited to the lowest

radiological exposure commensurate with completing their missions. Monitoring and decontamination facilities will be established as appropriate.

Examples of control procedures are: (1) assignment of, or checking for, direct-reading and permanent record dosimetry for emergency workers; (2) questions regarding the individuals' objective(s), location(s) expected to be visited, and associated timeframes; (3) maps and plots of radiation exposure rates; (4) advice on areas to avoid; (5) procedures for exit, including monitoring of individuals, vehicles, and equipment; (6) decision criteria regarding contamination; (7) proper disposition of emergency worker dosimetry; and (8) maintenance of emergency worker radiation exposure records.

Return: OROs must demonstrate the capability to implement policies concerning return of members of the public to areas that were evacuated during the plume phase. OROs must demonstrate the capability to identify and prioritize services and facilities that require restoration within a few days, and to identify procedures and resources for their restoration. Examples of these services and facilities are medical and social services, utilities, roads, and schools.

Communication among OROs for relocation, reentry, and return may be simulated. All simulated or actual contacts must be documented. These discussions may be accomplished in a group setting.

OROs will use Federal resources as identified in the NRF Nuclear/Radiological Incident Annex, and other resources (e.g., compacts or nuclear insurers), as necessary, if available. Evaluation of this criterion will take into consideration the level of Federal and other resources participating in the exercise.

All activities must be based on the ORO's plans/procedures and completed as they would be in an actual emergency, unless noted above or otherwise specified in the Extent-of-Play Agreement.

Assessment Area 4: Field Measurements And Analyses

Sub-element 4.a – Plume Phase Field Measurements and Analyses

INTENT

This Sub-element is derived from NUREG0654/FEMA-REP-1, which requires that OROs have the capability to deploy FMTs with the equipment, methods, and expertise necessary to determine the location of airborne radiation and particulate deposition on the ground from an airborne plume. In addition, NUREG0654/FEMA-REP-1 indicates that OROs must have the capability to use FMTs within the plume exposure pathway EPZ to detect airborne radioiodine in the presence of noble gases and radioactive particulate material in the airborne plume. In an incident at an NPP, the possible release of radioactive material may pose a risk to the nearby population and environment. Although incident assessment methods are available to project the extent and magnitude of a release, these methods are subject to large uncertainties. During an incident, it is important to collect field radiological data to help characterize any radiological release. Adequate equipment and procedures are essential to such field measurement efforts.

Criterion 4.a.1: [RESERVED]

Criterion 4.a.2: *Field teams (2 or more) are managed to obtain sufficient information to help characterize the release and to control radiation exposure.* (NUREG0654/FEMA-REP-1, C.1; H.12; I.7, 8, 11; J.10.a)

ASSESSMENT/EXTENT OF PLAY

Assessment of this Demonstration Criterion may be accomplished during a biennial exercise. Other means may include drills that would fully demonstrate technical proficiency.

Responsible OROs must demonstrate the capability to brief FMTs on predicted plume location and direction, plume travel speed, and exposure control procedures before deployment. During an HAB incident, the Field Team management must keep the incident command informed of field monitoring teams' activities and location. Coordination with FMTs and field monitoring may be demonstrated as out-of-sequence demonstrations, as negotiated in the Extent-of-Play Agreement.

Field measurements are needed to help characterize the release and support the adequacy of implemented protective actions, or to be a factor in modifying protective actions. Teams must be directed to take measurements at such locations and times as necessary to provide sufficient information to characterize the plume and its impacts.

If the responsibility for obtaining peak measurements in the plume has been accepted by licensee field monitoring teams, with concurrence from OROs, there is no requirement for these measurements to be repeated by ORO monitoring teams. If the licensee FMTs do not obtain peak measurements in the plume, it is the ORO's decision as to whether peak measurements are necessary to sufficiently characterize the plume. The sharing and coordination of plume measurement information among all FMTs (licensee, Federal, and ORO) is essential.

OROs will use Federal resources as identified in the NRF Nuclear/Radiological Incident Annex and other resources (e.g., compacts or the licensee), as necessary. Evaluation of this criterion will take into consideration the level of Federal and other resources participating in the exercise.

All activities must be based on the ORO's plans/procedures and completed as they would be in an actual emergency, unless noted above or otherwise specified in the Extent-of-Play Agreement.

Criterion 4.a.3: *Ambient radiation measurements are made and recorded at appropriate locations, and radioiodine and particulate samples are collected. Teams will move to an appropriate low background location to determine whether any significant (as specified in the plan and/or procedures) amount of radioactivity has been collected on the sampling media.* (NUREG0654/FEMA-REP-1, C.1; H.12: I.8, 9; J.10.a)

ASSESSMENT/EXTENT OF PLAY

Assessment of this Demonstration Criterion may be accomplished during a biennial exercise. Other means may include drills that would fully demonstrate technical proficiency.

Two or more FMTs must demonstrate the capability to make and report measurements of ambient radiation to the field team coordinator, dose assessment team, or other appropriate authority. FMTs must also demonstrate the capability to obtain an air sample for measurement of airborne radioiodine and particulates, and to provide the appropriate authority with field data pertaining to measurement. If samples have radioactivity significantly above background, the authority must consider the

need for expedited laboratory analyses of these samples. Coordination concerning transfer of samples, including a chain-of-custody form(s), to a radiological laboratory(ies) must be demonstrated.

OROs must share data in a timely manner with all other appropriate OROs. All methodology, including contamination control, instrumentation, preparation of samples, and a chain-of-custody form(s) for transfer to a laboratory(ies), will be in accordance with the ORO's plans/procedures.

OROs will use Federal resources as identified in the NRF Nuclear/Radiological Incident Annex and other resources (e.g., compacts or the licensee), as needed. Evaluation of this criterion will take into consideration the level of Federal and other resources participating in the exercise.

All activities must be based on the ORO's plans/procedures and completed as they would be in an actual emergency, unless noted above or otherwise specified in the Extent-of-Play Agreement.

Sub-element 4.b – Post-Plume Phase Field Measurements and Sampling

INTENT

This Sub-element is derived from NUREG0654/FEMA-REP-1, which requires that OROs have the capability to assess the actual or potential magnitude and locations of radiological hazards to determine the ingestion exposure pathway EPZ and to support relocation, reentry, and return decisions. This Sub-element focuses on collecting environmental samples for laboratory analyses that are essential for decisions on protecting the public from contaminated food and water and direct radiation from deposited materials.

> ***Criterion 4.b.1: The field teams (2 or more) demonstrate the capability to make appropriate measurements and to collect appropriate samples (e.g., food crops, milk, water, vegetation, and soil) to support adequate assessments and protective action decision making. (NUREG0654/FEMA-REP-1, C.1; I.8; J.11)***

ASSESSMENT/EXTENT OF PLAY

Assessment of this Demonstration Criterion may be accomplished during a biennial or tabletop exercise. Other means may include drills, seminars or training activities that would fully demonstrate technical proficiency.

The ORO's FMTs must demonstrate the capability to take measurements and samples, at such times and locations as directed, to enable an adequate assessment of the ingestion pathway and to support reentry, relocation, and return decisions. When resources are available, use of aerial surveys and in-situ gamma measurement is appropriate. All methodology, including contamination control, instrumentation, preparation of samples, and chain-of-custody form(s) for transfer to a laboratory(ies), will be in accordance with the ORO's plans/procedures.

The FMTs and/or other sampling personnel must secure ingestion pathway samples from agricultural products and water. Samples in support of relocation and return must be secured from soil, vegetation, and other surfaces in areas that received radioactive ground deposition.

OROs will use Federal resources as identified in the NRF Nuclear/Radiological Incident Annex and other resources (e.g., compacts, the licensee, or nuclear insurers), as needed. Evaluation of this criterion will take into consideration the level of Federal and other resources participating in the exercise.

All activities must be based on the ORO's plans/procedures and completed as they would be in an actual emergency, unless noted above or otherwise specified in the Extent-of-Play Agreement.

Sub-element 4.c – Laboratory Operations

INTENT

This Sub-element is derived from NUREG0654/FEMA-REP-1, which requires that OROs have the capability to perform laboratory analyses of radioactivity in air, liquid, and environmental samples to support protective action decision making.

> ***Criterion 4.c.1: The laboratory is capable of performing required radiological analyses to support protective action decisions. (NUREG0654/FEMA-REP-1, C.1, 3; J.11)***

ASSESSMENT/EXTENT OF PLAY

Assessment of this Demonstration Criterion may be accomplished during a biennial, tabletop exercise, or an actual event. Other means may include drills, seminars or training activities that would fully demonstrate technical proficiency.

The laboratory staff must demonstrate the capability to follow appropriate procedures for receiving samples, including logging information, preventing contamination of the laboratory(ies), preventing buildup of background radiation due to stored samples, preventing cross contamination of samples, preserving samples that may spoil (e.g., milk), and keeping track of sample identity. In addition, the laboratory staff must demonstrate the capability to prepare samples for conducting measurements.

The laboratory(ies) must be appropriately equipped to provide, upon request, timely analyses of media of sufficient quality and sensitivity to support assessments and decisions anticipated in the ORO's plans/procedures. The laboratory instrument calibrations must be traceable to standards provided by the National Institute of Standards and Technology. Laboratory methods used to analyze typical radionuclides released in a reactor incident must be as described in the plans/procedures. New or revised methods may be used to analyze atypical radionuclide releases (e.g., transuranics or as a result of a terrorist incident) or if warranted by incident circumstances. Analysis may require resources beyond those of the ORO.

The laboratory staff must be qualified in radioanalytical techniques and contamination control procedures.

OROs will use Federal resources as identified in the NRF Nuclear/Radiological Incident Annex and other resources (e.g., compacts, the licensee, or nuclear insurers), as needed. Evaluation of this criterion will take into consideration the level of Federal and other resources participating in the exercise.

All activities must be based on the ORO's plans/procedures and completed as they would be in an actual emergency, unless noted above or otherwise specified in the Extent-of-Play Agreement.

Assessment Area 5: Emergency Notification And Public Information

Sub-element 5.a – Activation of the Prompt Alert and Notification System

INTENT

This Sub-element is derived from NUREG0654/FEMA-REP-1, which requires that OROs have the capability to provide prompt instructions to the public within the plume exposure pathway EPZ. Specific provisions addressed in this Sub-element are further discussed in Section V, Part A of this Manual, Alert and Notification Systems.

Exhibit III-4: Evaluation Standards for Alert and Notification Systems

Demonstration Criterion:	In a Timely Manner	Within 45 minutes	Within a Reasonable Time
Primary Alert and Notification			
5.a.1: …covering essentially 100% of the 10-mile EPZ	X		
5.a.4: …for FEMA-approved exception areas		X	
Backup Alert and Notification for All Incidents			
5.a.3: …covering the 10-mile EPZ			X

Criterion 5.a.1: Activities associated with primary alerting and notification of the public are completed in a timely manner following the initial decision by authorized offsite emergency officials to notify the public of an emergency situation. The initial instructional message to the public must include as a minimum the elements required by current REP guidance. (NUREG0654/FEMA-REP-1, E.5, 6, 7)

ASSESSMENT/EXTENT OF PLAY

Assessment of this Demonstration Criterion may be accomplished during a biennial exercise, drills, or operational testing of equipment that would fully demonstrate capability.

Responsible OROs must demonstrate the capability to sequentially provide an alert signal followed by an initial instructional message to populated areas (permanent resident and transient) throughout the 10-mile plume EPZ. Following the decision to activate the alert and notification system, OROs must complete system activation for primary alert/notification and disseminate the information/instructions in a timely manner. For exercise purposes, timely is defined as "with a sense of urgency and without undue delay." If message dissemination is identified as not having been accomplished in a timely manner, the evaluator(s) will document a specific delay or cause as to why a message was not considered timely.

Procedures to broadcast the message must be fully demonstrated as they would in an actual emergency up to the point of transmission. Broadcast of the message(s) or test message(s) is not required. The procedures must be demonstrated up to the point of actual activation. The alert signal activation should be simulated, not performed. Evaluations of EAS broadcast stations may also be accomplished through SAVs.

The capability of the primary notification system to broadcast an instructional message on a 24-hour basis must be verified during an interview with appropriate personnel from the primary notification system, including verification of provisions for backup power or an alternate station.

The initial message must include at a minimum the following elements:

- Identification of the ORO responsible and the official with authority for providing the alert signal and instructional message;
- Identification of the commercial NPP and a statement that an emergency exists there;
- Reference to REP-specific emergency information (e.g., brochures, calendars, and/or information in telephone books) for use by the general public during an emergency; and
- A closing statement asking that the affected and potentially affected population stay tuned for additional information, or that the population tune to another station for additional information.

If route alerting is demonstrated as a primary method of alert and notification, it must be done in accordance with the ORO's plans/procedures and the Extent-of-Play Agreement. OROs must demonstrate the capability to accomplish the primary route alerting in a timely manner (not subject to specific time requirements). At least one

route needs to be demonstrated and evaluated. The selected route(s) must vary from exercise to exercise. However, the most difficult route(s) must be demonstrated no less than once every 8 years. All alert and notification activities along the route(s) must be simulated (that is, the message that would actually be used is read for the evaluator, but not actually broadcast) as negotiated in the extent of play. Actual testing of the mobile public address system will be conducted at an agreed-upon location.

OROs may demonstrate any means of primary alert and notification included in their plans/procedures as negotiated in the Extent-of-Play Agreement.

All activities must be based on the ORO's plans/procedures and completed as they would be in an actual emergency, unless noted above or otherwise specified in the Extent-of-Play Agreement.

Criterion 5.a.2: [RESERVED]

Criterion 5.a.3: Backup alert and notification of the public is completed within a reasonable time following the detection by the ORO of a failure of the primary alert and notification system. (NUREG0654/FEMA-REP-1, E.6, Appendix 3.B.2.c)

ASSESSMENT/EXTENT OF PLAY

Assessment of this Demonstration Criterion may be accomplished during a biennial exercise, drills, or operational testing of equipment that would fully demonstrate capability.

If the exercise scenario calls for failure of any portion of the primary system(s) or if any portion of the primary system(s) actually fails to function during the exercise, OROs must demonstrate backup means of alert and notification. Backup means of alert and notification will differ from facility to facility.

Backup alert and notification procedures that would be implemented in multiple stages must be structured such that the population closest to the plant (e.g., within 2 miles) is alerted and notified first. The populations farther away and downwind of any potential radiological release would be covered sequentially (e.g., 2 to 5 miles, followed by downwind 5 to 10 miles, and finally the remaining population as directed by authorities). Topography, population density, existing ORO resources, and timing will be considered in judging the acceptability of backup means of alert and notification.

Although circumstances may not allow this for all situations, FEMA and the NRC recommend that OROs and operators attempt to establish backup means that will reach those in the plume exposure EPZ within a reasonable time of failure of the primary alert and notification system, with a recommended goal of 45 minutes. The backup alert message must, at a minimum, include: (1) a statement that an emergency exists at the plant; and (2) instructions regarding where to obtain additional information.

When backup route alerting is demonstrated, **only one route needs to be selected and demonstrated**. All alert and notification activities along the route(s) must be simulated (that is, the message that would actually be used is read for the evaluator, but not actually broadcast), as negotiated in the extent of play. Actual testing of the mobile public address system will be conducted at an agreed-upon location.

OROs may demonstrate any means of backup alert and notification included in their plans/procedures as negotiated in the Extent-of-Play Agreement.

All activities must be based on the ORO's plans/procedures and completed as they would be in an actual emergency, unless noted above or otherwise specified in the Extent-of-Play Agreement.

Criterion 5.a.4: Activities associated with FEMA-approved exception areas (where applicable) are completed within 45 minutes following the initial decision by authorized offsite emergency officials to notify the public of an emergency situation. (NUREG-0654/FEMA-REP-1, E.6; Appendix 3.B.2.c)

ASSESSMENT/EXTENT OF PLAY

Assessment of this Demonstration Criterion may be accomplished during a biennial exercise, drills, or operational testing of equipment that would fully demonstrate capability.

OROs with FEMA-approved exception areas (identified in the approved *Alert and Notification System Design Report*), 5 to 10 miles from the NPP, must demonstrate the capability to accomplish primary alerting and notification of the exception area(s). FEMA and the NRC recommend that OROs and operators establish means that will reach those in approved exception areas within 45 minutes once the initial decision is made by authorized offsite emergency officials to notify the public of an incident. The exception area alert message must, at a minimum, include (1) a statement that an emergency exists at the plant and (2) instructions regarding where to obtain additional information.

For exception area alerting, at least one route must be demonstrated and evaluated. The selected route(s) must vary from exercise to exercise. However, the most difficult route(s) must be demonstrated no less than once every 8 years. All alert and notification activities along the route(s) must be simulated (that is, the message that would actually be used is read for the evaluator, but not actually broadcasted) as negotiated in the extent of play. Actual testing of the mobile public address system will be conducted at an agreed-upon location. For exception areas alerted by air/water craft, actual routes will be negotiated in the extent of play, but must be demonstrated no less than once every 8 years.

All activities must be based on the ORO's plans/procedures and completed as they would be in an actual emergency, unless noted above or otherwise specified in the Extent-of-Play Agreement.

Sub-element 5.b – Subsequent Emergency Information and Instructions for the Public and the Media

INTENT

This Sub-element is derived from NUREG0654/FEMA-REP-1, which requires that OROs have the capability to disseminate appropriate emergency information and instructions, including any recommended protective actions, to the public. In addition, NUREG0654/FEMA-REP-1 requires OROs to ensure that the capability exists for providing information to the media. This includes the availability of a physical location for use by the media during an emergency. NUREG0654/FEMA-REP-1 also provides that a system must be available for dealing with rumors. This system will hereafter be known as the "public inquiry hotline."

> ***Criterion 5.b.1: OROs provide accurate subsequent emergency information and instructions to the public and the news media in a timely manner. (NUREG0654/FEMA-REP-1, E.5, 7; G.3.a, G.4.a, c)***

ASSESSMENT/EXTENT OF PLAY

Assessment of this Demonstration Criterion may be accomplished during a biennial exercise, or drills.

The responsible ORO personnel/representatives must demonstrate actions to provide emergency information and instructions to the public and media in a timely manner following the initial alert and notification (not subject to specific time requirements). For exercise purposes, timely is defined as "with a sense of urgency and without undue delay." If message dissemination is identified as not having been accomplished in a timely manner, the evaluator(s) will document a specific delay or cause as to why a message was not considered timely.

Message elements: The ORO must ensure that emergency information and instructions are consistent with PADs made by appropriate officials. The emergency information must contain all necessary and applicable instructions (e.g., evacuation instructions, evacuation routes, reception center locations, what to take when evacuating, shelter-in-place instructions, information concerning protective actions for schools and persons with disabilities and access/functional needs, and public inquiry hotline telephone number) to assist the public in carrying out the PADs provided. The ORO must also be prepared to disclose and explain the ECL of the incident. At a minimum, this information must be included in media briefings and/or media releases. OROs must demonstrate the capability to use language that is clear and understandable to the public within both the plume and ingestion exposure pathway EPZs. This includes demonstration of the capability to use familiar landmarks and boundaries to describe protective action areas.

The emergency information must be all-inclusive by including the four items specified under exercise Demonstration Criterion 5.a.1 and previously identified protective action areas that are still valid, as well as new areas. The OROs must demonstrate the capability to ensure that emergency information that is no longer valid is rescinded and not repeated by broadcast media. In addition, the OROs must demonstrate the capability to ensure that current emergency information is repeated at pre-established intervals in accordance with the plans/procedures. OROs must demonstrate the capability to develop emergency information in a non-English language when required by the plans/procedures.

If ingestion pathway measures are exercised, OROs must demonstrate that a system exists for rapid dissemination of ingestion pathway information to predetermined individuals and businesses in accordance with the ORO's plans/procedures.

Media information: OROs must demonstrate the capability to provide timely, accurate, concise, and coordinated information to the news media for subsequent dissemination to the public. This would include demonstration of the capability to conduct timely and pertinent media briefings and distribute media releases as the incident warrants. The OROs must demonstrate the capability to respond appropriately to inquiries from the news media. All information presented in media briefings and releases must be consistent with PADs and other emergency information provided to the public. Copies of pertinent emergency information (e.g., EAS messages and media releases) and media information kits must be available for dissemination to the media.

Public inquiry: OROs must demonstrate that an effective system is in place for dealing with calls received via the public inquiry hotline. Hotline staff must demonstrate the capability to provide or obtain accurate information for callers or refer them to an appropriate information source. Information from the hotline staff, including information that corrects false or inaccurate information when trends are noted, must be included, as appropriate, in emergency information provided to the public, media briefings, and/or media releases.

HAB considerations: The dissemination of information dealing with specific aspects of NPP security capabilities, actual or perceived adversarial (terrorist) force or threat, and tactical law enforcement response must be coordinated/communicated with appropriate security authorities, e.g., law enforcement and NPP security agencies, in accordance with ORO plans/procedures.

All activities must be based on the ORO's plans/procedures and completed as they would be in an actual emergency, unless noted above or otherwise specified in the Extent-of-Play Agreement.

Assessment Area 6: Support Operations/Facilities

Sub-element 6.a – Monitoring, Decontamination, and Registration of Evacuees

INTENT

This Sub-element is derived from NUREG0654/FEMA-REP-1, which requires that OROs have the capability to implement radiological monitoring and decontamination of evacuees, while minimizing contamination of the facility. OROs must also have the capability to identify and register evacuees at reception centers.

> ***Criterion 6.a.1: The reception center facility has appropriate space, adequate resources, and trained personnel to provide monitoring, decontamination, and registration of evacuees. (NUREG0654/FEMA-REP-1, A.3; C.4; J.10.h; J.12)***

ASSESSMENT/EXTENT OF PLAY

Assessment of this Demonstration Criterion may be accomplished during a biennial exercise, an actual event, drills, or SAV.

Radiological monitoring, decontamination, and registration facilities for evacuees must be set up and demonstrated as they would be in an actual emergency or as indicated in the Extent-of-Play Agreement. OROs conducting this demonstration must have one-third of the resources (e.g., monitoring teams/instrumentation/portal monitors) available at the facility(ies) as necessary to monitor 20 percent of the population within a 12-hour period. This would include adequate space for evacuees' vehicles. Availability of resources can be demonstrated with valid documentation (e.g., MOU/LOA, etc.) reflecting how necessary equipment would be procured for the location. Plans/procedures must indicate provisions for service animals.

Before using monitoring instrument(s), the monitor(s) must demonstrate the process of checking the instrument(s) for proper operation. Staff responsible for the radiological monitoring of evacuees must demonstrate the capability to attain and sustain, within about 12 hours, a monitoring productivity rate per hour needed to monitor the 20 percent EPZ population planning base. The monitoring productivity rate per hour is the number of evacuees that can be monitored, per hour, by the total complement of monitors using an appropriate procedure. For demonstration of monitoring, decontamination, and registration capabilities, a minimum of six evacuees must be monitored per station using equipment and procedures specified in the plans/procedures. The monitoring sequences for the first six simulated evacuees per monitoring team will be timed by the evaluators to determine whether the 12-hour requirement can be met.

OROs must demonstrate the capability to register evacuees upon completion of the monitoring and decontamination activities. The activities for recording radiological monitoring and, if necessary, decontamination must include establishing a registration record consisting of the evacuee's name, address, results of monitoring, and time of decontamination (if any), or as otherwise designated in the plan and/or procedures. Audio recorders, camcorders, or written records are all acceptable means for registration.

Monitoring activities shall not be simulated. Monitoring personnel must explain use of trigger/action levels for determining the need for decontamination. They must also explain the procedures for referring any evacuees who cannot be adequately decontaminated for assessment and follow-up in accordance with the ORO's plans/procedures. All activities must be based on the ORO's plans/procedures and completed as they would be in an actual emergency, unless noted above or otherwise specified in the Extent-of-Play Agreement.

Decontamination of evacuees may be simulated and conducted by interview. Provisions for separate showering and same-sex decontamination must be demonstrated or explained. The staff must demonstrate provisions for limiting the spread of contamination. Provisions could include floor coverings, signs, and appropriate means (e.g., partitions, roped-off areas) to separate uncontaminated from potentially contaminated areas. Provisions must also exist to separate contaminated and uncontaminated evacuees, provide changes of clothing for those with contaminated clothing; and store contaminated clothing and personal belongings to prevent further contamination of evacuees or facilities. In addition, for any evacuee found to be contaminated, procedures must be discussed concerning handling of potential contamination of vehicles and personal belongings. Waste water from decontamination operations does not need to be collected.

Individuals who have completed monitoring (and decontamination, if needed) must have means (e.g., hand stamp, sticker, bracelet, form, etc.) indicating that they, and their service animals and vehicles, where applicable, have been monitored, cleared, and found to have no

contamination or contamination below the trigger/action level or have been placed in a secure area until they can be monitored and decontaminated, if necessary.

In accordance with plans/procedures, individuals found to be clean after monitoring do not need to have their vehicle monitored. These individuals do not require confirmation that their vehicle is free from contamination prior to entering the congregate care areas.

However, those individuals who are found to be contaminated and are then decontaminated will have their vehicles held in a secure area or monitored and decontaminated (if applicable) and do require confirmation that their vehicle is being held in a secure area or free from contamination prior to entering the congregate care areas.

Sub-element 6.b – Monitoring and Decontamination of Emergency Workers and their Equipment and Vehicles

INTENT

This Sub-element is derived from NUREG0654/FEMA-REP-1, which requires that OROs have the capability to implement radiological monitoring and decontamination of emergency workers and their equipment, inclusive of vehicles.

> ***Criterion 6.b.1: The facility/ORO has adequate procedures and resources to accomplish monitoring and decontamination of emergency workers and their equipment and vehicles. (NUREG0654/FEMA-REP-1, K.5.a, b)***

ASSESSMENT/EXTENT OF PLAY

Assessment of this Demonstration Criterion may be accomplished during a biennial exercise, drills, an actual event, or SAV.

The monitoring staff must demonstrate the capability to monitor emergency worker personnel and their equipment and vehicles for contamination in accordance with the ORO's plans/procedures.

Specific attention must be given to equipment, including any vehicles that were in contact with contamination. The monitoring staff must demonstrate the capability to make decisions on the need for decontamination of personnel, equipment, and vehicles based on trigger/action levels and procedures stated in the ORO plans/procedures. Monitoring of emergency workers does not have to meet the 12-hour requirement. However, appropriate monitoring procedures must be demonstrated for a minimum of two emergency workers and their equipment and vehicles. Before using monitoring instrument(s), the monitor(s) must demonstrate the process of checking the instrument(s) for proper operation.

The area to be used for monitoring and decontamination must be set up as it would be in an actual emergency, with all route markings, instrumentation, record keeping, and contamination control measures in place. Monitoring procedures must be demonstrated for a minimum of one vehicle. It is generally not necessary to monitor the entire surface of vehicles. However, the capability to monitor areas such as radiator grills, bumpers, wheel wells, tires, and door handles must be demonstrated. Interior surfaces of vehicles that were in contact with contaminated individuals must also be checked.

Decontamination of emergency workers may be simulated and conducted via interview. Provisions for separate showering and same-sex decontamination must be demonstrated or explained. The staff must demonstrate provisions for limiting the spread of contamination. Provisions could include floor coverings, signs, and appropriate means (e.g., partitions, roped-off areas) to separate uncontaminated from potentially contaminated areas. Provisions must also exist to separate contaminated and uncontaminated individuals where applicable; provide changes of clothing for those with contaminated clothing; and store contaminated clothing and personal belongings to prevent further contamination of emergency workers or facilities.

OROs must demonstrate the capability to register emergency workers upon completion of the monitoring and decontamination activities. The activities for recording radiological monitoring and, if necessary, decontamination must include establishing a registration record consisting of the emergency worker's name, address, results of monitoring, and time of decontamination (if any), or as otherwise designated in the plan and/or procedures. Audio recorders, camcorders, or written records are all acceptable means for registration.

Monitoring activities shall not be simulated. Monitoring personnel must explain use of trigger/action levels for determining the need for decontamination. They must also explain the procedures for referring any emergency workers who cannot be adequately decontaminated for assessment and follow-up in accordance with the ORO's plans/procedures.

Decontamination capabilities and provisions for vehicles and equipment that cannot be successfully decontaminated may be simulated and conducted by interview. Waste water from decontamination operations does not need to be collected.

All activities must be based on the ORO's plans/procedures and completed as they would be in an actual emergency, unless noted above or otherwise specified in the Extent-of-Play Agreement.

Sub-element 6.c – Temporary Care of Evacuees

INTENT

This Sub-element is derived from NUREG0654/FEMA-REP-1, which requires OROs to have the capability to establish relocation centers in host/support jurisdictions. The American Red Cross normally provides congregate care in support of OROs under existing letters of agreement.

> ***Criterion 6.c.1: Managers of congregate care facilities demonstrate that the centers have resources to provide services and accommodations consistent with American Red Cross planning guidelines. Managers demonstrate the procedures to assure that evacuees have been monitored for contamination and have been decontaminated as appropriate prior to entering congregate care facilities. (NUREG0654/FEMA-REP-1, J.10.h, J.12)***

ASSESSMENT/EXTENT OF PLAY

Assessment of this Demonstration Criterion may be accomplished during a biennial exercise, drills, an actual event, or SAV.

The evaluator must conduct a walk-through of the center to determine, through observation and inquiries, that the services and accommodations are consistent with applicable guidance.

For planning purposes, OROs must plan for a sufficient number of congregate care centers in host/support jurisdictions based on their all-hazard sheltering experience and what is historically relevant for that particular area. In this simulation, it is not necessary to set up operations as they would be in an actual emergency. Alternatively, capabilities may be demonstrated by setting up stations for various services and providing those services to simulated evacuees. Given the substantial differences between demonstration and simulation of this criterion, exercise demonstration expectations must be clearly specified in Extent-of-Play Agreements.

Congregate care staff must also demonstrate the capability to ensure that evacuees, service animals, and vehicles have been monitored for contamination, decontaminated as appropriate, and registered before entering the facility.

Individuals arriving at congregate care facilities must have means (e.g., hand stamp, sticker, bracelet, form, etc.) indicating that they, and their service animals and vehicles, where applicable, have been placed in a secured area or monitored, cleared, and found to have no contamination or contamination below the trigger/action level.

In accordance with plans/procedures, individuals found to be clean after monitoring do not need to have their vehicle monitored. These individuals do not need confirmation that their vehicle is free from contamination prior to entering the congregate care areas.

However, those individuals who are found to be contaminated and are then decontaminated will have their vehicles held in a secure area until they can be monitored and decontaminated (if applicable) and do need confirmation that their vehicle is being held in a secure area or free from contamination prior to entering the congregate care areas. This capability may be determined through an interview process.

If operations at the center are demonstrated, material that would be difficult or expensive to transport (e.g., cots, blankets, sundries, and large-scale food supplies) need not be physically available at the facility(ies). However, availability of such items must be verified by providing the evaluator a list of sources with locations and estimates of quantities.

All activities must be based on the ORO's plans/procedures and completed as they would be in an actual emergency, unless noted above or otherwise specified in the Extent-of-Play Agreement.

Sub-element 6.d – Transportation and Treatment of Contaminated Injured Individuals

INTENT

This Sub-element is derived from NUREG0654/FEMA-REP-1, which requires that OROs have the capability to transport contaminated injured individuals to medical facilities with the capability to provide medical services.

Criterion 6.d.1: The facility/ORO has the appropriate space, adequate resources, and trained personnel to provide transport, monitoring, decontamination, and medical services to contaminated injured individuals. (NUREG0654/FEMA-REP-1, F.2; H.10; K.5.a, b; L.1, 4)

ASSESSMENT/EXTENT OF PLAY

Assessment of this Demonstration Criterion may be accomplished during a biennial exercise, an actual event, or drills. FEMA has determined that these capabilities have been enhanced and consistently demonstrated as adequate; therefore, offsite medical services drills need only be evaluated biennially. FEMA will, at the request of the involved ORO, continue to evaluate the drills on an annual basis. If more than two medical facilities and transportation providers are designated as primary or backup, they are also evaluated biennially.

Monitoring, decontamination, and contamination control efforts must not delay urgent medical care for the victim.

OROs must demonstrate the capability to transport contaminated injured individuals to medical facilities.

An ambulance must be used for response to the victim. However, to avoid taking an ambulance out of service for an extended time, OROs may use any vehicle (e.g., car, truck, or van) to transport the victim to the medical facility. It is allowable for an ambulance to demonstrate up to the point of departure for the medical facility and then have a non-specialized vehicle transport the "victim(s)" to the medical facility. This option is used in areas where removing an ambulance from service to drive a great distance (over an hour) for a drill would not be in the best interests of the community.

Normal communications between the ambulance/dispatcher and the receiving medical facility must be demonstrated. If a substitute vehicle is used for transport to the medical facility, this communication must occur before releasing the ambulance from the drill. This communication would include reporting radiation monitoring results, if available. In addition, the ambulance crew must demonstrate, by interview, knowledge of where the ambulance and crew would be monitored and decontaminated, if required, or whom to contact for such information.

Monitoring of the victim may be performed before transport or en route, or may be deferred to the medical facility. Contaminated injured individuals transported to medical facilities are monitored as soon as possible to assure that everyone (ambulance and medical facility) is aware of the medical and radiological status of the individual(s). However, if an ambulance defers monitoring to the medical facility, then the ambulance crew presumes that the patient(s) is contaminated and demonstrate appropriate contamination controls until the patient(s) is monitored. Before using monitoring instruments, the monitor(s) must demonstrate the process of checking the instrument(s) for proper operation. All monitoring activities must be completed as they would be in an actual emergency. Appropriate contamination control measures must be demonstrated before and during transport and at the receiving medical facility.

The medical facility must demonstrate the capability to activate and set up a radiological emergency area for treatment. Medical facilities are expected to have at least one trained physician and one trained nurse to perform and supervise treatment of contaminated injured individuals. Equipment and supplies must be available for treatment of contaminated injured individuals.

The medical facility must demonstrate the capability to make decisions on the need for decontamination of the individual, follow appropriate decontamination procedures, and maintain records of all survey measurements and samples taken. All procedures for collection and analysis of samples and decontamination of the individual must be demonstrated or described to the evaluator. Waste water from decontamination operations must be handled according to facility plans/procedures.

All activities must be based on the ORO's plans/procedures and completed as they would be in an actual emergency, unless noted above or otherwise specified in the Extent-of-Play Agreement.

Part IV: FEMA REP PROGRAM ADMINISTRATION

A. INTRODUCTION

The intent of this part of the REP Program Manual is to provide general guidance on the FEMA REP Program administrative policies and procedures. Examples provided in this Part are meant to show how a particular task may be accomplished, but are not intended to mandate a specific way of accomplishing tasks.

Following this introduction, the contents of this Part are:

B. Regulatory Summary;

C. Non-participating State, Tribal, and local governments (NUREG-0654/FEMA-REP-1, Supplement 1);

D. Early Site Permit Applications (NUREG-0654/FEMA-REP-1, Supplement 2);

E. Protective Action Strategies (NUREG-0654/FEMA-REP-1, Supplement 3);

F. Exercise Methodology, More Challenging Drills and Exercises, and Backup Alert and Notification Requirements (NUREG-0654/FEMA-REP-1, Supplement 4);

G. Demonstration Considerations for No/Minimal Release Scenarios;

H. Integration of REP Demonstration Criteria and Core Capabilities;

I. Submitting Best Practices on the FEMA Website;

J. Approval Process for Alternative Approaches

K. Emergency Planning Zone Boundary Changes;

L. Credentialing Framework;

M. Use of State, Local, and Tribal Personnel as REP Exercise Evaluators;

N. Tribal Policies and Procedures;

O. Staff Assistance Visits (SAVs);

P. Evacuation Time Estimates;

Q. Potassium Iodide for the Public;

R. Conducting Plan Reviews;

S. Conducting Scenario Reviews;

T. Annual Letter of Certification (ALC);

U. Public Information Guide and Process;

V. Conducting a Disaster Initiated Review; and

W. List of Commercial Nuclear Power Plants.

B. REGULATORY SUMMARY

This section summarizes the FEMA regulations pertinent to the REP Program (44 CFR Parts 350-354). This section is intended for background only. FEMA staff and other persons interested in emergency preparedness for NPPs are urged to consult the regulations themselves for the authoritative answer to any questions concerning FEMA REP policy and procedure. In all cases the regulations shall take precedence over any statements or representations made in this section.

1. 44 CFR Part 350 – Review and Approval of State and Local Radiological Emergency Plans and Preparedness

44 CFR Part 350 sets forth the basis for FEMA's REP Program. This part covers:

- The procedural process by which State and Tribal governments submit plans/procedures to protect the health and safety of the public to FEMA for formal approval;
- Substantive requirements for emergency planning and exercises;
- FEMA's process for evaluating and approving emergency preparedness; and
- Requirements and procedures for involving the public.

This discussion is divided into four sections: Initial Approval, Continuation of Approval, Withdrawal of Approval, and Appeals.

a. Initial Approval of Plans/Procedures and Preparedness

The approval of plans/procedures under 44 CFR Part 350 is site-specific. Each State and/or Tribal Nation, together with the affected local jurisdictions within the site's EPZ, applies for approval under 44 CFR § 350.7(c).

(1) Overview of Requirements and Procedure

The following requirements must be fulfilled for FEMA to formally approve ORO radiological emergency preparedness for a commercial NPP:

- Acceptable ORO emergency response plans/procedures must be in place for the plume and ingestion pathway EPZs. Planning for protective measures within the ingestion pathway is a State responsibility, as stated in NUREG-0654/FEMA-REP-1.
- At least one joint, Federally-evaluated exercise must be held by the affected OROs.
- A public meeting must be held near the power plant to receive comments on the adequacy of the plans/procedures and whether the OROs are capable of implementing them.

After the State and/or Tribal nation has applied to FEMA for approval under 44 CFR Part 350 the responsible FEMA Regional Office, assisted by members of the RAC, makes the initial determination as to whether the requirements have been fulfilled. The FEMA Regional Office then furnishes the application, together with supporting materials and an evaluation of preparedness, to FEMA Headquarters. FEMA Headquarters staff, with assistance from the FRPCC, reviews the application and materials. (The composition and role of the FRPCC and RAC are described further in 44 CFR § 351.) The Director of FEMA's Technological Hazards Division (hereafter, THD Director) within the FEMA NPD,[96] issues a decision on the application and forwards it to the Deputy Administrator for National Preparedness and the FEMA Administrator. The Administrator notifies the Governor(s) of the State(s) making application, the NRC, and the appropriate FEMA Regional Administrator. The Administrator also publishes a notice on the final decision in the *Federal Register*.

(2) Application Procedure

The application procedure is described in 44 CFR § 350.7. The application is submitted by the Governor (or Governor's designee) to the appropriate FEMA Regional Administrator. The application must include a copy of the State plans/procedures (including coverage of response in the ingestion exposure pathway EPZ) and local radiological emergency plans/procedures for the site's plume exposure pathway EPZ [350 CFR § 350.7(a)]. The State must also certify that the plans/procedures are "adequate to protect the public

[96] The term Associate Director as used in the regulation originally referred to the Associate Director, State and Local Programs and Support [44 CFR Part 350.2(c)].

health and safety of its citizens living within the emergency planning zones…by providing reasonable assurance that State and local governments can and intend to effect appropriate protective measures offsite in a radiological emergency" [44 CFR § 350.7(d)].

(3) FEMA Regional Review

RECEIPT OF APPLICATION AND REVIEW OF PLANS

Upon receipt of the application from a State, the FEMA Regional Administrator:

- Acknowledges receipt of the application, in writing, within 10 days [44 CFR § 350.8(a)].
- Publishes a notice in the *Federal Register* within 30 days. The notice must state that the application has been received and that copies of the application are available to the public at the FEMA Regional Office for review in accordance with 44 CFR 5.26 [44 CFR § 350.8(b)]. (44 CFR 5.26, entitled "Rules for public inspection and copying," specifies that documents will be available for public inspection during normal business hours and that copies will be furnished according to a standard fee schedule.)
- Furnishes copies of the plans/procedures to the RAC for evaluation and comment [44 CFR § 350.8(c)]. See Exhibit IV-1 for RAC agency plan review responsibilities by NUREG-0654/FEMA-REP-1 Evaluation Criterion.
- Conducts a detailed review of the plans/procedures and evaluates the ability of the OROs to implement them, using comments from the RAC members as part of the evaluation process [44 CFR § 350.8(d)]. (See Part IV, Conducting Plan Reviews.)

Exhibit IV-1: Plan Review Responsibilities for RAC Agencies

NUREG-0654/FEMA-REP-1	FEMA	NRC	DOE	EPA	FDA	HHS	DOT	USDA	DOI	DOC
A.1.a	X								X	X
A.1.b	X								X	X
A.1.c	X								X	X
A.1.d	X		X						X	X
A.1.e	X								X	X
A.2.a	X		X	X	X	X	X	X	X	X
A.2.b									X	X
A.3	X		X	X				X	X	X
A.4			X						X	
B (All)		Onsite								
C.1.a		X	X							
C.1.b			X							
C.1.c			X	X						
C.2.a	X	X			X					
C.3		X	X	X	X					
C.4	X	X	X	X	X		X		X	X
D.3	X	X								
D.4	X									
E.1	X	X	X	X	X			X		
E.2	X	X	X	X	X					

NUREG-0654/FEMA-REP-1	FEMA	NRC	DOE	EPA	FDA	HHS	DOT	USDA	DOI	DOC
E.5	X		X						X	X
E.6	X	X		X			X		X	X
E.7	X		X		X		X			
F.1.a	X		X							
F.1.b	X		X							
F.1.c	X		X				X			
F.1.d	X	X	X							
F.1.e	X		X						X	
F.2	X		X			X				
F.3				X	X	X		X	X	X
G.1	X				X	X		X	X	X
G.2	X									
G.3.a	X	X							X	X
G.4.a	X	X	X							
G.4.b	X									
G.4.c	X		X							
G.5	X		X							
H.3	X	X	X							
H.4	X	X	X							
H.7		X	X	X						
H.10		X	X		X					
H.11	X	X	X							
H.12		X	X		X					
I.7		X	X	X						
I.8		X	X	X	X					
I.9		X	X	X	X					
I.10		X	X	X	X					
I.11			X							
J.2									X	X
J.9				X	X					
J.10.a	X						X			
J.10.b	X						X			
J.10.c	X								X	X
J.10.d	X									

NUREG-0654/FEMA-REP-1	FEMA	NRC	DOE	EPA	FDA	HHS	DOT	USDA	DOI	DOC
J.10.e					X					
J.10.f					X					
J.10.g	X						X			
J.10.h	X					X	X			
J.10.i	X						X			
J.10.j	X		X				X			
J.10.k	X						X			
J.10.l	X						X			
J.10.m		X	X	X	X	X				
J.11	X			X	X			X		
J.12	X		X		X	X				
K.3.a	X	X	X	X	X					
K.3.b		X	X	X	X					
K.4	X		X	X	X					
K.5.a		X	X	X	X	X				
K.5.b		X	X	X	X	X				
L.1		X	X			X				
L.3	X	X			X	X				
L.4	X	X				X				
M.1	X		X	X	X					
M.3	X									
M.4			X	X	X					
N.1.a	X	X	X		X	X				
N.1.b	X	X	X		X					
N.2.a	X	X								
N.2.c	X	X								
N.2.d		X	X	X	X					
N.2.e	X	X	X	X	X					
N.3.a	X	X							X	X
N.3.b	X	X							X	X
N.3.c	X	X							X	X
N.3.d									X	X
N.3.e	X	X	X							
N.3.f	X	X							X	X

NUREG-0654/FEMA-REP-1	FEMA	NRC	DOE	EPA	FDA	HHS	DOT	USDA	DOI	DOC
N.4	X	X	X	X	X	X	X	X	X	X
N.5	X	X	X		X	X			X	X
O.1	X			X	X	X				
O.1.b	X			X		X				
O.4.a	X	X		X	X					
O.4.c		X	X	X	X					
O.4.d	X	X								
O.4.f	X	X				X				
O.4.g	X									
O.4.h	X					X				
O.4.j	X									
O.5	X		X							
P.1	X		X							
P.2	X		X							
P.3	X		X							
P.4	X	X	X							
P.5	X		X						X	X
P.6	X		X							
P.7	X	X								
P.8	X									
P.10	X									

The Regional Administrator "may make suggestions to [the State] concerning perceived gaps or deficiencies in the plans, and the State may amend the plan at any time prior to forwarding to the [FEMA Administrator]…" [44 CFR § 350.8(e)].

QUALIFYING EXERCISE

As part of the approval process, the state, appropriate local jurisdictions, and licensee must conduct a joint exercise. As stated in 44 CFR § 350.9(a), "Before a Regional [Administrator] can forward a State plan to the [FEMA Administrator] for approval, the State, together with all appropriate local governments, must conduct a joint exercise of that State plan, involving full participation of appropriate local government entities, the State and the appropriate licensee of the NRC." Full participation is defined in the regulation as follows:

"deficiencies" and "Deficiencies"

The term "deficiencies" as used in 44 CFR Part 350 (with a lower-case "d") refers collectively to all planning and preparedness issues. The definition of "Deficiency" (as the term is used now with a capital "D") was not established until 1993 in the NRC/FEMA Memorandum of Understanding (44 CFR Part 353, Appendix A).

- ORO emergency personnel are engaged in sufficient numbers to verify the capability to respond to the actions required by the accident scenario;
- Integrated capability to adequately assess and respond to an accident at a commercial NPP is tested; and
- Implementation of the observable portions of ORO plans/procedures are tested [44 CFR § 350.2(j)].

FEMA evaluates the exercise with assistance from the RAC. Within 48 hours of completion of the exercise, the Regional Administrator reports preliminary findings to exercise participants and Federal evaluators in a briefing. If the evaluation reveals any deficiencies, either in the plans/procedures themselves or in the ability of the relevant governments to implement them, FEMA must "make them known promptly in writing to appropriate State officials" [44 CFR § 350.9(a)]. FEMA then works with the State to resolve the deficiencies through plans/procedures revisions, a remedial exercise, or both.

The FEMA Regional Administrator, in forwarding the application for approval to FEMA Headquarters, must certify that an exercise as described above has been conducted and any deficiencies have been corrected [44 CFR § 350.9(b)].

PUBLIC MEETING

Following the qualifying exercise, but prior to approval, the FEMA Regional Administrator will ensure that at least one public meeting is held in the vicinity of the NPP. The purpose of the meeting is to provide information about the plans/procedures and exercise, answer questions, take comments and suggestions from the public on ways to improve preparedness, and explain how the plans/procedures are expected to function in a real emergency. The meeting is held after the joint exercise and include representatives from FEMA, the NRC, the licensee, and OROs [44 CFR § 350.10]. The public must be notified in advance of the meeting as follows [44 CFR § 350.10(b)]:

- Notice is given in the local newspaper with the largest circulation in the area, or other such media as the Regional Administrator may select, on at least two occasions. One occasion must be at least 2 weeks before the meeting and the other must be a few days before it.
- The Regional PIO prepares the announcement and provides it to the RAC Chair for approval. Then, the PIO can release it and notify all media outlets.
- Local radio and television stations are notified at least 1 week in advance.

If the public meeting reveals deficiencies in the plans/procedures or exercise, the Regional Administrator must inform the State and provide recommendations for improvement. No approval of plans/procedures and preparedness shall be made until the meeting described above has been held.

REGIONAL ADMINISTRATOR'S EVALUATION

The FEMA Regional Administrator evaluates the plans/procedures (and accompanying documentation) in accordance with the criteria in 44 CFR § 350.5, and reports on each Planning Standard. The accompanying documentation ("relevant record material") includes:

- The State and relevant ORO plans/procedures;
- Results of the exercise (deficiencies noted and corrections made);

- Summary of deficiencies identified during the public meeting; and
- Recommendations made to the State and actions or commitments by the State to improve plans/procedures and preparedness.

The Regional Administrator then forwards his or her evaluation along, with appropriate documentation, to the FEMA Administrator.

(4) Criteria for Review

The joint FEMA/NRC guidance document (NUREG-0654/FEMA-REP-1, Revision 1) established 16 Planning Standards and Evaluation Criteria for assessing radiological emergency preparedness at NPP sites. FEMA regulations specify that FEMA review of ORO plans/procedures and preparedness will be conducted according to the Planning Standards in NUREG-0654/FEMA-REP-1 and 44 CFR § 350.5. While the FEMA's regulations in 44 CFR § 350.5 specifically delineate only the Planning Standards from NUREG-0654/FEMA-REP-1, the associated Evaluation Criteria are adopted by reference in the regulation language.

(5) Assistance in Development of ORO Plans

Upon request, the FEMA Regional Office staff and RAC members provide OROs with technical assistance in developing their plans/procedures. Technical assistance includes review and comment on plans/procedures, but does not include the actual writing of plans/procedures (44 CFR § 350.6). The regulations list the agencies in the RAC as NRC, DOE, EPA, FDA, HHS, DOT, USDA, and DOC, and specify that the FEMA Region official will be the RAC Chair.

(6) FEMA Headquarters Review and Approval

Upon receipt of the Regional Administrator's evaluation and associated documentation, the FEMA Administrator will review these materials "as he or she shall deem necessary" and provide copies to other offices of FEMA and members of the FRPCC [44 CFR § 350.12(a)]. The final approval decision rests with the FEMA Administrator. Approval may be withheld pending review of other jurisdictions within that site's EPZs [44 CFR § 350.12(d)]. For example, where the EPZ for a site falls within two States, approval of one State's plans/procedures for the site might be withheld pending approval of the other State's plans/procedures for the site.

As set forth in 44 CFR § 350.12(b), offsite plans/procedures and preparedness will be approved only if they are:

- Adequate to protect the health and safety of the public living in the vicinity of the nuclear power facility, by providing reasonable assurance that appropriate protective measures can be taken offsite in a radiological emergency; and
- Capable of being implemented (e.g., adequacy and maintenance of procedures, training, resources, staffing levels, qualification, and equipment adequacy).

The FEMA Administrator's decision is concurrently communicated to the Governor, the NRC, and the Regional Administrator, and published in the *Federal Register*. If the application is not approved, the Deputy Administrator, NPD must indicate in writing the reasons for the decision and request improvements [44 CFR § 350.12(d)].

b. Continued Approval

After obtaining initial approval of plans/procedures and preparedness under 44 CFR Part 350, the State and/or Tribal Nation and local governments must:

- Conduct Federally evaluated biennial exercises for the site, and
- Report on the periodic requirements set forth in NUREG-0654/FEMA-REP-1, Revision 1.

(1) Exercises Required for Continuing Approval

The regulations spell out a required schedule of exercises to demonstrate continuing capability to protect the public [44 CFR § 350.9(c)].

- Each local jurisdiction within a site's plume pathway EPZ must fully participate in an exercise every 2 years. If a local jurisdiction is in the EPZ for more than one site, the FEMA Regional Administrator may seek approval from the Deputy Administrator, NPD for an exemption from this requirement for every site.
- Each State within the plume pathway EPZ for a power plant must fully participate in an exercise every 2 years. Full participation primarily refers to each organization demonstrating all the emergency phase capabilities outlined in its plans/procedures, including both facility and field-based functions. States with multiple sites may rotate the site at which they fully participate, and partially participate at the other sites. Partial

participation is defined as "engagement of State and local government emergency personnel in an exercise sufficient to adequately test direction and control functions for protective action decision-making related to Emergency Action Levels (EALs) and communication capabilities among affected State and local governments and the licensee."

- Ingestion pathway exercises are conducted at least once every 8 years.[97] For States with multiple sites, the ingestion pathway play is rotated among the sites. States impacted by the pathway from sites outside their borders must partially participate in the exercises held at those sites.
- The FEMA Regional Administrator may require jurisdictions to conduct remedial exercises to correct deficiencies found during regularly scheduled exercises.

Failure to exercise in accordance with this schedule "shall be grounds for withdrawing FEMA approval" [44 CFR § 350.9(f)].

(2) Periodic Requirements

FEMA determined that the periodic reporting requirements contained in NUREG-0654/FEMA-REP-1, Revision 1, could be accomplished through an ALC.

c. Withdrawal of Approval

Once approval has been granted under the process described above, it continues indefinitely. In other words, approval does not automatically expire after a set period of time. FEMA continues to provide determinations of reasonable assurance to the NRC on a biennial basis with transmittal of the exercise report to the NRC and the review of the ALC. However, the regulations define a process for withdrawing approval any time FEMA determines that planning and preparedness are no longer adequate to protect public health and safety.

Approval of planning and preparedness may be withdrawn through the process described in 44 CFR § 350.13. Under these regulations, the FEMA Administrator may initiate proceedings to withdraw approval any time that he or she "determines, on his or her own initiative…or on the basis of information another person supplied, that the State or local plan is no longer adequate to protect public health and safety by providing reasonable assurance that appropriate protective measures can be taken, or is no longer capable of being implemented…" [44 CFR § 350.13(a)]. Such a determination must be based on the same criteria applied to the approval process, namely, the Planning Standards and Evaluation Criteria in NUREG-0654/FEMA-REP-1.

To begin the procedure, the FEMA Administrator notifies the Governor of the affected State (through the FEMA Regional Administrator) and the NRC in writing. The notification cites the reasons for the determination of inadequacy, citing deficiencies in the plans/procedures or preparedness. The State then has 4 months to either correct the deficiencies or submit an acceptable plan for correcting them [44 CFR § 350.13(a)]. This period has been referred to in the program as a "120-day clock."

The State can submit a plan for correcting the Deficiencies and negotiate a timetable with the FEMA Administrator. If the Deficiencies are successfully corrected within the timetable, the FEMA Administrator ends the withdrawal action and notifies the Regional Administrator, the Governor, and the NRC. Notices are also published in the *Federal Register* and the newspaper of widest circulation in the affected State [44 CFR § 350.13(b)]. If the Deficiencies are not corrected within the allotted time, the FEMA Administrator withdraws approval. Notice of such withdrawal is given to the FEMA Regional Administrator, the Governor, and the NRC, and published as described above.

d. Appeals

Any time FEMA approval of planning and preparedness is granted or withdrawn by the FEMA Administrator, the decision may be appealed. The appeal may be made by "any interested person" [44 CFR § 350.15(a)]. Appeal of approval must be based on the grounds that the decision was unsupported by substantial evidence [44 CFR § 350.12(e)]. Appeal of withdrawal must be based on the grounds that the Deputy Administrator, NPD's decision was unsupported by substantial evidence based on the available record [44 CFR § 350.13(c)].

Written notice of the appeal must be submitted within 30 days of the date the approval decision is published in the *Federal Register*. The appeal letter must state specific reasons for the appeal and include an offer to provide supporting documentation.

[97] This requirement was changed from 6 years to 8 years by NUREG-0654/FEMA-REP-1, Supplement 4.

The FEMA Administrator (or designee) then reviews the file as submitted by the FEMA Regional Administrator, plus the appeal letter and its supporting documentation, to determine whether the decision was "supported by substantial evidence in the file and…consistent with FEMA policy" [44 CFR § 350.15(b)].

The decision by the FEMA Administrator (or designee) is published in the *Federal Register* and copies are provided to the appellant, the Governor, the NRC, and the licensee. The decision is considered final and not subject to review within FEMA "except upon a showing that it was procured by fraud or misrepresentation" [44 CFR § 350.15(c)].

e. Resources

FEMA REP resources can be obtained from the FEMA Website, http://www.fema.gov/about/divisions/thd_repp.shtm. The full set of FEMA REP regulations, along with NRC regulations and other Federal regulations and documents, can be obtained in print from the National Archives and Records Administration Website, http://www.gpoaccess.gov/cfr/index.html.

2. 44 CFR Part 351 – Radiological Emergency Planning and Preparedness

This part of the regulation establishes Federal agency roles and assigns tasks regarding Federal assistance to OROs in their radiological emergency planning and preparedness activities. This part is applicable to both fixed nuclear facilities and transportation accidents involving radiological material. This part does not cover Federal response, which is discussed in the NRF Nuclear/Radiological Incident Annex, June 2008.

44 CFR Part 351 also establishes two types of committees: FRPCC and the RACs. Membership of FRPCC includes FEMA, which chairs the committee, HHS, DOC, DOD, DOE, DOT, EPA, NRC, and USDA. Other agencies may be added as the incident warrants. The RACs have similar membership and are located in each of the FEMA Regions that have NPPs within their regional borders.

The FRPCC assists FEMA in providing policy direction for OROs' radiological emergency planning and preparedness activities. Subcommittees of the FRPCC are dedicated to research, training, emergency instrumentation, transportation, information, education, and Federal response. The FRPCC also assists FEMA with approval of State plans/procedures under 44 CFR Part 350 and assures that research efforts of its member agencies are coordinated with the Interagency Radiation Research Committee.

The RACs assist ORO officials in developing their radiological emergency plans/procedures, and review these plans/procedures and observe exercises to evaluate adequacy of the plans/procedures and preparedness.

3. 44 CFR Part 352 – Commercial NPP: Emergency Preparedness Planning

This part of the regulation deals with the situation where "State or local governments, either individually or together, decline or fail to prepare commercial nuclear power plant offsite radiological emergency preparedness plans/procedures that are sufficient to satisfy NRC licensing requirements or to participate adequately in the preparation, demonstration, testing, exercise, or use of such plans."

This part establishes the framework for review and evaluation of the adequacy of licensee offsite radiological emergency planning and preparedness, and for providing Federal assistance to licensees.

NUREG-0654/FEMA-REP-1, Supplement 1 provides additional guidance on the application of this regulation.

4. 44 CFR Part 353 – Fee for Services in Support, Review, and Approval of State and Local Government or licensee Radiological Emergency Plans and Preparedness

This part of the regulations establishes fees charged for site-specific radiological emergency planning and preparedness services rendered by FEMA, as authorized by 31 U.S.C. 9701.

44 CFR Part 353 also includes the FEMA/NRC Memorandum of Understanding (MOU) as Appendix A. The MOU establishes the framework for cooperation between FEMA and the NRC. The major areas of cooperation include NRC licensing review, FEMA review of offsite plans/procedures and preparedness, preparation for and evaluation of joint exercises, emergency planning and preparedness guidance, support for document management system, public information and education programs, and recovery from disasters affecting offsite emergency preparedness. The MOU also establishes an NRC/FEMA steering committee. The MOU also contains the first official definition of "Deficiency."

5. 44 CFR Part 354 – Fee for Services to Support FEMA's Offsite REP Program

44 CFR Part 354 establishes the methodology for FEMA to assess and collect user fees. The fees are to recover at least 100 percent of the amounts for the REP Program. There are both site-specific and flat fees. The site-specific component is related to plume pathway exercises and covers the costs of:

- Scheduling plume pathway biennial exercises;
- Reviewing plume pathway EPZ biennial exercise objectives and scenarios;
- Providing pre-plume pathway EPZ biennial exercise logistics;
- Conducting plume pathway EPZ biennial exercise, evaluations, and post-exercise briefing;
- Preparing, reviewing, and finalizing plume pathway EPZ biennial exercise reports;
- Giving notice and conducting public meetings; and
- Activities related to medical services and other drills in support of a biennial plume pathway exercise.

C. NON-PARTICIPATING STATE, TRIBAL, AND LOCAL GOVERNMENTS (NUREG-0654/FEMA-REP-1, SUPPLEMENT 1)

Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants – Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants, November 1980 (NUREG-0654/FEMA-REP-1, Supplement 1)

Supplement 1 expands on 44 CFR Part 352, which governs the offsite planning process in an instance where a State, local, and/or Tribal government(s) declines or fails to participate in preparing offsite emergency plans/procedures, or has significant planning or preparedness inadequacies and has not demonstrated the commitment or capabilities to correct those inadequacies. In such situations, the licensee will submit offsite plans/procedures, which will be reviewed following the process specified in 44 CFR § 350. This part of the regulation also provides the procedures for providing Federal resources to assist the licensee when the licensee has made a request under this part. Specific actions to take are delineated in 44 CFR Part 352.

D. EARLY SITE PERMIT APPLICATIONS (NUREG-0654/FEMA-REP-1, SUPPLEMENT 2)

Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants – Criteria for Emergency Planning in an Early Site Permit Application, Draft Report for Comment, March 1996 (NUREG-0654/ FEMA-REP-1, Supplement 2)

Supplement 2 provides additional detailed guidance on the requirements and procedures applicable to issuance of an Early Site Permit found in Subpart A of 10 CFR Part 52. An ESP is an optional step whereby an applicant obtains NRC approval of a reactor site prior to submittal of a Combined License application as described in Subpart C of 10 CFR § 52. NUREG-0654/FEMA-REP-1, Supplement 2 provides guidance for ESP applicants and NRC and FEMA reviewers in the preparation and evaluation of the emergency planning aspects of ESP applications. This supplement includes application and review guidance regarding (1) identification of physical characteristics that could pose a significant impediment to development of emergency plans/procedures; (2) contacts and arrangements with local, State, and Federal agencies with emergency planning responsibilities; and (3) submittal of either major features of emergency plans/procedures or complete and integrated emergency plans/procedures. Emergency plans/procedures submitted under the major features of emergency plans/procedures provision of Supplement 2 are evaluated against selected and modified emergency Planning Standards and Evaluation Criteria from Section II of NUREG-0654/FEMA-REP-1, Revision 1.

NOTE: Although there is no NUREG-0654/FEMA-REP-1 supplement addressing combined licensing, the process has been fully outlined in the New Reactor Licensing Standard Operating Procedure. This document is available at www.fema.gov/about/divisions/thd_repp.shtm

E. PROTECTIVE ACTION STRATEGIES (NUREG-0654/FEMA-REP-1, SUPPLEMENT 3)

Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants – Guidance for Protective Action Strategies (NUREG-0654/FEMA-REP-1, Supplement 3)

Supplement 3 provides guidance for use in developing site specific protective action strategies for implementation during a General Emergency at an NPP. The revised supplement provides background information and a protective action logic development tool that should be used by licensees to develop site specific protective action recommendation procedures and is recommended for use by OROs to develop protective action strategy guidance for decision makers. In addition, Supplement 3, Revision 1, contains guidance for enhancing public information materials and emergency messaging, including further considerations for individuals and populations with disabilities and access/functional needs.

In late 2004, the NRC initiated a project to analyze the relative efficacy of alternative protective action strategies in reducing consequences to the public from a spectrum of NPP core melt accidents. The study is documented in NUREG/CR-6953, "Review of NUREG-0654, Supplement 3, 'Criteria for Protective Action Recommendations for Severe Accidents,'" Volumes 1 (2007), 2 (2008) and 3 (2010). The study provides a technical basis for enhancing protective action guidance and contributed to the revision of Supplement 3. Input from State and local government emergency response professionals, stakeholders, and industry was also incorporated.

The guidance of Supplement 3, provides an acceptable method to comply with 10 CFR § 50.47(b)(10) in development of a range of protective actions for the plume EPZ. However, alternative methods may also be acceptable and may be submitted for consideration.

F. EXERCISE METHODOLOGY, MORE CHALLENGING DRILLS AND EXERCISES, AND BACKUP ALERT AND NOTIFICATION REQUIREMENTS (NUREG-0654/FEMA-REP-1, SUPPLEMENT 4)

Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants – Criteria for National Preparedness Initiative Integration, Exercise Enhancement, and Backup Alert and Notification Systems (NUREG-0654/FEMA-REP-1, Supplement 4)

Supplement 4 provides additional guidance for the development, review, and evaluation of offsite radiological emergency response planning and preparedness surrounding the Nation's commercial NPPs on four emerging issues:

1. **Integration of National Preparedness Initiatives into ORO Plans and Activities:** integration of NIMS/ ICS and National Exercise Program/HSEEP concepts into offsite emergency response plans and activities.
2. **Coordination between OROs and Licensees during a Hostile Action-Based Incident:** unique challenges posed during HAB incidents regarding the capability of OROs to respond to the NPP site while maintaining offsite response capabilities.
3. **Challenging Drills and Exercises:** developing exercise scenarios that incorporate a broader spectrum of options regarding releases and initiating events to increase realism and to minimize participant preconditioning.
   - Predictability of Emergency Classification Levels (ECLs);
   - Varying Radiological Release Options;
   - Varying Radiological Release Conditions; and
   - Broader Spectrum of Initiating Events.
4. **Backup Means for Alert and Notification Systems:** requirements for backup capabilities for both alert and notification functions.

New requirements set forth in this Supplement include:

- Three new Evaluation Criteria:
  - C.6 – addresses coordination of onsite and offsite response in an HAB incident;
  - N.1.c – requires off-hours and unannounced exercises for the licensee only; and
  - N.1.d – identifies specific ORO requirements for demonstration of ingestion pathway response.
  - Exercise scenario variations, including no/minimal release, HAB incidents, and rapidly escalating incidents.
  - Change in the exercise cycle length from 6 years to 8 years.
  - A full backup to the Alert and Notification System.

G. DEMONSTRATION CONSIDERATIONS FOR NO/MINIMAL RELEASE SCENARIOS

OROs can utilize these defined methods to address all applicable exercise demonstration criteria in a No/Minimal Release Scenario that does not progress to a General Emergency declaration during a biennial exercise without the need to extend the exercise or conduct additional out-of-sequence exercises.

A No/Minimal Release Scenario is required once every eight years for licensees and is an option for OROs once every eight years. If OROs decide not to participate in such an exercise, they must participate in a "traditional" scenario response that involves a General Emergency declaration and a resulting PAR/PAD process. There are currently **32** Demonstration Criteria of which **7** apply *only* to an Ingestion/Post-Plume scenario and **1** applies *only* to a MS-1 Drill. This leaves **24** criteria focused solely on a plume exposure pathway exercise.

Of the **24** plume exposure pathway criteria, **17** are required to be demonstrated biennially at *each* appropriate location. The remaining **7** criteria are not required to be demonstrated biennially, but no less than once every eight years at each appropriate location. These **7** criteria include:

- 1.b.1 – Facilities
- 3.c.1 and 3.c.2 – Implementation of Protective Actions for Persons with Disabilities and Access/Functional Needs
- 5.a.3 – Activation of the Prompt Alert and Notification System
- 6.a.1 – Monitoring, Decontamination, and Registration of Evacuees
- 6.b.1 – Monitoring and Decontamination of Emergency Workers and their Equipment and Vehicles
- 6.c.1 – Temporary Care of Evacuees

Of the **17** biennial criteria, **7** criteria *are not* impacted by a No/Minimal Release Scenario and require no special considerations in order to be demonstrated:

- 1.a.1 – Mobilization
- 1.c.1 – Direction and Control
- 1.d.1 – Communications Equipment
- 1.e.1 – Equipment and Supplies to Support Operations
- 5.a.1 and 5.a.4 – Activation of the Prompt Alert and Notification Systems
- 5.b.1 – Subsequent Emergency Information and Instructions for the Public and the Media

The following **10** criteria may require special consideration when being demonstrated during a No/Minimal Release Scenario:

- 2.a.1 – Emergency Worker Exposure Control
- 2.b.1 and 2.b.2 – Radiological Assessment and Protective Action Recommendations and Decisions for the Plume Phase of the Emergency
- 2.c.1 – PAD Consideration for the Protection of Persons with Disabilities and Access/Functional Needs
- 3.a.1 – Implementation of Emergency Worker Exposure Control
- 3.b.1 – Implementation of KI Decision for Institutionalized Individuals and the Public
- 3.d.1 and 3.d.2 – Implementation of Traffic and Access Control
- 4.a.2 and 4.a.3 – Plume Phase Field Measurement and Analyses

The following matrix shows how these remaining **10** criteria can be demonstrated during a No/Minimal Release Scenario.

Exhibit IV-2: Considerations for Demonstrating the 10 Criteria during a No/Minimal Release Scenario

All activities described below will be negotiated and agreed upon within the Extent of Play Agreement. All demonstrations will be completed in accordance with the Extent-of-Play Agreement.

ASSESSMENT AREA 2. PROTECTIVE ACTION DECISION-MAKING	
2.a.1 – Emergency Worker Exposure Control	
Sub-Element	**Means of Demonstration per Negotiated Extent of Play**
OROs use a decision-making process, considering relevant factors and appropriate coordination, to ensure that an exposure control system, including the use of KI, is in place for emergency workers, including provisions to authorize radiation exposure in excess of administrative limits or protective action guides. As appropriate, OROs must demonstrate the capability to make decisions on the distribution and administration of KI as a protective measure for emergency workers, based on their plans/procedures or projected thyroid dose compared with the established PAGs for KI administration.	OROs would be expected to make a decision on the need for KI, based on relevant factors and appropriate coordination.
	Participating OROs must also demonstrate the capability to make decisions concerning authorization of exposure levels in excess of pre-authorized levels and the number of emergency workers receiving radiation doses above pre-authorized levels.
	The decision on the distribution and administration of KI as a protective measure for emergency workers and the authorization process for emergency workers to exceed pre-authorized levels can be addressed through an interview.
2.b.1 – Radiological Assessment and Protective Action Recommendations and Decisions for the Plume Phase of the Emergency	
Sub-Element	**Means of Demonstration per Negotiated Extent of Play**
Appropriate protective action recommendations (PARs) are based on available information on plant conditions, field monitoring data, and licensee and ORO dose projections, as well as knowledge of onsite and offsite environmental conditions. The ORO must demonstrate the capability to use appropriate means, described in the plans/procedures, to develop PARs for decision-makers based on available information and recommendations provided by the licensee as well as field monitoring data, if available. The ORO must also consider any release and meteorological data provided by the licensee.	OROs would be expected to make a decision on the need for a PAR (evacuation and/or sheltering), based on plant conditions, field monitoring data, and licensee and ORO dose projections, as well as knowledge of onsite and offsite environmental conditions, including release and meteorological data provided by the licensee.
	The ORO must demonstrate a reliable capability to independently validate dose projections. In all cases, calculation of projected dose must be demonstrated. When the licensee and ORO projected doses differ by more than a factor of 10, the ORO and licensee must determine the source of the difference by discussing input data and assumptions, using different models, or exploring possible reasons. Actual data and/or "what if" calculations will be made to determine the scope of the release, including confirming if no release has occurred.
	The decision-making process used to make PARs can be addressed through an interview.

2.b.2 – Radiological Assessment and Protective Action Recommendations and Decisions for the Plume Phase of the Emergency	
Sub-Element	**Means of Demonstration per Negotiated Extent of Play**
A decision-making process involving consideration of appropriate factors and necessary coordination is used to make protective action decisions (PADs) for the general public (including the recommendation for the use of KI, if ORO policy). OROs must have the capability to make both initial and subsequent PADs. OROs must demonstrate the capability to make initial PADs in a timely manner appropriate to the incident, based on information from the licensee, assessment of plant status and potential or actual releases, other available information related to the incident, input from appropriate ORO authorities (e.g., incident command), and PARs from the utility and ORO staff. In addition, a subsequent or alternate PAD may be appropriate if various conditions (e.g., an HAB incident, weather, release timing and magnitude) pose undue risk to an evacuation, or if evacuation may disrupt the efforts to respond to a hostile action.	OROs would be expected to make a decision on the need for a PAD (evacuation and/or sheltering), considering appropriate factors, and necessary coordination.
	The decision-making process used to make PADs can be addressed through an interview.
	Precautionary actions/measures can be, and are, made by OROs at a Site Area Emergency, to include: placing animals on stored feed and water, transfer of school children, and establishing air and waterway restrictions, etc.

2.c.1 – PAD Consideration for the Protection of Persons with Disabilities and Access/Functional Needs	
Sub-Element	**Means of Demonstration per Negotiated Extent of Play**
PADs are made, as appropriate, for groups of people with disabilities and those with access/ functional needs. Factors that must be considered include weather conditions, shelter availability, availability of transportation assets, risk of evacuation versus risk from the avoided dose, and precautionary school evacuations. In addition, decisions must be coordinated/ communicated with the incident command. In situations where an institutionalized population cannot be evacuated, the ORO must consider use of KI.	OROs would be expected to make a decision on the need for a PAD (evacuation and/or sheltering), considering appropriate factors and necessary coordination.
	Applicable OROs must demonstrate the capability to alert and notify all public school systems/districts of emergency conditions that are expected to, or may necessitate, protective actions for students. Demonstration requires that the OROs actually contact public school systems/districts during the exercise. Many, if not all, OROs accomplish this during an Alert or Site Area Emergency. If not, the decision-making process used to make PADs can be addressed through an interview.

ASSESSMENT AREA 3: PROTECTIVE ACTION IMPLEMENTATION	
3.a.1 – Implementation of Emergency Worker Exposure Control	
Sub-Element	**Means of Demonstration per Negotiated Extent of Play**
The OROs issue appropriate dosimetry, KI, and procedures, and manage radiological exposure to emergency workers in accordance with the plans/ procedures. Emergency workers periodically and at the end of each mission read their dosimeters and record the readings on the appropriate exposure record or chart. OROs maintain appropriate record-keeping of the administration of KI to emergency workers.	OROs must demonstrate the capability to brief personnel; issue appropriate dosimetry, KI, and procedures; manage radiological exposure to emergency workers; and ensure that emergency workers periodically and at the end of each mission read their dosimeters and record the readings on the appropriate exposure record or chart. Many, if not all, OROs accomplish this during an Alert or Site Area Emergency. If not, the process to ensure EW exposure control is implemented can be addressed through an interview.
3.b.1 – Implementation of KI Decision for Institutionalized Individuals and the Public	
Sub-Element	**Means of Demonstration per Negotiated Extent of Play**
KI and appropriate instructions are available if a decision to recommend use of KI is made. Appropriate record-keeping of the administration of KI for institutionalized individuals is maintained.	OROs would be expected to make a *decision* on the need for KI, based on relevant factors and appropriate coordination. The decision-making process on the need to recommend use of KI can be addressed through an interview, in accordance with the Extent of Play Agreement.
3.d.1 – Implementation of Traffic and Access Control	
Sub-Element	**Means of Demonstration per Negotiated Extent of Play**
Appropriate traffic and access control is established. Accurate instructions are provided to traffic and access control personnel.	OROs must demonstrate the capability to select, establish, and staff appropriate traffic and access control points consistent with current conditions and PADs (e.g., evacuating, sheltering, relocation, etc.) in a timely manner. Traffic and access control staff must demonstrate accurate knowledge of their roles and responsibilities. These capabilities may be demonstrated by actual deployment or by interview, in accordance with the Extent of Play Agreement.
3.d.2 – Implementation of Traffic and Access Control	
Sub-Element	**Means of Demonstration per Negotiated Extent of Play**
Impediments to evacuation are identified and resolved.	At least one impediment must remain in place during the evacuation, does not necessarily need to occur on an evacuation route, and should be such that re-routing of traffic is required. The impediment should result in, and must remain in place long enough, for demonstration of the decision-making and coordination with the JIC to communicate the alternate route to evacuees leaving the area. These capabilities may be demonstrated by actual deployment, through Controller inject, or by interview, in accordance with the Extent of Play Agreement.

ASSESSMENT AREA 4: FIELD MEASUREMENTS AND ANALYSES	
4.a.2 – Plume Phase Field Measurement and Analyses	
Sub-Element	**Means of Demonstration per Negotiated Extent of Play**
Field teams (2 or more) are managed to obtain sufficient information to help characterize the release and to control radiation exposure.	FMTs are dispatched to a standby location, usually at a Site Area Emergency, and monitor dose rates. This data would be very limited during a No/Minimal Release Scenario, however it would still be vital to characterizing the limited release or used to verify that no release occurred. Responsible OROs must demonstrate the capability to brief FMTs on predicted plume location, direction, and travel speed and exposure control procedures before deployment. FMTs must be directed to take measurements at such locations and times as necessary to provide sufficient information to characterize the plume and its impacts.
4.a.3 – Plume Phase Field Measurement and Analyses	
Sub-Element	**Means of Demonstration per Negotiated Extent of Play**
Ambient radiation measurements are made and recorded at appropriate locations, and radioiodine and particulate samples are collected. Teams will move to an appropriate low background location to determine whether any significant (as specified in the plan and/or procedures) amount of radioactivity has been collected on the sampling media.	Two or more FMTs must demonstrate the capability to make and report measurements of ambient radiation to the field team coordinator, dose assessment team, or other appropriate authority. FMTs must also demonstrate the capability to obtain an air sample for measurement of airborne radioiodine and particulates, and to provide the appropriate authority with field data pertaining to measurement. If samples have radioactivity significantly above background, the authority must consider the need for expedited laboratory analyses of these samples. OROs must share data in a timely manner with all other appropriate OROs. As stated above, field teams will be dispatched and monitor dose rates. An air sample could be demonstrated at the first location dispatched, independent of a trigger level for an air sample, per the negotiated Extent of Play. In accordance with plans and procedures, the level at which an air sample would be taken could be discussed via interview.

H. INTEGRATION OF REP DEMONSTRATION CRITERIA AND CORE CAPABILITIES

The REP program has adopted the HSEEP exercise documentation format in order to be consistent with national preparedness and exercise initiatives. Although the goals of the REP and HSEEP exercise evaluation methodologies are the same – the assessment of response and recovery capabilities and identification of items that need to be improved – the REP program has traditionally expressed exercise outcomes in terms of Demonstration Criteria and reasonable assurance, whereas HSEEP uses core capabilities. Integrating the two exercise methodologies so that they are "speaking the same language" has several major benefits:

- OROs that have already adopted the HSEEP methodology will now be able to use the same processes and report formats for their REP and HSEEP exercise activities;
- OROs can use REP After-Action Reports (AARs) to document progress toward their overall preparedness and core capability targets; and
- OROs that are required to use the HSEEP methodology because they receive Federal preparedness grant funds can use REP AARs to satisfy grant spending documentation requirements.

To facilitate the integration process, FEMA has developed two tools: the Demonstration Criteria- Core Capability crosswalk and REP-specific Exercise Evaluation Guides (EEGs).

The information in this subpart includes the following three sections:

- Demonstration Criteria-Core Capability Crosswalk;
- EEGs; and
- Customizing EEGs for an Exercise.

1. Demonstration Criteria-Core Capability Crosswalk

The crosswalk was developed as a starting point for translating the REP Demonstration Criteria into applicable core capabilities from the National Preparedness Goal and Frameworks. FEMA reviewed the extent of play associated with each REP Demonstration Criterion and compared it with the core capabilities to identify similarities. The resulting crosswalk provides a "menu" of potential correlations between each REP Demonstration Criterion and the core capabilities, rather than a "one-size-fits-all" prescriptive list. The crosswalk is found in Exhibit IV-3.

Exhibit IV-3: Demonstration Criteria-Core Capabilities Crosswalk

REP Assessment Areas and Demonstration Criteria	Core Capabilities by Mission Area	Common			Prevention				Protection							
		Planning	Public Information and Warning	Operational Coordination	Forensics and Attribution	Intelligence and Information Sharing	Interdiction and Disruption	Screening, Search, and Detection	Access Control and Identity Verification	Cybersecurity	Intelligence and Information Sharing	Interdiction and Disruption	Physical Protective Measures	Risk Management for Protection Programs and Activities	Screening, Search, and Detection	Supply Chain Integrity
Emergency Operations Management	1.a.1															
	1.b.1															
	1.c.1			X												
	1.d.1															
	1.e.1															
Protective Action Decision-Making	2.a.1			X												
	2.b.1			X		X					X					
	2.b.2			X		X					X					
	2.c.1			X												
	2.d.1			X												
	2.e.1			X												
Protective Action Implementation	3.a.1			X												
	3.b.1		X	X												
	3.c.1		X	X												
	3.c.2			X												
	3.d.1			X												
	3.d.2			X												
	3.e.1			X												
	3.e.2		X	X												
	3.f.1			X												
Field Measurement and Analysis	4.a.2			X												
	4.a.3															
	4.b.1															
	4.c.1															
Emergency Notification and Public Information	5.a.1		X	X												
	5.a.3		X													
	5.a.4		X													
	5.b.1		X													
Support Operations/ Facilities	6.a.1															
	6.b.1															
	6.c.1			X												
	6.d.1			X												

		REP Assessment Areas and Demonstration Criteria																															
		Emergency Operations Management					Protective Action Decision-Making						Protective Action Implementation									Field Measurement and Analysis				Emergency Notification and Public Information				Support Operations/ Facilities			
	Core Capabilities by Mission Area	1.a.1	1.b.1	1.c.1	1.d.1	1.e.1	2.a.1	2.b.1	2.b.2	2.c.1	2.d.1	2.e.1	3.a.1	3.b.1	3.c.1	3.c.2	3.d.1	3.d.2	3.e.1	3.e.2	3.f.1	4.a.2	4.a.3	4.b.1	4.c.1	5.a.1	5.a.3	5.a.4	5.b.1	6.a.1	6.b.1	6.c.1	6.d.1
Mitigation	Community Resilience																																
	Long-Term Vulnerability Reduction																																
	Risk and Disaster Resilience Assessment																																
	Threat and Hazard Identification																																
Response	Critical Transportation														X	X	X	X			X												
	Environmental Response/Health and Safety					X	X	X	X		X	X	X	X	X	X									X					X	X		X
	Fatality Management Services																																
	Infrastructure Systems																	X															
	Mass Care Services					X																								X		X	
	Mass Search and Rescue Operations																																
	On-Scene Security and Protection																X																
	Operational Communications	X		X	X			X	X	X																X	X	X	X				
	Public and Private Services and Resources					X								X																			
	Public Health and Medical Services					X																											X
	Situational Assessment			X			X	X	X	X	X	X										X											
Recover	Economic Recovery											X									X												
	Health and Social Services											X									X												
	Housing											X									X												
	Infrastructure Systems																																
	Natural and Cultural Resources											X									X												

2. Exercise Evaluation Guides

FEMA has developed REP-specific, core capability-based EEGs for use during REP exercises. These EEGs enable users to meet the traditional reasonable assurance standards of the REP Program as well as address and document performance thresholds for each core capability. Each EEG includes the following:

- **Core capabilities:** The distinct critical elements necessary to achieve a specific mission area (e.g., prevention). To assess both capacity and gaps, each core capability includes capability targets.
- **Capability target(s):** The performance thresholds for each core capability; they state the exact *amount* of capability that players aim to achieve. Capability targets are typically written as quantitative or qualitative statements.
- **Critical tasks:** The distinct elements required to perform a core capability; they describe *how* the capability target will be met. Critical tasks generally include the activities, resources, and responsibilities required to fulfill capability targets. Capability targets and critical tasks are based on operational plans, policies, and procedures to be exercised and tested during the exercise.
- **Performance ratings:** The summary description of performance against target levels. Performance ratings include both Target Ratings, describing how exercise participants performed relative to each capability target, and Core Capability Ratings, describing overall performance relative to entire the core capability.

Additional information regarding the generic use and structure of the core capability-based EEGs can be found within *Homeland Security Exercise and Evaluation Program (HSEEP)*, April 2013.

The most current versions of the master REP EEGs are available on the REP website.

3. Customizing EEGs for an Exercise

During the exercise planning process, the FEMA Region customizes the master core capability-based EEGs for the objectives and Demonstration Criteria scheduled for evaluation during the exercise. The Regions may involve the exercise planning team in the customization process. The EEGs are customized to reflect the response structure established in the applicable OROs' plans and procedures. This tailoring process results in a set of EEGs that have been modified to reflect each ORO's response approach and the applicable REP Demonstration points of review found in the Exercise Preparation Guide.

I. SUBMITTING BEST PRACTICES ON THE FEMA WEBSITE

Public Domain Documents

All submitted exercise-related Best Practices must be included in the After-Action Report of an exercise. This will be considered a public domain document and allow FEMA to put it on the website.

Best Practices are exemplary methods and/or unique approaches that lead to innovative, enhanced emergency preparedness and response that have been noted by FEMA during various REP Program activities.

The following guide assists State and FEMA Regional personnel with development, submission, and review of Best Practices for inclusion on the FEMA website. These procedures will assure that best practices and ideas are available to all communities surrounding nuclear power plants.

When a Best Practice is noticed during an exercise, training, or plan review FEMA staff will complete Exhibit IV-4: Best Practice Submission Form and submit to the RAC Chair, or their designee. Upon RAC Chair approval, the information will then be forwarded to FEMA Headquarters. Supporting materials (e.g., pictures, documents, videos, etc.) should be included with the initial submission. Any pictures that are submitted must include a description and the names of the individuals in the picture. Any member of the public in the photograph must complete the form in Exhibit IV-5: Photographic/Video/Audio Consent & Release and/or Exhibit IV-6: Parent Consent & Release Form for Photographic/Video/Audio Recording.

Once the proposed approach is received by FEMA Headquarters, the proposal will be reviewed by the following:

- THD Policy
- Legal Counsel
- REP Program Branch Chief

Exhibit IV-4: Best Practice Submission Form

Best Practice Submission Form	
Best Practice Topic	
Describe the area of the REP Program that this Best Practice applies to (e.g., training, exercises, planning, etc.).	
Describe the applicable planning standard and/or evaluation criteria most appropriate to this Best Practice.	
Description of Best Practice	
Describe, in detail, the Best Practice. This should include training, exercise, and/or plan information as well as any other information being used. Include all relevant supporting materials (e.g., documents, forms, video, or descriptions of equipment) as attachments. Provide any supporting items in electronic format so that they may be added to the website. Acceptable formats include .tiff, .jpg, .png, .txt, and .pdf.	
Agency that Employs the Best Practice	
Include all entities, be specific.	
Submitter's Contact Information	
Include Name, Title, and contact information.	
Signature of RAC Chair or Designee	

Best Practice Submission Form	
Additional Information	
If applicable, which exercise After-Action Report includes this as a Best Practice?	
If the Best Practice was not captured within an After-Action Report, the appropriate agency/ jurisdiction involved must sign here for approval to publish on the FEMA website.	
Additional comments may be added here.	

Exhibit IV-5: Photographic/Video/Audio Consent & Release

Federal Emergency Management Agency

Photographic/Video/Audio Consent & Release

I consent and agree that the Federal Emergency Management Agency ("FEMA") and the United States Government ("Government") will have the right to take photographs or record video of me (and of my property), and to record my voice, and to use all these in any media format.

I also agree that my name, identity, and the content of my spoken words may be revealed in these media or by descriptive text, transcription or commentary. I understand that my likeness, my voice, images of my property or business, and my personal name or my business name may be used by FEMA and the Government and disseminated though various media, including the Internet, radio and television and via CD-ROM.

I release to FEMA and the Government all rights to exhibit the described works in print, photographic and electronic form publicly or privately.

I wave any rights, claims or interest I may have to control the use of my identity or likeness in the photographs or videos taken of me, as well as any rights I may have in my recorded voice, or to images of my property or business, and agree that any of these uses of the video/photograph/audio may be made without compensation or additional consideration to me.

I represent that I am at least 18 years of age, that I have read and understand the above statement, and that I am competent to execute this consent and release.

Name: _____ Signature: _____

Address: _____ Phone: _____

_____

Witness for FEMA: _____ Photo ID Number: _____

Federal Emergency Management Agency

Photographic/Video/Audio Consent & Release

I consent and agree that the Federal Emergency Management Agency ("FEMA") and the United States Government ("Government") will have the right to take photographs or record video of me (and of my property), and to record my voice, and to use all these in any media format.

I also agree that my name, identity, and the content of my spoken words may be revealed in these media or by descriptive text, transcription or commentary. I understand that my likeness, my voice, images of my property or business, and my personal name or my business name may be used by FEMA and the Government and disseminated though various media, including the Internet, radio and television and via CD-ROM.

I release to FEMA and the Government all rights to exhibit the described works in print, photographic and electronic form publicly or privately.

I wave any rights, claims or interest I may have to control the use of my identity or likeness in the photographs or videos taken of me, as well as any rights I may have in my recorded voice, or to images of my property or business, and agree that any of these uses of the video/photograph/audio may be made without compensation or additional consideration to me.

I represent that I am at least 18 years of age, that I have read and understand the above statement, and that I am competent to execute this consent and release.

Name: _____ Signature: _____

Address: _____ Phone: _____

_____

Witness for FEMA: _____ Photo ID Number: _____

Exhibit IV-6: Photographic/Video/Audio Parental Consent & Release

Federal Emergency Management Agency

Parent Consent & Release Form for Photographic/Video/Audio

I consent and agree that the Federal Emergency Management Agency ("FEMA") and the United States Government ("Government") can take photographs of the child/children named below. I also agree that his/her/their name(s) can be used in photo captions.

These photographs may be posted on the FEMA web site (www.fema.gov) and/or included in the FEMA photo archive, both of which are fully accessible by the public. These photographs may be used for information/educational purposes, per the FEMA photo usage agreement. The photographs are not intended to be sold.

I release to FEMA and the Government all rights to exhibit the described works in print, photographic and electronic form.

I represent that I have read and understood the above statement, and that I am competent to execute this consent and release.

Name of Parent/Guardian: _____ Date: _____

Signature: _____ Phone: _____

Address: _____

_____

Name of Child/Children: _____

_____

Consent Obtained By: _____ Photo ID Number: _____

Federal Emergency Management Agency

Parent Consent & Release Form for Photographic/Video/Audio

I consent and agree that the Federal Emergency Management Agency ("FEMA") and the United States Government ("Government") can take photographs of the child/children named below. I also agree that his/her/their name(s) can be used in photo captions.

These photographs may be posted on the FEMA web site (www.fema.gov) and/or included in the FEMA photo archive, both of which are fully accessible by the public. These photographs may be used for information/educational purposes, per the FEMA photo usage agreement. The photographs are not intended to be sold.

I release to FEMA and the Government all rights to exhibit the described works in print, photographic and electronic form.

I represent that I have read and understood the above statement, and that I am competent to execute this consent and release.

Name of Parent/Guardian: _____ Date: _____

Signature: _____ Phone: _____

Address: _____

_____

Name of Child/Children: _____

_____

Consent Obtained By: _____ Photo ID Number: _____

J. APPROVAL PROCESS FOR ALTERNATIVE APPROACHES

The Evaluation Criteria in NUREG-0654/FEMA-REP-1 provide approved approaches to meet the regulatory requirements of the REP Program. However, FEMA recognizes that other approaches may be appropriate and therefore presents a process for review and approval of alternative approaches. In order for an alternative approach to be considered by FEMA, it must meet or surpass current standards. This section provides instructions detailing the approval process.

1. Initial submission

OROs submit a formal written request outlining the proposed alternative approach through the State to the FEMA Regional Office.

The request includes:

- Jurisdiction(s) affected/involved
- Relevant evaluation criteria (i.e., A.1, N.2.b, etc.)
- Explanation regarding how the currently approved approach is not sufficient for the jurisdiction (e.g., statues and regulations prohibit the currently approved approach, terrain/weather conditions prohibit the use of certain equipment, and/or distance from facilities inhibits response times, etc.).
- The alternative approach. This includes sufficient detail and any materials (e.g., forms, SOPs, etc.) necessary to ensure clarity. Ensure there is no decrease in public health and safety.
- Description of how the proposed alternative approach differs from the previous approach and how it will be demonstrated.

2. Regional Recommendation

The FEMA Regional Office and RAC Chair will review the OROs' proposal and determine whether to endorse the alternative approach. Other RAC members may be consulted for additional information. The FEMA Regional Office will forward their written recommendation, which will include an explanation of how the recommendation was formulated, along with the proposal, to FEMA Headquarters within 30 days of the initial submission date.

If the FEMA Regional Office and RAC Chair do not recommend acceptance of the proposal, an attempt should be made to discuss the proposal with the State and/or submitting OROs and determine a mutually acceptable solution. If this approach is not successful, then the FEMA Regional Office will send the proposal to FEMA Headquarters with a written statement explaining why the alternative approach was not endorsed.

3. FEMA Headquarters Approval

Once the proposed alternative approach is received by FEMA Headquarters, the proposal will be reviewed by the following:

- THD Policy
- Legal Counsel
- REP Program Branch Chief

FEMA Headquarters will send a disposition letter within 90 days of the initial submission date with an explanation of the decision to accept or reject the alternative approach. Final approval will be contingent on the successful demonstration of the alternative approach.

4. Alternative Approach Demonstration

In consultation with the OROs, the FEMA Regional Office will determine the appropriate time and location for the demonstration of the proposed alternative approach. Assessment of alternative approach may be accomplished during a biennial exercise, actual event, out-of-sequence evaluation, site assistance visits or by means of drills or seminars conducted at any time.

If the alternative approach is related to equipment, then system familiarity must demonstrate technical proficiency. If the alternative approach requires the use of plant conditions, coordination with the licensee is recommended.

If the demonstration of the alternative approach is during a biennial exercise or drill ensure the extent of play is written to indicate how to handle an unsuccessful demonstration.

Assessment of the alternative approach will include FEMA Regional and Headquarters representation. The FEMA Regional Office, RAC Chair and FEMA Headquarters will review the AAR and determine whether to endorse the approach. When the alternative approach is demonstrated during training then the FEMA Regional Office will need to provide a written report detailing the actions taken and its' outcome. If the demonstration was successful, FEMA Headquarters will provide the OROs with an approval letter containing the alternative approach and the date of its successful completion.

Copies of approved alternative approach proposals and supporting documentation will be kept on file with both the FEMA Regional Office and FEMA Headquarters.

All approved alternative approaches will be reviewed prior to the OROs biennial exercise to ensure the alternative approach remains current

K. EMERGENCY PLANNING ZONE BOUNDARY CHANGES

In accordance with NUREG-0654/FEMA-REP-1, Revision 1, an EPZ is defined as the area surrounding an NPP for which planning is needed to ensure that prompt and effective actions can be taken to protect the public in an accident or incident at the site. Generally, the plume exposure pathway of the EPZ is an area about 10 miles in radius, and the ingestion pathway is about 50 miles in radius.

If an ORO wants to change the boundary of an existing EPZ, the proposal must be submitted to the FEMA Regional Administrator or his/her designee, usually the RAC Chair. The proposal shall include, but not be limited to:

- Action by appropriate ORO officials desiring the change to the boundary (i.e., resolution by elected official, etc.);
- Description of the change to the boundary;
- Discussion of the population affected by the change;
- Effect that the change has on evacuation routes or evacuation time estimates; and
- Maps showing the existing EPZ boundary and proposed new boundary.

FEMA and the RAC will review the request on its merits. After the regional review, the request and RAC recommendation will be forwarded to FEMA Headquarters for final action.

If the EPZ boundary change is approved, the approval is contingent on the ORO submitting for review the appropriate changes to their plans/procedures, maps of the EPZ, public information material, and impact that the addition or subtraction of population from the EPZ has on the evacuation time estimates. The required information would include changes to the geographical boundary descriptions and the ANS, including additional sirens or other means for public notification. Any modifications to an ANS must be consistent with Section V, Part A of this Manual, Alert and Notification Systems.

L. CREDENTIALING FRAMEWORK

REP Program Credentialing Framework, December 2010

Credentialing is the administrative process for validating personnel qualifications and providing authorization to perform specific functions. For purposes of the REP Program Credentialing Framework, it is a system that defines levels of proficiency for individuals participating in REP Program exercise evaluations and plan reviews. Credentialing ensures that individuals are qualified and experienced in performing their roles and responsibilities. It assesses whether an individual meets the training and experience required to perform tasks within a proficiency level.

The Credentialing Framework enables the REP Program to consistently manage current and prospective REP Program evaluators and plan reviewers. The Framework ensures they meet specific requirements and possess the knowledge, skills, and abilities needed to successfully evaluate an exercise or review a plan. Credentialing does not provide a certification, license, or badge. However, it will provide:

- A framework for individuals to become qualified in serving at various proficiency levels for evaluating exercises and reviewing plans;
- A reference to accurately identify training gaps and needs of REP evaluators and plan reviewers; and
- A uniform system of processes and tools to assess the evaluator/plan reviewer's development.

The three major components of the Credentialing Framework are training, practicum, which is a practical application of skills involving evaluator on-the-job training (OJT) and plan reviewer mentorship, and experience. The proficiency levels link these three components together.

An individual will be designated one of four possible levels depending upon the qualifications met and the proficiency demonstrated: Trainee, Type III, Type II, and Type I (increasing, respectively, in proficiency). An individual will initially enter as a Trainee pursuing one or both of the functional areas, Emergency Operations and Technical Operations. Contingent upon successful completion of training, an individual will be assigned a higher proficiency level commensurate with experience and qualifications. In order to advance to a subsequent level, individuals must meet all requirements of their current proficiency level for evaluator or plan reviewer track.

M. USE OF STATE, LOCAL, AND TRIBAL PERSONNEL AS REP EXERCISE EVALUATORS

1. Administrative Process

Training Requirement: State, local, and Tribal personnel must successfully complete the training/experience required of all FEMA evaluators.

Application Packet: Applicants complete and submit their qualification packets to the RAC Chair, which must include the following materials:

- Résumé describing actual REP-related experience and/or equivalent experience;
- Evidence of completion of FEMA credentialing program;
- Two reference letters addressing the evaluator's ability to be impartial, suitability, and qualifications (applicants must be high school graduates, or equivalent [college is recommended]); and
- Commitment signed by the applicant's employer.

Application Review: The RAC Chair reviews the application and determines whether to approve it. Selected candidates are assigned to their respective Home of Record FEMA Region for incorporation into that Regions' roster. State, local, and Tribal personnel may not evaluate within their State (Home of Record); county personnel may not evaluate within their State (Home of Record) or within the EPZ for their site. The accepting RAC Chair is responsible for communications with the assigned evaluator, and will send to each applicant a selection/non-selection letter.

National Registry: FEMA Headquarters maintains a national registry of available qualified ORO evaluators.

2. Host Region Responsibilities

The FEMA Host Region will:

- Request evaluator(s) for upcoming exercise;
- Match training/educational skills to the assignment;
- Complete an informal proximity and travel cost/benefit analysis;
- Budget and pay for invitational travel expenses, including transportation and per diem;
- Select, assign, and approve or disapprove evaluator candidates; and
- Send invitational travel letter to prospective evaluators.

3. Evaluator Responsibilities

The evaluator will:

- Evaluate at least one exercise per year, to remain active;
- Review all exercise material;
- Participate in all required exercise meetings;
- Prepare all written exercise evaluator documentation; and
- Ensure time flexibility in participating as an evaluator (may require weekend duty).

4. Evaluator Employer Commitment

The evaluator's employer will facilitate employee attendance at all required evaluator training, meetings, etc., and agree, in writing, to the conditions stated below.

5. Conditions

ORO REP exercise evaluators are not eligible to receive any compensation, workmen's or other; health insurance; life insurance; annual or sick leave; Federal monetary awards; or any other benefits from FEMA. Evaluator performance does not count toward career tenure or time in service to the Federal government.

N. TRIBAL POLICIES AND PROCEDURES

1. Federally Recognized Tribal Nations and the REP Program

In support of the Presidential policy memorandum issued April 29, 1994, Federally-recognized Tribal Nations must be part of all Federal programs. Pursuant to this Presidential policy, the FEMA Tribal Policy was signed into effect on June 29, 2010.

2. Policy

FEMA recognizes that the Tribal right of self-government flows from the inherent sovereignty of American Indian and Alaska Native Tribes as nations and that Federally-recognized Tribes have a unique and direct relationship with the Federal government. Native American and Alaska Native Tribal governments are not political subdivisions of States, but are recognized by the United States as distinct sovereign entities. FEMA recognizes that, as a sovereign government, each Tribal government sets its own priorities and goals for the welfare of its membership.

FEMA acknowledges the trust responsibility of the Federal Government to American Indian and Alaska Native Tribal governments as established by specific treaties, court decisions, statues, executive orders, regulations, and policies. In recognition of this trust responsibility, FEMA will evaluate the impact of policies, programs, and activities on Tribal trust resources and consider the rights and concerns of Tribal government in its decision-making. FEMA will encourage cooperation and partnership between and among Federal, Tribal, State, local governments, and public and private entities. Effective homeland security and emergency management require the cooperation, partnership, and mutual consideration of neighboring governments.

One Tribal Nation, the Prairie Island Nation, is located within the 10-mile EPZ of an NPP. In addition, many Tribal Nations are located within the 50-mile ingestion pathway EPZ of an NPP. Each Region, except for Region III, has an identified Tribal Liaison. At this time, Region III is the only FEMA Region without any Federally-recognized tribes.

Additional information can be found on FEMA's Tribal website (www.fema.gov/tribal). Among the many items on the site is the complete FEMA Tribal Policy, letters in support of Tribal sovereignty, as well as training information for Tribal governments.

O. STAFF ASSISTANCE VISITS (SAVS)

The purpose of an SAV is to provide assistance to OROs. The SAV may also be used to support demonstration/evaluation of certain Demonstration Criteria as shown in Exhibit III-2, *Federal Evaluation Process Matrix*.

An SAV is coordinated with the affected OROs. The visits may be initiated by the FEMA Regional Office or requested by the OROs.

The purposes of the SAV may include, but are not limited to:

- Providing technical assistance to OROs regarding their plans/procedures or their implementation.
- Supporting development or completion of State requests for plan/procedure approval under 44 CFR Part 350.
- Attending meetings with OROs and the licensee. These meetings are initiated by either the State or licensee, and FEMA is invited to attend.
- Participating in ORO emergency training.
- Attending and participating in exercises and drills to provide support and/or exchange ideas and suggestions.
- Assisting emergency responders with the development and submission of applications for credit for responses to actual emergencies.
- Verifying statements and documentation provided in the ALC and ORO plans/procedures, including:
  - Equipment and supplies for emergency workers;
  - Supply and operability of monitoring equipment;
  - Dosimetry supplies, operation, and maintenance performed according to manufacturer recommendations;
  - Assuring KI supply and its currency for both emergency workers and, if State policy, the general public; and
  - Reviewing training records related to the REP Program.
- Meeting with Tribal Nations located in either the plume and/or ingestion exposure pathway EPZs.

P. EVACUATION TIME ESTIMATES

Evacuation Time Estimates (ETEs) are required within the plume exposure pathway EPZ by NUREG-0654/FEMA-REP-1 under Planning Standard J: Protective Response (Evaluation Criterion J.10.m) and Appendix 4: Evacuation Time Estimates. Please note they are not required for the ingestion EPZ.

NUREG-0654/FEMA-REP-1 requires the licensee to prepare the ETEs and the State to include the information in its plans/procedures, but FEMA does not review or approve ETEs. Instead, FEMA reviews ORO plans/procedures to see whether they include the latest ETE information from the licensee.

NRC provides guidance to licensees in the document NUREG/CR7002, *Criteria for Development of Evacuation Time Estimate Studies*. This guidance requires that ETEs be updated following each decennial census. In addition, an ETE update must be performed if at any time during the 10-year period the EPZ permanent resident population estimate increases such that it causes the longest ETE value for the 2-mile zone or 5-mile zone, including affected emergency response planning areas, or for the entire 10-mile EPZ to change by 25 percent or 30 minutes, whichever is less, from the licensee's currently approved ETE.

Q. POTASSIUM IODIDE FOR THE PUBLIC

Federal Register, Volume 66, No. 13, pp. 5427-5440, *Consideration of Potassium Iodide in Emergency Plans, Final Rule*, Nuclear Regulatory Commission, January 19, 2001

Federal Register, Volume 67, No. 7, pp. 1335-1357, *Federal Policy on Use of Potassium Iodide (KI)*, Federal Emergency Management Agency, January 10, 2002

Guidance for Federal Agencies and State and Local Governments Potassium Iodide Tablets Shelf Life Extension, Food and Drug Administration, March 2004

FEMA's REP Program Guidance to State and Local Governments for Shelf-Life Extension of Potassium Iodide (KI), April 12, 2007

Planning Requirements: In 2001, the NRC revised emergency planning regulations in 10 CFR § 50.47 to require that planners consider including KI as a protective measure for the general public to supplement sheltering and evacuation. The NRC also agreed to fund State, and, in some cases, local KI stockpiles. State and governments are responsible for all other funding connected with the incorporation of KI, such as preparing guidelines for its stockpiling, maintenance, distribution and use, and any other ancillary costs.

Federal Policy on the Use of KI: The FRPCC revised Federal policy regarding the use of KI as a thyroidal blocking agent by emergency workers, institutionalized persons and the general public in the vicinity of nuclear power plants. The Federal position is that KI should be stockpiled and distributed to emergency workers and institutionalized persons for radiological emergencies at a nuclear power plant and its use should be considered for the general public within the 10-mile EPZ of a nuclear power plant. However, the decision on whether to use KI for the general public is left to the discretion of States and, in some cases, local governments.

KI Shelf Life: FEMA issued a policy paper in 2007 providing guidelines for OROs to use in determining whether the expiration date of stored KI may be extended. Procedures for implementing and documenting the extension are also included. The policy paper incorporates the guidance contained in the Food and Drug Administration's letter to the NRC, dated February 15, 2007, which details how KI tablets' shelf life may be extended in 2-year increments under certain conditions. It also incorporates the guidance contained in the FDA Center for Drug Evaluation and Research paper *Guidance for Federal Agencies and State and Local Governments, Potassium Iodide Tablets, Shelf Life Extension*, dated March 2004, which details the laboratory testing necessary to ensure continued stability of the KI.

How to Obtain KI: States interested in obtaining a supply of KI for distribution to the public should send a request letter to Director, Division of Preparedness and Response, Office of Nuclear Security and Incident Response, US NRC, Washington, DC 20555.

R. CONDUCTING PLAN REVIEWS

1. Radiological Emergency Preparedness Plans/Procedures

REP plans/procedures describe what a given jurisdiction will do in case of a radiological emergency. The plans/procedures are part of an organization's emergency operations plan for all types of hazards and may be documented as a hazard-specific appendix to the emergency operations plan as recommended in FEMA's Comprehensive Preparedness Guide 101. Most of the plan/procedure is devoted to describing the emergency response activities and functions that must be performed and designating the OROs that perform them. Most plans/procedures describe emergency functions at three levels of detail:

- A "concept of operations" section gives an overview of the entire jurisdiction's response organization and briefly describes the main functions of each agency.
- Agency-specific chapters give more detailed descriptions of agency roles and responsibilities.
- Step-by-step procedures outline the tasks to be performed by particular response staff, and are incorporated into the plan or attached as separate volumes. For example, the Health Department may have a specific procedure for its EOC representative, outlining which Health Department resources to activate at particular ECLs. Health Department staff

members assigned to radiological monitoring may have their own procedures that outline equipment checks, monitoring procedures, reporting protocols, etc.

A REP Plan also generally describes how the jurisdiction's response efforts relate to the efforts of other jurisdictions and organizations, such as the licensee, neighboring OROs, and the Federal Government.

In addition to describing emergency roles, plans/procedures contain policies and procedures for routine administration of the preparedness program. For example, the REP plans/procedures are required to cite the statutory authority and responsibilities of public officials with respect to emergency management, describe the jurisdiction's preparedness training and exercise program, and assign responsibilities and procedures for maintaining equipment and updating the plans/procedures.

A REP plan is generally prepared by a State, county, local, or Tribal jurisdiction. In some cases, a specific agency or institution, such as a school district, hospital, university, or correctional facility, will have its own plans/procedures. Preparation of these plans/procedures is coordinated with the plans/procedures of the jurisdiction in which the institution is located. Such plans/procedures usually cover only a subset of functions within an organization's all-hazards emergency operations plan. However, they are reviewed because they may be the primary documents that guide efforts to protect particular parts of the population. In addition, portions of a REP plan may also consist of separate documentation (e.g., detailed training plans, public information/affairs procedures) that supports the plan's core components (i.e., concept of operations, agency-specific chapters, and step-by-step procedures, as mentioned above). This supporting documentation is reviewed to verify the adequacy of planning to satisfy various criteria of the NUREG-0654/FEMA-REP-1 Planning Standards and other REP guidance.

The term "plans/procedures" as used in this manual includes radiological emergency preparedness/response plans/procedures, associated implementing procedures such as Standard Operating Guides, and other supporting and referenced materials, all of which are subject to review. The generic term "plans/procedures" is used specifically to allow flexibility. Procedures may be either incorporated in the main plans or into separate procedural documents at the discretion of the ORO.

2. Division of Functions and Applicability of Criteria

NUREG-0654/FEMA-REP-1 contains the Planning Standards and Evaluation Criteria adopted by the NRC and FEMA for evaluating REP plans/procedures and preparedness. Licensees and OROs generally work together to ensure that all emergency response functions and capabilities described in NUREG-0654/FEMA-REP-1 are available. However, the specific allocation of functions among jurisdictions may vary from site to site. Some functions described in NUREG-0654/FEMA-REP-1 may be primarily (or solely) State responsibilities; some may be local responsibilities; and others may be both.

When evaluating a REP plan, the reviewer must be aware of the functions for which the jurisdiction is responsible. Generally, these functions are described in the concept of operations section of the plans/procedures. In some cases, it may be necessary for the reviewer to examine other related plans/procedures to determine how responsibilities are allocated among jurisdictions. For example, when reviewing ORO plans/procedures, it may be necessary to examine the corresponding State plans/procedures to fully understand the breakdown of responsibilities between the State and the local jurisdictions. Although the applicability of each Evaluation Criterion to Tribal plans/procedures are not specified, generally most criteria applicable to local government plans/procedures (and perhaps some applicable to State plans/procedures) will also be applicable to Tribal plans/procedures. Once again, the reviewer must be aware of the overall concept for offsite emergency response and the functions for which the jurisdiction is responsible.

Plan reviews are conducted as shown in Exhibit IV-7.

Exhibit IV-7: Plan Review Responsibility

Plan Review Activity	Responsible Agency
Application for formal FEMA 44 CFR Part 350 approval	FEMA
Combined Operating License (COL) Applications	FEMA
Early Site Permit (ESP) Applications	FEMA
Prior to submittal of the ALC to FEMA. An ALC is required regardless of whether or not changes to plans/procedures have been made.	State
Changes resulting from annual or periodic reviews by OROs, exercises, and/or lessons learned from disasters	State FEMA

A REP plan review is normally conducted by evaluating the plans/procedures against the entire set of NUREG-0654/FEMA-REP-1 Evaluation Criteria. A cross-reference between the corresponding Evaluation Criterion/Criteria must be provided when plans/procedures are submitted for review to aid the reviewer in locating information. However, because allocation of functions varies among jurisdictions, given plans/procedures usually address most, but not all, functions described in NUREG-0654/FEMA-REP-1. If a particular function is not addressed in the REP plan, the plans/procedures reference the document in which it is addressed. For example, local plans/procedures may stipulate that the licensee and State conduct radiological monitoring and dose assessments. A reviewer must cross-check plans/procedures, if necessary, to make sure that each point is covered somewhere and the pertinent references have been clearly stated in both places.

The result of the reviewer's evaluation is expressed as one of the following for each NUREG-0654/FEMA-REP-1 Evaluation Criterion:

- **Adequate:** Contents of the REP plans/procedures are consistent and in full compliance with the requirements delineated in the stated Evaluation Criterion.
- **Adequate – Corrections Must Be Made:** Contents of the REP plans/procedures are adequate, but before a determination can be made as to whether they can be implemented, corrections must be made to the plans/procedures or supporting measures must be demonstrated (e.g., adequacy and maintenance of procedures, training, resources, staffing levels and qualifications, and equipment).
- **Inadequate:** Contents of the REP plans/procedures do not satisfy the Evaluation Criterion.
- **Not Applicable:** Evaluation Criterion does not apply to the REP plans/procedures being reviewed. For example, some Evaluation Criteria may be applicable to State REP plans/procedures but may not apply to local plans/procedures.

3. Format for Plan Reviews

A partial sample of the general format used by FEMA to document REP Plan reviews is shown in Exhibit IV-8. Planning Standards and Evaluation Criteria applicable only to utilities are not listed in the plan review format since they do not apply to reviews of ORO plans/procedures.

For each Evaluation Criterion applicable to the plans/procedures under review, the reviewer enters the appropriate rating (Adequate, Adequate – Corrections Must Be Made, or Inadequate) based on the reviewer's statement. The reviewer lists specific recommended changes to correct any rating of "Adequate – Corrections Must be Made," or "Inadequate." Typographical and other minor errors noted are also listed for correction, even if the rating is "Adequate."

Exhibit IV-8: Plan Review Format

	Planning Standard	Adequate	Adequate - Corrections must be made	Inadequate	Not Applicable	Comments
A	ASSIGNMENT OF RESPONSIBILITY					
A.1.a	Each plan shall identify the State/Tribal, local, federal and private organizations that are intended to be part of the overall response organization for EPZ.					*Licensee, State/Tribal, and local requirement.*
	Describe all Federal, State/Tribal, local and private-sector organizations comprising the overall ORO.					
	Identify the principal response organizations.					
A.1.b	Each organization and sub organization having an operational role shall specify its concept of operations and its relationship to the total effort.					*Licensee, State/Tribal, and local requirement.*
	Specify the organization's role in an emergency.					
	Specify how the organization will carry out its role in an emergency.					
A.1.c	Each plan shall illustrate these interrelationships in a block diagram.					*Licensee, State/Tribal, and local requirement.*
	Include an illustration of each organization and its relationship to the total emergency response effort.					
A.1.d	Each organization shall identify a specific individual by title who shall be in charge of the emergency response.					*Licensee, State/Tribal, and local requirement.*
	Identify a specific individual, by title/position, who is in charge of the emergency response.					
	Specify who, by title/position, coordinates response activities under the authority of the person in charge.					
A.1.e	Each organization shall provide for 24-hour per day emergency response, including 24-hour per day manning of communications links.					*Licensee, State/Tribal, and local requirement.*
	Specify who, by title/position, is responsible for managing the communications center.					
	Describe the procedures to provide for 24-hour emergency response.					
	Specify where the 24-hour communications center is located.					

S. CONDUCTING SCENARIO REVIEWS

1. Scenario Review Preparation

Outlined below is the sequential process to be used in evaluating the technical efficacy of proposed scenarios for FEMA REP biennial exercises. The times listed below are the estimated number of hours to complete the requirements of each step.

Exhibit IV-9: Scenario Review Process

STEP 1	Conduct an inventory and very rudimentary review of the REP Exercise Scenario package provided. Use the *REP Exercise Scenario Review Checklist* to ensure that all documentation necessary to perform the scenario review is present. (2 Hours)
STEP 2	Conduct comprehensive technical review of REP exercise scenario package to determine whether or not the scope, characteristics, and content of the scenario are adequate to drive the necessary demonstration of the selected Demonstration Criteria by the offsite jurisdictions for a plume and/or ingestion exposure pathway exercise. This step will include: ▪ Review of the scope of the scenario to ensure that: · All impacted jurisdictions are included; · Map(s) of the plume and/or ingestion EPZ is included; · Expected offsite actions are consistent with the Extent-of-Play Agreements. ▪ Review of the proposed accident scenario to determine: · Type of threat (potential plant conditions-versus-simulated radiological release; · Radiological release characteristics (radionuclide mixture), if appropriate; · Degree of risk to the public (U.S. Environmental Protection Agency (EPA) Protective Action Guides (PAG) or State equivalent to be exceeded and to what degree); · Meteorological conditions (including wind and weather); · Technical adequacy of the scenario's offsite data to support technical controller injects. ▪ Review of the controller injects' content (technical) to determine: · Technical adequacy to drive the various components of offsite plume and ingestion exposure pathway exercise play (exposure rates, air concentrations, dosimeter readings, surface contamination levels, food and water contamination levels, data gradients, etc.). (10 Hours Plume) (16 Hours Ingestion)
STEP 3	Perform the necessary calculations, modeling, or other evaluations to determine whether the potential plant conditions, simulated radiological release, or controller injects will result in a sufficient dose, exposure rate, or concentrations to drive the appropriate decisions and actions by offsite officials necessary to demonstrate the agreed upon Demonstration Criteria in the jurisdictions to be exercised. Verify the area affected by the plume or deposition footprint. (2 Hours – Plume) (2 Hours – Ingestion)

STEP 4	Analyze the time sequences and intervals between planned exercise events. Ensure that adequate time has been allowed for the appropriate offsite response organizations to demonstrate the selected Demonstration Criteria (technically) sufficiently. (2 Hours)
STEP 5	Discuss the preliminary results of the scenario review with the RAC Chair or designee in the FEMA Region(s). Identify and offer recommendations for resolving any recognized or potential scenario problems. If no problem areas are identified, proceed to Step 7. Otherwise, prepare a brief summary of the results of the recognized scenario problems in writing to the FEMA Region(s) RAC Chair. (4 Hours – more may needed if more than one FEMA Region is involved)
STEP 6	Assist and support the FEMA Region(s) RAC Chair in negotiating scenario changes with the State(s) and/or licensee, as requested. (4 Hours)
STEP 7	Review all exercise scenario revisions received. Document the results of the scenario review and related findings in writing to the FEMA Region(s) RAC Chair and provide a copy to the Radiological Emergency Preparedness Section, FEMA Headquarters. Retain a detailed record of the scenario review with the contractor's files. (6 Hours)

2. Radiological Emergency Preparedness Exercise Scenario Review Checklist

The following information is provided to the scenario review contractor to facilitate the conduct of a comprehensive technical review of the submitted REP exercise scenario. The data listed below are not intended to include all of the data that are needed for the scenario. The FEMA Region(s) RAC Chair makes appropriate arrangements assuring that the information listed is provided to the contractor.

FACILITY:_____

CHECK IF INCLUDED

I. PRE-EXERCISE AGREEMENTS AND EXERCISE BACKGROUND MATERIALS

_____ 1.* Assessment Areas to be demonstrated by designated State and local jurisdictions

_____ 2.* Pre-exercise agreements, including extent of play by Assessment Area

_____ 3.* Previous exercise evaluation report and related information on any technical issues

_____ 4.* Radiological portions (e.g., emergency worker exposure limits, PAGs, air sampling procedures, dose calculation procedures, etc.) of the most recent version of the State, local, and appropriate agency plans/procedures, including detailed and readable maps showing pre-selected reference points.

_____ 5.* NUREG-0654/FEMA-REP-1 cross-reference index to the State, local, and appropriate agency plans/procedures

* Indicates those items that FEMA Region(s) are responsible for providing to the scenario review contractor.

II. SCENARIO INFORMATION – GENERAL

_____ 1. Utility/State/local scenario timelines

_____ 2. All controller injects and messages with data in appropriate units, including those triggering the demonstration of specific technical objectives (any additional data or information needs will be identified during the detailed technical review)

III. SCENARIO INFORMATION – RELEASE PARAMETERS

_____ 1. Potential-Only or Simulated Release

_____ 2. Either gross noble gas, gross radioiodine, and gross particulate release rate, or isotopic release rates. If gross release rates are given, the accident type must be stated. Isotopic release rates are required for post-plume phase activities.

_____ 3. Site characteristics and topography assumed to affect the dispersion

_____ 4. Release point information (height – elevation ground, or mixed; etc.)

_____ 5. Time of reactor shutdown

_____ 6. Start time and duration of release

_____ 7. Meteorological data used

_____ 8. Atmospheric mixing depth (if not provided, 1250 meters will be used)

_____ 9. Whether decay is, or is not, included in the calculations

IV. SCENARIO INFORMATION – PLUME PHASE DATA

_____ 1. Centerline and isopleths of atmospheric dilution factors (X/Q) plotted on a map, including date and times of data values

_____ 2. Direct radiation readings and locations

_____ 3. Environmental samples – descriptions, locations, date, times, and results in appropriate units related to offsite instruments and procedures

_____ 4. Radioiodine and particulate calculation results in appropriate units related to offsite instruments and procedures

_____ 5. Map(s) that are readable and detailed for the plume phase data with plume location plotted at selected time periods

_____ 6. Estimated doses and exposure rates calculated along the plume centerline. If different models are used by the State and utility, included data for both

V. SCENARIO INFORMATION – INGESTION/RELOCATION PHASE DATA (See Section I., Item Number 1.)

_____ 1. Centerline and isopleths of dilution factions X/Q plotted on a map, including date and times of data values

_____ 2. Direct radiation readings and locations

_____ 3. Environmental samples – descriptions, locations, date, times, and results in appropriate units related to offsite instrument and procedures

_____ 4. Map(s) that are readable and detailed for the ingestion/relocation phase data with the deposition footprint locations indicated at selected time periods and results in appropriate units related to offsite instruments and procedures

_____ 5. Estimated doses calculated along the plume centerline for the ingestion/relocation Phase

_____ 6. Any planned inconsistencies between plume and ingestion/relocation data

Certification

The scenario information and data provided by the FEMA Region(s) RAC Chair and items checked on this form have been provided.

_____	_____	_____
Name	Company	Date

T. ANNUAL LETTER OF CERTIFICATION (ALC)

1. Guidance

To facilitate monitoring of REP planning and preparedness requirements as prescribed in NUREG-0654/FEMA-REP-1 and 44 CFR Part 350, each State that has a REP program submits an ALC to the appropriate FEMA Regional Administrator. The ALC assists FEMA in making reasonable assurance findings and determinations regarding offsite radiological emergency plans/procedures and preparedness. Each November, the FEMA Regional Office submits a letter to the State requesting the ALC. The ALC submission for a given year is required by January 31 of the following year. The ALC may address more than one site within the State.

By the end of February, FEMA Regional personnel review the ALC and mail to the State either an approval letter for each site or a letter requesting additional information for completing the review. FEMA personnel may verify information during SAVs. FEMA Regional personnel will provide FEMA Headquarters with a copy of the State's ALC cover letter and the Region's final approval letter.

The following review guide assists State and FEMA Regional personnel with development, submission, and review of the ALCs and development of public education and information materials. Each element of the guide is supported by the appropriate regulation and/or guidance. Regional personnel may send the review guide to their respective states as attachments to the November letter requesting the ALC. A sample transmission letter is included at the end of this section.

The ALC must include assurances that all requisite activities have been undertaken or completed, as appropriate, by OROs. At a minimum, documentation of the items listed below must be included in, or attached to, the ALC.

- 24-Hour Staffing (Planning Standard A): Certification that the ORO has sufficient trained and capable staff to maintain a 24-hour capability for protracted activation.
- Public Education and Information (Planning Standard G): Means used to disseminate information, dates conducted, participants, sponsoring organizations, and identification and description of any programs conducted to increase public and media radiological emergency planning and response awareness.
- Emergency Facilities and Equipment (Planning Standard H): List of equipment/instrument types, quantity, and dates of check/test.
- Exercises (Planning Standard N): Testing of all major elements, in an exercise or by other means as appropriate, and testing plans/procedures for implementing ingestion pathway and post emergency measures. (FEMA-evaluated exercises are documented in AARs; only non-evaluated exercises need to be reported in the ALC.)
- Drills (Planning Standard N): Types, dates held, and participating organizations (FEMA-evaluated drills are accounted for in AARs; only non-evaluated drills need to be reported in the ALC.)
- Radiological Emergency Response Training (Planning Standard O): Scope and purpose of training, dates held, number of participants, agencies represented, and sponsors of training.
- Update of plans/procedures and Letters of Agreement (Planning Standard P): Verification that plans/procedures and letters of agreement have been reviewed and appropriate changes made. Updates of plans/procedures include telephone numbers, call-down lists, ingestion pathway information, and maps.
- Alert and Notification (NUREG-0654/FEMA-REP-1, Appendix 3): Types of tests conducted in accordance with established schedule, dates held, and operability percentage achieved based on periodic testing.

2. Sample Annual Letter of Certification Cover Letter

SAMPLE COVER LETTER FOR ANNUAL LETTER OF CERTIFICATION AND PUBLIC EDUCATION AND INFORMATION[98] REVIEW GUIDES

(Date)

State Director/Administrator
Emergency Management Division
Location
Street
City, State, Zip Code

Dear Ms./Mr. (Name):

The Annual Letter of Certification (ALC) assists the Federal Emergency Management Agency (FEMA) in making reasonable assurance findings and determinations regarding offsite radiological emergency plans/procedures and preparedness. Enclosed is a review guide for use by your staff when developing your site-specific certifications.

Also enclosed for your use is the public education and information materials review guide. Our staff will use this guide to review public education and information materials submitted with the ALC.

The ALC is due in this office no later than January 31, (year). If you have any questions concerning the review guides or the ALC submission, please contact (name of site specialist) at (phone number).

Sincerely,

Regional Assistance Committee Chair
FEMA Region (number)

Enclosures: ALC Review Guide
Public Education and Information Review Guide

[98] The Public Education and Information Review Guide is found in the next section.

3. Annual Letter of Certification (ALC) Review Guide

Department of Homeland Security
Federal Emergency Management Agency
Radiological Emergency Preparedness Program

ANNUAL LETTER OF CERTIFICATION REVIEW GUIDE
(Date)

Purpose:

To provide guidance for review and evaluation of the Annual Letter of Certification (ALC) submitted by the States for compliance with periodic requirements.

Scope:	Requirement:
The State ALC is reviewed to determine whether all information/documentation is included pursuant to laws and regulations and the Federal Emergency Management Agency (FEMA) Radiological Emergency Preparedness (REP) Program Manual. Information contained in the ALC is compared with the offsite response organizations (ORO) plans/procedures and the Alert and Notification System (ANS) design reports for consistency and accuracy.	✓ 44 CFR part 350 ✓ NUREG0654/FEMA-REP-1 Planning Standard A. 24-Hour Staffing Capability G. Public Education and Information H. Emergency Facilities and Equipment N. Exercises and Drills O. Radiological Emergency Response Training P. Responsibility for the Planning Effort ✓ FEMA-REP10 ✓ FEMA REP Program Manual

Confirm that the ALC includes the following items:

Update of Plans/Procedures and Letters of Agreement

1. A statement that ORO plans/procedures and Letters of Agreement (LOAs) have been reviewed for accuracy and completeness of information, and appropriate changes made. Updated LOAs and plan/procedure amendments must be submitted if not received previously.

	Yes	No	N/A

Public Education and Information

1. A statement that annual dissemination of information to the public was performed, and that the information includes how the public will be notified and what their actions should be in an emergency. This may be accomplished by, but not necessarily limited to, annual publications, periodic information in utility bills, and information in telephone books. (NUREG-0654/FEMA-REP-1, Evaluation Criteria G.1 and G.2)

This statement must include the:	Yes	No	N/A
a. Dates of dissemination			
b. Means of dissemination			
c. Identification of recipients			
d. Copies of all public information materials			

2. A statement that emergency information was disseminated to locations frequented by transient populations in the emergency planning zone (EPZ), including (if applicable) hotels, motels, gas stations, phone booths, parks, marinas, boats, and other recreational areas. This may be accomplished by, but need not be limited to, decals, posters, or brochures/pamphlets. (NUREG-0654/FEMA-REP-1, Evaluation Criteria G.1 and G.2)			
This statement must include:	Yes	No	N/A
a. Dates of dissemination			
b. Means of dissemination			
c. Identification of locations where information was distributed or posted			
d. Copies of all public information materials			
e. Organizations responsible for distribution			
3. A statement (if applicable) that yearly maintenance and updates on emergency public information signs located along rivers, parks, and other recreational areas were performed. (NUREG0654/FEMA-REP-1, Evaluation Criteria G.1 and G.2)			
This statement also:	Yes	No	N/A
a. Certifies that parks and other recreational areas were not expanded, nor were new transient areas added to the plume EPZ. If expansions or additions were made, a statement must be provided that the appropriate additional signs were installed.			
b. Identifies organizations responsible for maintenance/ updates			
4. A statement that emergency public information materials for the ingestion pathway were updated and distributed. (NUREG-0654/FEMA-REP-1, Evaluation Criteria G.1 and G.2)			
This statement must include:	Yes	No	N/A
a. Means of dissemination			
b. Copies of public information materials			
5. A statement that annual media program was conducted to acquaint news media with emergency plans/procedures, information concerning radiation, and points of contact for release of public information in emergency. (NUREG-0654/FEMA-REP-1, Evaluation Criterion G.5)			
This statement must include:	Yes	No	N/A
a. Date(s) held			
b. Agencies/organizations invited/ participated			
c. Organizations that sponsored program			
d. Description of program			
NOTE: In instances of poor attendance, in lieu of a meeting, a statement that program materials covering requisite topics were mailed to media representatives must be provided.			

Radiological Emergency Response Training			
1. A statement that initial training and annual retraining of personnel who implement radiological emergency response plans/procedures have been accomplished. (NUREG-0654/FEMA-REP-1, Evaluation Criterion O.5)			
Statement must include the following for all training conducted:	Yes	No	N/A
a. All required organizations were offered training pursuant to ORO plans/procedures			
b. Scope and purpose			
c. Dates training were held			
d. Number of participants			
e. Agencies/organizations represented			
f. Agencies/organizations invited, but who did not attend.			
g. Organizations that sponsored the training.			
Drills **NOTE:** These drills shall not be part of a regularly scheduled exercise (NUREG-0654/FEMA-REP-1, Evaluation Criterion N.2), with exception of the annual medical drill. Only non-evaluated drills need to be reported in the ALC.			
1. A statement that communication drills (NUREG-0654/FEMA-REP-1, Evaluation Criterion N.2.a) were conducted:			
	Yes	No	N/A
a. Monthly between the State and OROs within plume EPZ			
b. Quarterly between State and Federal emergency response organizations and states within ingestion pathway EPZ			
c. Annually between NPP, State, and local emergency operations centers, and radiological field monitoring teams			
d. Dates of communication drills and participating organizations			
2. A statement that radiological monitoring drills related to plume collection of particulate and radioiodine samples and radiation measurements and if applicable any Ingestion Pathway drills that were performed during the period of this ALC. (NUREG-0654/FEMA-REP-1, Evaluation Criterion N.2.d)			
This statement must include:	Yes	No	N/A
a. Dates of monitoring drills			
b. Organizations that participated			
NOTE: These drills must involve personnel and resources for field team coordination and field teams.			

3. A statement that health physics drills were conducted semiannually with licensees that included response to, and analyses of, simulated elevated airborne and liquid samples and direct radiation measurements in environment. Where a State is responsible for more than one site, the State portion of drills need not be done at each site. (NUREG-0654/FEMA-REP-1, Evaluation Criterion N.2.e)			
This statement must include:	Yes	No	N/A
a. Dates of health physics drills			
b. Organizations that participated			
NOTE: Health physics drills must involve personnel and resources for dose assessment.			
24-Hour Staffing (NUREG-0654/FEMA-REP-1, Evaluation Criterion A.1.e)			
1. A statement that sufficient trained and capable staff is available to maintain 24-hour capability for protracted activation.			
	Yes	No	N/A
Emergency Facilities and Equipment (NUREG-0654/FEMA-REP-1, Evaluation Criteria H.3; G.3.a; J.10.h; J.12; K.5.b)			
1. Identification of facilities that are new or have had substantial changes in structure or mission since initial evaluation. A substantial change is one that has a direct affect or impact on the emergency response operations performed in those facilities.			
This statement must include:	Yes	No	N/A
a. Verification that the facility has been evaluated, or the expected date of the evaluation			
2. Certification that no substantial changes in structure or mission of previously reported facilities have occurred since initial evaluation.			
This statement must affirm that:	Yes	No	N/A
a. There are no other new emergency response facilities, communications systems, or congregate care facilities			
b. None of the other current facilities, communications systems, or congregate care facilities in the plans/procedures has undergone substantial changes			
3. A statement that inspection, inventory, and operational checks were made of survey instruments used for radiological monitoring (evacuee and emergency worker) and environmental monitoring and analysis (radiological field monitoring teams and radiological laboratory) at least once each calendar quarter and upon each use. (NUREG-0654/FEMA-REP-1, Evaluation Criterion H.10)			
This statement must include:	Yes	No	N/A
a. Type of equipment			
b. Quantity of equipment			
c. Location of equipment			
d. Calibration frequency			
e. Dates of inspection/inventory check			

4. A statement that survey instruments used for measuring radiation during environmental monitoring and analysis (field teams and radiological laboratories) were calibrated at intervals recommended by supplier of equipment (NUREG-0654/FEMA-REP-1, Evaluation Criterion H.10)			
If calibration occurred, the statement must include:	Yes	No	N/A
a. Type of equipment			
b. Quantity of equipment			
c. Location of equipment			
d. Dates of calibration			
5. A statement that direct-reading dosimetry has been tested for accuracy. All Direct-Reading Dosimeters (DRDs) shall be inspected for electrical leakage at least annually. CDV-138s must be inspected for electrical leakage quarterly. Dosimeters shall be recharged or replaced as necessary. (NUREG-0654/FEMA-REP-1, Evaluation Criterion H.10)			
This statement must include:	Yes	No	N/A
a. Type of equipment			
b. Quantity of equipment			
c. Location of equipment			
d. Dates of calibration			
6. A statement that sufficient quantities of potassium iodide (KI) are available for emergency workers, institutionalized individuals, and if the plan calls for it, the general public. (NUREG-0654/FEMA-REP-1, Evaluation Criterion J.10.e) If quantities of KI were not verified by FEMA during most recent biennial exercise:			
This statement must include:	Yes	No	N/A
a. Amounts of KI available			
b. Storage locations			
c. Expiration date(s)			
Alert and Notification			
1. A statement that a routine siren testing program was completed pursuant to the design report. (REP Program Manual Section V, Part A)			
This statement must include:	Yes	No	N/A
a. Type of tests conducted in accordance with established schedule			
b. Dates of tests			
c. Number of sirens tested operable and inoperable			

2. Analysis of percentage of operable sirens. (REP Program Manual Section V, Part A)			
This must be at least 90 percent and include:	Yes	No	N/A
a. Computation of siren operability (percentage of sirens operable) for the immediately preceding calendar year. This is determined by simple average of all regularly conducted tests employed as part of testing program (e.g., silent, growl, full cycle). Calculations will be checked by specialist to substantiate results.			
b. Description (or calculations) of method used to calculate siren operability percentage			
3. A statement (if applicable) that a maintenance program for residential tone alert radios has been properly implemented. (REP Program Manual Section V, Part A)			
This statement must specify the type and frequency of residential tone alert radio (as part of primary ANS) tests conducted and include assurances that:	Yes	No	N/A
a. Registers, containing list of addresses where equipment is located, have been updated to reflect additions or changes			
b. Registers include individuals who have refused this equipment			
c. Equipment operating checks have been completed or offered to residents with this equipment			
d. Tests identifying frequency were conducted offering the public a means to self-test its receivers			
e. Necessary written guidance was provided that addressed:			
f. General usage			
g. Self-testing frequency and method			
h. Suggested placement to facilitate efficient use			
i. Maintenance program details			
j. Telephone numbers for repair or replacement			
4. A statement specifying type and frequency of routine testing of all applicable alerting systems, other than sirens and tone alert radios. This testing must be performed at least annually. (REP Program Manual Section V, Part A)			
Alerting methods may include:	Yes	No	N/A
a. Mobile route alerting and notification			
b. Aircraft route alerting and notification			
c. Institutional alerting mechanisms in schools, hospitals, nursing homes, etc.			
d. Automatic telephone dialers/switching equipment			
e. Modulated power lines			
f. Type and frequency of residential tone alert radio (as part of primary ANS) tests conducted			

5. A statement (if applicable) that a maintenance program for alerting systems other than sirens and tone alert radios (e.g., radios in schools/hospitals) has been properly implemented. (REP Program Manual Section V, Part A)			
This statement must include assurances that:	Yes	No	N/A
a. Registers, containing list of addresses where equipment is located, have been updated to reflect additions or changes			
b. Registers include organizations that have refused this equipment or information			
c. Equipment operating checks have been completed or offered			
d. Necessary written guidance was provided that addressed:			
e. General usage			
f. Suggested placement to facilitate efficient use			
g. Maintenance program details			
h. Telephone numbers for repair or replacement			
6. A statement (if applicable) for exception areas requiring alert and notification methods, other than sirens and tone alert radios (e.g., aircraft and/or mobile route alerting and notification) that routes, alerting methods, and resources remain unchanged. If changes did occur, design report must be updated to reflect modifications.			
7. A statement that siren sound pressure/population density requirements have been met. (REP Program Manual Section V, Part A)			
This statement must include assurances that:	Yes	No	N/A
a. In areas where siren sound pressure level is less than 60 dBc, population remains below 2,000 persons per square mile			
b. If population has increased to the level of 2000 persons per square mile, siren sound pressure levels must be increased and design report modified			
8. A statement (if applicable) that in areas not covered by sirens, no permanent population has relocated into these areas. In areas of EPZ where no permanent population exists and transients would not frequent, a letter certifying this fact was provided with initial design report. State must certify that this condition remains unchanged; no permanent or transient population has relocated in these areas. If relocation did occur, sirens, tone alert radios, or other means for alerting these individuals would then be required.			

U. PUBLIC INFORMATION GUIDE AND PROCESS

1. Guidance

Purpose: To provide guidance for review and evaluation of public information materials distributed by offsite response organizations (OROs) and licensees for nuclear power plants (NPPs).

Scope: Public information materials are reviewed prior to distribution to determine whether information and emergency instructions have been included and disseminated pursuant to laws and regulations, Federal Emergency Management Agency (FEMA) Headquarters and Regional policy determinations, the Radiological Emergency Preparedness (REP) Program Manual, and the REP series documents.

Emergency information and instructions contained in the public information materials will be compared to ORO plans/procedures for consistency and accuracy. Emergency information material is to be updated and distributed annually. If the updates affect ingestion public information material, then that material must also be updated and reviewed by FEMA.

Basis: 44 CFR § 350.5 (a.7), NUREG-0654/FEMA-REP-1, Revision 1, Evaluation Criteria A.1.e, E.5, E.6, E.7, G.1, G.2, J.9, J.10.a, J.10.c, J.10.d, J.10.h, and J.11.

2. Review Steps

Effective preparedness depends on an ongoing, comprehensive public education effort. Public education increases community awareness about emergency self-protection. Public education efforts go beyond the distribution of materials. The public needs to be familiarized with commercial NPP emergencies and related procedures. Clear public communication of NPP emergency procedures will result in a better public understanding of written emergency materials and instructions. The following items are considered when developing or reviewing emergency public information and educational materials.

Exhibit IV-10: Public Information Review Checklist

Y	N	N/A	
BASIC INFORMATION (requirements)			
			There is a clear statement of purpose.
			The date of issue and name of the issuing agency are clearly indicated.
			Emergency telephone numbers are provided along with instructions on the procedures to be followed and instructions on their use (e.g., transportation assistance, pickup points). “Hotline” telephone numbers for emergencies are separate from information numbers used during non-emergencies.
			Names, addresses, and telephone numbers of the appropriate organizations to contact in non-emergency situations are provided.
			The cover design encourages recipients to open and read the publication.
			Informational and educational materials have clear emergency focus. They explain what to expect and in what sequence, and what actions, in order of priority, are taken.
			The content is consistent with the ORO plans/procedures, public information materials, and emergency alert system (EAS) broadcast messages.
			The cover clearly states that the document contains important emergency instructions.
			Public inquiry numbers are provided.
			General education material, if included, is placed after the emergency procedures information.
			Blank space is provided in the emergency procedures section for personal notes.
			There is a statement on when this information will be updated.
			An emergency planning zone (EPZ) map with landmark descriptions of sub-areas or sub-zones is included.
			Siren test dates (i.e., day of the week and time) are identified.
ORGANIZATION OF MATERIAL (recommendations)			
			The cover has a highly visible statement that identifies the materials as instructions or information for use in an emergency.
			The layout is easy to follow from paragraph to paragraph and page to page. Page and section breaks are consistent with the logic and organization of the materials.
			The information is presented in a logical sequence of topics. The flow of information is smooth and not disjointed.
			Within a given topic, actions to be taken come first, followed by rationale or explanation.
			Key symbols or graphic images are used to help locate and/or understand the text.

Y	N	N/A	
			COMPREHENSION (requirements)
			Vocabulary is simple, comprising non-technical terms likely to be used by the intended audience.
			Sentences are clear and concise.
			The reading level is appropriate based on one of the following: • The entire emergency procedures section has a reading level of grade 9 or below, as characterized by a readability formula such as Dale-Chall; or • The entire emergency procedures section has a reading level equivalent to that of the target audience, as characterized by a readability formula; or • Most of the emergency procedures section of the document has a reading level of grade 9 or below, as characterized by a readability formula. However, a higher level is acceptable since the somewhat longer, more natural sentence structures make use of simple language.
			Typography is easy to read.
			The choice of colors meets the needs of colorblind individuals.
			The format and text size for the emergency information included in the document is appropriate.
			Photographs, maps, charts, tables, and artwork are used effectively to enhance the text and are not distracting.
			The various elements of graphic design work together harmoniously to achieve the desired effect.
			The format encourages retention.
			Color is used to enhance and highlight important details about the emergency information.
			When the public is referred to written materials, this reference can be easily understood.
			Sentences are brief and easy to understand.
			Messages are internally consistent.
			Public education passages, if included, are not distracting.
			PERSONS WITH DISABILITIES AND ACCESS/FUNCTIONAL NEEDS (requirements)
			Provisions that address persons with disabilities and access/functional needs (e.g., hearing/mobility-impaired, transportation-dependent, etc.) are provided.
			The system for addressing needs of persons with disabilities and access/functional needs is identified.
			A method of identifying that those individuals within the EPZ in need of assistance during an evacuation have been provided information (e.g., pre-paid postcard) in such a way that it cannot be lost during shipment or during initial reading of the public information material, etc. Information includes instructions that registration is necessary (e.g., the card is to be returned) if the resident requires special assistance.
			Discusses information as it relates to the care of public and private school children (including preschools and licensed day cares), hospital patients, nursing home residents, persons with disabilities and access/functional needs, persons subject to judicial restraint, and occupants of other special institutions identified in the plan.
			PERSONS WITH DISABILITIES AND ACCESS/FUNCTIONAL NEEDS (recommendations)
			Information is made accessible to transients and visitors through appropriate means.

Y	N	N/A	
			INGESTION PATHWAY INFORMATION (requirements)
			The information explains protective actions provided for all types of agricultural products in the ingestion pathway for the site, including the following:
			• Milk
			• Vegetables and Fruits
			• Meat and Meat Products
			• Poultry
			• Soils
			• Grains
			• Water
			• Other products (e.g., Honey, Fish and Marine Life)
			The effects of radiation and radioactive material deposits on the human food supply are clearly stated.
			INGESTION PATHWAY INFORMATION (recommendations)
			The public information materials explain how the farmers, food processors, and distributors will be notified of an emergency.
			The public information materials explain how the farmers, food processors and distributors will be advised of appropriate actions to take.
			NOTIFICATION PROCEDURES (requirements)
			Information is provided regarding alert and notification procedures.
			Identification of emergency broadcast stations/channels is provided, to include which ones are primary and operate 24 hours per day.
			The public is encouraged to alert neighbors, by means other than the telephone, to ensure they also heard and understood the warning signals.
			Instructions are consistent with the ORO plans/procedures, public information materials, and previous EAS messages.
			Information regarding emergency classification levels is included.
			Transportation provisions are included.
			NOTIFICATION PROCEDURES (recommendations)
			School provisions, including guidelines or instructions for parents, are included.
			Instruction on the care and feeding of livestock during an emergency, if appropriate to the area, is included.
			Public EAS broadcast instructions have a clear emergency focus and explain what to do.
			The emergency instructions are released by a recognized ORO authority.
			The emergency broadcast messages are presented in a foreign language when appropriate.
			Messages inform the public located in areas under protective action decisions and those outside those areas via geographic landmark descriptions.

Y	N	N/A	
			SHELTERING (requirement)
			Sheltering procedures and instructions for the general population, private and public school children (including preschools and licensed day cares), hospital patients, nursing home residents, persons with disabilities and access/functional needs, persons subject to judicial restraint, and occupants of other special institutions as identified in the plans/procedures, are included.
			SHELTERING (recommendation)
			Sheltering is defined according to the ORO plan.
			EVACUATIONS (requirements)
			Evacuation routes are described in the text and illustrated directions on an evacuation map of the EPZ are provided.
			Distribution of evacuees to reception centers is identified.
			EVACUATIONS (recommendations)
			Reasons for evacuation are discussed.
			Respiratory protection while evacuating is described.
			POTASSIUM IODIDE (requirements)
			Very basic information on the emergency hazard is included in the emergency information materials to inform the public of potential health implications.
			Enough educational information on radiation is given to provide an understanding of sources and relative effects, or this information is provided in separate materials.
			POTASSIUM IODIDE (recommendation)
			Radio-protective drugs such as potassium iodide (KI) (if adopted by ORO for use by the general public) are explained.
			RECEPTION CENTERS/CONGREGATE CARE CENTERS (requirement)
			An EPZ map indicating evacuation routes and directions to and location of reception centers/congregate care centers. Evacuation routes are clearly labeled with the highway number/name. The map includes a legend and compass rose (direction indicator) to assist the reader.
			RECEPTION CENTERS/CONGREGATE CARE CENTERS (recommendation)
			Reception centers or congregate care centers are listed, including recommending evacuees to register at reception centers even if they are not planning to use the congregate care facilities. This would include a brief description of the services and supplies provided.
			PREPLANNING
			A section on family preplanning is provided.
			An emergency supplies checklist to have in the home is included.
			A supplies checklist for use during evacuation is included.
			Home preparation for sheltering is discussed.

3. Foreign Language Translation – Legal Requirements and Location of Information

English is the principal language used for EAS messages, special news/follow-up broadcasts, media releases, and other important information for the public during a radiological incident.

However, if more than 10,000 people or 5 percent of the voting-age population speaks a single language other than English, all the aforementioned information must also be provided in that language. This section explains the legal background and provides a list of states and counties where messages in languages other than English are needed.

a. Legal Background

The Voting Rights Act of 1965[99] includes provisions to ensure that minorities that speak a language other than English are not discriminated against in voting. Specifically, Section 203 of the Act provides that if more than 10,000 people or 5 percent of the voting age population within a jurisdiction are members of a single-language minority group and do not adequately speak or understand English; all voting information is required to be in the other language also. Covered language minorities are limited to American Indians, Asian Americans, Alaskan Natives, and Spanish-heritage citizens – the groups that Congress found to have faced barriers in the political process. After each census, the Census Bureau identifies and lists, via *Federal Register* notice, those jurisdictions covered by the requirement. For further information on section 203 of the act, including its text, a list of covered jurisdictions, and the Attorney General's Minority Language Guidelines, see the Website http://www.justice.gov/crt/about/vot/sec_203/203_brochure.php

b. REP Requirements

The REP Program has adopted similar requirements for providing EAS messages and other advisory information to language minorities. For REP Program purposes, the county (but a township or municipality in some states) will be the lowest jurisdictional subdivision to which the language minority requirements will apply. The translation will only apply to those populations within the EPZ.

The State/site specialist reviews plans/procedures to verify that, if applicable, all emergency information and public information material are in the required languages. During exercises, messages are broadcast (simulated) in English and any other required languages.

For additional State information, visit the State Data Center that can be found on each State Website, or, go to www.census.gov and select the state/county quick facts (on the right side); click on the appropriate State, then select summary, where there is a choice of data sets.

[99] Pub L. No. 89-110, 79 Stat. 437 (codified as amended at 42 U.S.C. 1973 (2006)).

V. DISASTER INITIATED REVIEW

The purpose of a Disaster Initiated Review (DIR), if warranted, is to formally determine the capability of offsite emergency response infrastructure and capabilities to effectively implement approved emergency plans.

The SOG should be implemented consistent with the agreements of the Memorandum of Understanding (MOU) between the FEMA REP Program and the NRC contained in Section I, "Recovery from Disasters Affecting Offsite Emergency Preparedness," of 44 CFR Part 353, Appendix A. In this regard, if a disaster causes damage or changes to the emergency response infrastructure around a licensed operating nuclear power plant to the extent that the damage raises serious questions about the continued adequacy of offsite emergency preparedness, the identifying agency (FEMA REP Program/NRC) will inform the other promptly. These procedures are consistent with those of the *NRC Inspection Manual* Chapter 1601.

These guidelines apply when a power reactor is shut down and an offsite review of emergency preparedness infrastructure is required. If the power reactor is operating and there is a compromise of "reasonable assurance," damage to the offsite emergency preparedness infrastructure or any portion of offsite emergency preparedness is degraded, the FEMA REP Program Regional and HQ management, in consultation with the OROs, and the NRC, will decide on the necessary actions to ensure adequate protection of public health and safety. These guidelines have been developed and are provided to support decision making regarding offsite preparedness under these shutdown conditions. This SOG can be tailored and modified by the FEMA Regional Assistance Committee Chairperson (RAC Chair) and the DIR Team based on the extent of damage and the urgency for plant startup.

Part V: Supplemental Guidance

A. ALERT AND NOTIFICATION SYSTEMS

1. Background

No nuclear power plant (NPP) may operate in the United States without a license from the Nuclear Regulatory Commission (NRC). Before the NRC will grant a license it must determine that, among other things, the emergency plan provides for adequate measures to ensure public health and safety.[100] Alert and notification systems (ANS) are one of the factors the NRC considers in making this determination.[101]

Although the NRC requires an effective ANS as one of the conditions for licensing, it does not determine its adequacy independently.[102] Since 1980, both Congress and the President have required NRC to work with the Federal Emergency Management Agency (FEMA) to assess the adequacy of radiological emergency response plans—which includes ANS—as a condition of obtaining or maintaining a license.[103] Both the NRC and FEMA address how this planning and preparedness assessment occurs in their regulations and guidance.[104] The regulations include the full text of the Memorandum of Understanding (MOU) between FEMA and the NRC hat clarifies each agency's roles and responsibilities.[105]

FEMA's mission and authorities support its role in the NRC licensing process. FEMA's mission is to support our citizens and first responders to ensure that as a nation we work together to build, sustain, and improve our capability to prepare for, protect against, respond to, recover from, and mitigate all hazards.[106] While FEMA has responsibilities within all phases of emergency management, many of FEMA's Radiological Emergency Preparedness (REP) Program activities fall under the preparedness umbrella.[107] The REP Program assesses emergency preparedness for the jurisdictions surrounding commercial NPPs in the United States.

FEMA and NRC use the joint *Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants* (NUREG-0654/FEMA-REP-1) for the review, evaluation, and approval of radiological emergency plans.[108] NUREG-0654/FEMA-REP-1 uses 16 planning standards labeled A through P.[109] NUREG-0654/FEMA-REP-1 also includes evaluation criteria that further define the planning standards. Some of the criteria only apply to licensees; some only to State and/or tribal/local governments; and some apply to all of these groups.[110] Three planning standards apply to ANS: notification methods and procedures (planning standard E); emergency

[100] *See* 42 U.S.C. § 2133(d) (2011) (forbidding any license where, "in the opinion of the Commission, the issuance of a license to such person would be inimical to... the health and safety of the public").

[101] *See, e.g.*, 10 C.F.R. § 50.47 (requiring emergency plans providing "reasonable assurance that adequate protective measures can and will be taken in the event of a radiological emergency" before granting a license); *id.* at § 50.47(b)(5) (citing need for alert and notification system).

[102] Cf. 42 U.S.C. § 2201(f) (2011) (authorizing the NRC to "utilize or employ the services or personnel of any Government agency or any State or local government, or voluntary or uncompensated personnel, to perform such functions on its behalf as may appear desirable" provided that the agency concerned consents).

[103] *See* The Nuclear Regulatory Commission Authorization Act, Pub. L. 96-295 § 109 (Jun. 30, 1980) (requiring NRC to consult with FEMA to determine whether the emergency plans will protect public health and safety); Exec. Order 12,148 § 2-103, 3 C.F.R. 412 (1979), *reprinted as amended* 42 U.S.C. § 5195 (2011) (assigning responsibility for "coordination of natural and nuclear disaster warning systems" to Secretary of Homeland Security, delegated to the FEMA Administrator by DHS Delegation Number 9001.1).

[104] *See generally* 10 C.F.R. Part 50 (presenting NRC regulations); 44 C.F.R. 350 (presenting FEMA regulations).

[105] The text of the *Memorandum of Understanding between Federal Emergency Management Agency and Nuclear Regulatory Commission* is available at 44 C.F.R. Part 353, App. A.

[106] "About FEMA," FEMA, *available at* http://www.fema.gov/about-fema (last visited Sep. 21, 2012). *See also* 6 U.S.C. § 313(b)(1) (2011) (establishing primary mission for FEMA).

[107] See generally 6 U.S.C. § 313(b)(2) (2011) (establishing specific activities for FEMA); 6 U.S.C. § 314 (2011) (establishing authority and responsibilities for the FEMA Administrator); 42 U.S.C. § 5131(a)-(b) (2011) (addressing preparedness authorities); 42 U.S.C. § 5132 (2011) (concerning disaster warnings and providing technical assistance to State and local governments for effective warnings); 42 U.S.C. §§ 5195-5196 (2011) (concerning emergency preparedness).

[108] FEMA regulations incorporate this document by reference. *See* 44 C.F.R. § 350.5(a) (stating "planning and preparedness criteria contained in NUREG-0654/FEMA-REP-1, Rev. 1 are to be used by FEMA and the NRC in reviewing and evaluating State and local government radiological emergency plans and preparedness.").

[109] The planning standards appear in 44 C.F.R. § 350.5(a) and 10 C.F.R. § 50.47(b).

[110] *See* NUREG-0654/FEMA-REP-1, Rev. 1 (1980) (listing which group(s) criteria apply to).

communications (planning standard F); and exercises and drills (planning standard N).[111]

The NRC and FEMA process supports and encourages a meaningful, collaborative relationship with the whole community regarding preparedness. While the NRC possesses direct regulatory authority over the NPP licensees, neither FEMA nor the NRC regulate the offsite response organizations (OROs).[112] FEMA works closely with those OROs who elect to participate in the REP program of exercises and evaluations.[113] In instances where an ORO declines or fails to participate, FEMA may work directly with the applicant/licensee to ensure adequate offsite radiological emergency planning and preparedness.[114] Therefore, this process functions as follows: the NRC requires specific criteria as licensing conditions; FEMA works with either the ORO or the applicant/licensee to determine whether appropriate measures exist to adequately protect the public health and safety in the event of a radiological emergency; FEMA then makes a determination regarding its evaluation of offsite plans and preparedness, and then forwards to the NRC.

The alerting and notification of the public is a function of the State and local governments' emergency plans. A NPP applicant/licensee is required to demonstrate that the administrative and physical means are established for alerting the public and providing instructions, regardless of who implements the a capability. An applicant/licensee may install and maintain the ANS but the responsibility for the alerting and notification of the public, as well as the activation of the ANS, remains with the State and local governments. Experience shows that successful ANS design and implementation occurs when the licensees, OROs, and any other relevant parties collaborate and consider the unique geographic, demographic, and technological factors for the relevant communities.

FEMA evaluators should use this guide alongside the REP Program Manual and NUREG-0654/FEMA-REP-1, in their review of ANS. This guidance includes key ANS evaluation concepts and how to construct an evaluation report.[115]

2. FEMA Evaluation of ANS

Alert and Notification represents a portion of the overall planning and preparedness which FEMA reviews in making its reasonable assurance determination. Approval of the ANS is contained within FEMA's approval of the State's Radiological Emergency Response Plan in accordance with Title 44 of the Code of Federal Regulations (CFR) Part 350.5-350.7.

As part of this process, FEMA staff and leadership collaborate directly with OROs and/or applicants/licensees, when requested. FEMA can offer both planning guidance and technical (i.e., scientific, engineering) assistance.

The initial ANS guidance FEMA and the NRC developed in NUREG-0654/FEMA-REP-1, Rev. 1 App. 3 (1980) and FEMA-REP-10 ("Guidance for the Evaluation of Alert and Notification Systems for Nuclear Power Plants") (1985) predated technology many citizens now take for granted (e.g., smartphones, social media, etc.). This updated guidance for evaluating ANS allows evaluators to account for new technologies, consider updated NRC/FEMA guidance, and incorporate REP lessons learned.

Although updated, this guidance retains many of the principles set forth in the earlier documents. FEMA does not require any specific ANS system, nor will it endorse any system(s). Upon request, FEMA may share examples of approved ANS currently in operation (assuming the owner of the system grants permission to share). However, jurisdictions should remain aware that an ANS that works for one community may not necessarily work in another community after considering all relevant factors (e.g., population, geography). OROs may submit alternative systems and other newer technologies for approval if they can document that the system meets the minimum acceptable

[111] For the full text of these planning standards, see 44 C.F.R. §§ 350.5(5), (6), and (14).

[112] The Atomic Energy Act lists multiple reasons about why Congress enacted legislation to govern nuclear power, including the national interest, military reasons, and the commerce clause. *See, e.g.*, 42 U.S.C. § 2012(c) (2011) (stating process of creating nuclear power "affect[s] interstate and foreign commerce and must be regulated in the national interest."). For a discussion of OROs, please see the REP Program Manual, p. I-3 (defining and explaining term "ORO").

[113] *See generally* 44 C.F.R. Part 350 (setting out program for REP planning, evaluation, and exercises). *Cf.* 44 C.F.R. § 350.7(a) (noting State must "see[k] formal review and approval" from FEMA). This function is separate from FEMA's role in the licensing process; FEMA may evaluate a state or local plan at the request of NRC for licensing purposes regardless of whether the ORO elects to participate. *See* Pub. L. 96-295 § 109 (1980) (Congressional authorization for plan review); 42 U.S.C. § 2201(f) (2011) (authorizing NRC to request assistance from other Federal agencies); 10 C.F.R. § 50.47(a)(2) (addressing FEMA role in licensing process).

[114] *See generally* 44 C.F.R. Part 352 (establishing how FEMA will work with licensees to establish reasonable assurance of protection of public health and safety). *See also* Exec. Ord. 12,657, 3 C.F.R. 611 (1988), *reprinted as amended* 42 U.S.C. § 5195 (2011) (directing means for FEMA to work with licensees who certify OROs either declined or failed to provide sufficient REP plans and preparedness).

[115] For FEMA, the evaluation report generally encompasses the content formerly contained in the Design Report and the ANS/Communications Plan. See page xxx for further explanation.

design objectives. OROs may use alternative systems not yet approved by FEMA concurrently with approved systems to augment the alert and notification process.

a. Evaluation Concepts

ANS alerts people to take an action (e.g., turn on a radio or television) in order to receive a notification. In this context, alert refers to the process used to get the attention of the public, while notification refers to the detailed information and instructions from officials. FEMA considers the entire system of alerts and notifications, but at times its guidance may address the individual components by using the terms "alert" or "notification" independently.

The minimum acceptable design objectives for coverage by the system are: (1) the capability to provide both an alert signal and an informational or instructional message to the population on an area wide basis throughout the 10 mile emergency planning zone (EPZ) within 15 minutes; (2) that the initial notification system will assure direct coverage of essentially 100% of the population within 5 miles of the site; (3) that notification methods will be established to assure coverage within 45 minutes of essentially 100% of the population within the entire plume exposure EPZ who may not have received the initial notification. The basis for any special requirements exceptions (e.g., large water areas with transient boats or remote hiking trails) must be documented; and (4) that utility operators identify and develop, in conjunction with State, local, and tribal governmental officials, the administrative and physical means for a backup public alert and notification system capable of covering essentially 100% of the population within the entire plume exposure EPZ in the event that the primary method is unavailable. The backup means of alert and notification will be conducted within a reasonable time, with a recommended goal of 45 minutes. The basis for any special requirements exceptions (e.g., for large water areas with transient boats or remote hiking trails) must be documented. Assurance of continued notification capability may be verified on a statistical basis. The system plan must include a provision for corrective measure to provide reasonable assurance that coverage approaching the design objectives is maintained. The system will be operable prior to initial operation of greater than 5 percent of rated thermal power of the first reactor at a site. The lack of a specific design objective for a specified percent of the population between 5 and 10 miles which must receive the prompt signal within 15 minutes is to allow flexibility in system design. Designers should do scoping studies at different percent coverages to allow determination of whether an effective increase in capacity per unit cost can be achieved while still meeting the objective of item (1) above.

Although the information above provide for backup ANS means separate from the primary ANS, they do not address backup power. The only current requirement for providing backup power to sirens appears in the Energy Policy Act of 2005; this provision is based on the size of the permanent population within a 50 mile radius in a power plant and currently applies to one site (i.e., Indian Point).

These minimally acceptable design objectives show that FEMA makes its assessment based on the capabilities of the ANS system. The evaluator will ask questions such as: given the geography and population density of the jurisdiction, is the ANS capable of notifying "essentially 100%"? Given the demographics of the population, does the ANS identify the proper channels for notification? How do the ANS operators ensure that the system will perform as expected if needed?

This type of system requires evaluators to adopt a performance-based and results-oriented mindset. The evaluator cannot simply look at the "what" of an ANS; he or she must also look at the "who," where," "when," "why," and "how" of the ANS.

This method of evaluation requires meaningful analysis and avoids prescribing a "one-size-fits-all" or a "cookbook" (i.e., listing specific "ingredients" of an ANS) approach. It proscribes "out of the box" pre-approval. It requires the evaluator to put in additional effort, to study all the available data and verify that the solution the jurisdiction settled upon can and will function as designed. It prevents the evaluator from substituting his or her bias for a type of system (e.g., only approving sirens). It appropriately emphasizes science, technology, and engineering in the ANS realm. Additionally, it eliminates uncertainty for the ANS designers, because so long as the design meets the minimally acceptable design objectives and the plans satisfy the NUREG-0654/FEMA-REP-1, Rev. 1 criteria, the evaluator will recommend a finding of reasonable assurance as it involves ANS.

"Minimally Acceptable Design Objectives": The 15 Minute Design Objective

FEMA and NRC acknowledge that not every radiological emergency at a nuclear power plant will endanger the community living within the 10-mile EPZ within 15 minutes. However, the system must be designed according to the worst-case scenarios. Moreover, even if the incident does not escalate rapidly, the initial notification

should occur without undue delay in order to assure the public health and safety.

b. Initial Planning

When a new ANS, or a change to an existing system is proposed, the FEMA Region should be contacted as early in the design or conceptual phase as practicable to ensure effective coordination of the design, review, and approval process. The FEMA Region will make a determination as to the significance of the proposal and request Regional and/or FEMA Headquarters support, as necessary, for the review and approval process. A FEMA evaluator will be assigned to guide the documentation process and review of the proposal.

The FEMA evaluator must evaluate two aspects of the ANS: the technical aspects and the planning aspects. Any trained FEMA evaluator should possess the capability to assess an ANS plan: what will happen, who is responsible, when will actions occur, and so forth. This evaluation does not require specialized scientific knowledge. The technical evaluation requires the FEMA evaluator to collaborate with a FEMA engineer to ascertain whether the system described in the plan is capable of achieving its stated objectives. Nothing precludes the FEMA engineer from also serving as the FEMA evaluator of record.

c. Integrated Public Alert and Warning System

The Integrated Public Alert and Warning System (IPAWS) is a modernization and integration of the nation's alert and warning infrastructure that will save time when time matters; when protecting life and property.

Federal, State, territorial, tribal, and local alerting authorities may choose to use IPAWS and may also integrate local systems that use Common Alerting Protocol (CAP) standards with the IPAWS infrastructure. IPAWS will give public safety officials an effective way to alert and warn the public about serious emergencies using the Emergency Alert System (EAS), Wireless Emergency Alerts (WAE), National Oceanic and Atmospheric Administration (NOAA) Weather Radio, and other public alerting systems from a single interface.

FEMA encourages the integration of IPAWS with offsite alert and notification plans. As IPAWS is adopted nationwide, technical and planning assistance is available for State, territorial, tribal, and local alerting authorities.

d. The Evaluation Report

Prior REP practice saw applicants/licensees submitting documents about their ANS to FEMA, either directly or through the States. These documents became known as "Design Reports" that presented the information FEMA needed to review before making its reasonable assurance determination. Although the goal of the Design Report was to have a standardized means of reviewing ANS technology, the form and content of the reports varied from site to site. Some reports FEMA received were exceptionally thorough; other reports required a great deal of follow-up.

One key function of the Design Report has been to document NPP licensee owned and operated and FEMA approved ANS systems for Nuclear Regulatory Commission inspection purposes. These Design Reports have been typically maintained on file by the licensees and, for this reason, FEMA will continue to support this documentation requirement. Design Reports may not have multiple amendments to the baseline report. If more than one amendment is required, the Design Report should be revised and released incorporating all amendments along with an updated revision history. The Design Report should be submitted in a commonly used electronic format (e.g., Adobe PDF, Microsoft Office Applications, etc.) on commonly used media (e.g., CD, DVD, Electronic File Transfer, etc.). If other formats or media are desired, the licensee should contact their Regional FEMA office.

However, going forward in conducting its ANS reviews, FEMA will work jointly with state, local, tribal and industry representatives, as applicable, to compile their own Evaluation Report that covers the technical aspects (previously covered in the Design Report) and the planning aspects (ANS/Communications Plans). The next section of this document will address the points of review for technical review of an ANS. FEMA will evaluate the planning aspects under the appropriate NUREG-0654/FEMA-REP-1, Rev. 1 planning standards and criteria.

Assigning responsibility for the Evaluation Report to the FEMA evaluator does not preclude the evaluator from using materials provided by an ORO or a licensee. However, FEMA expects its evaluators to provide their findings in a standardized format, using the template provided in this document.

3. Evaluation Report Template

The Evaluation Report Template should be used as a generic guide when preparing the Evaluation Report for a jurisdictional ANS. This template is flexible enough to account for new systems and/or unconventional approaches. Not all headings in this template are applicable in all cases.

- Introduction
  - Title Page
    - Date
    - Revision number, when applicable
    - Name of Nuclear Power Plant
  - Signature Page
    - State/Tribal Emergency Management Official
    - Utility Emergency Preparedness Supervisor, when applicable
    - Local/County Emergency Management, when applicable
    - FEMA Regional Representative
  - Revision History
  - Table of Contents
  - Executive Summary
- Body of Report
  - Requirements
  - Description/Performance
  - Verification
  - Availability/Reliability
  - Security and Privacy
  - Procedures, Processes, and Quality Assurance
  - Training and Public Outreach
- Attachments
  - Maps, diagrams, references, etc.

a. Introduction of the Evaluation Report

Title Page

The Title Page must contain basic information about the report such as the name of the report, name of the nuclear power plant, date of the report, and applicable revision.

Signature Page

The Signature Page must have signatures of responsible officials attesting to the accuracy, completeness, and approval of the Evaluation Report. Since Alert and Notification is a key component of offsite planning and is part of the State's Radiological Emergency Response Plan approval under 44 CFR Part 350, no ANS design, plan, or revision may be considered by FEMA without the State's concurrence.

Other signatories would typically include the utility emergency preparedness supervisor, the local or county emergency management, the state/tribal emergency management, and the FEMA Regional representative.

Revision History

The Revision History should show a summary of the current revision as well as the history of past revisions. This is typically shown as a table with each past revision and associated summary describing the change in each revision.

Table of Contents

Table of Contents should reflect all sections of the report and any additional relevant information should be included as annexes or appendices.

Executive Summary

The Executive Summary should provide a one to two page overview that describes the overall physical and administrative features and functions of the ANS. If the Evaluation Report is an update to a previous report, it should also include a summary of the changes from the previous report.

b. Body of the Evaluation Report

Below are general points of review that should be addressed in the body of the Evaluation Report, regardless of the type of system used. The next section covers the more specific points of review by system type(s). The information gathered as a result of these points of review, both general and specific, will make up the main content of the report. The topic areas discussed below are all pulled directly from the Evaluation Report template.

Requirements

The requirements that the system or approach is designed to meet should be identified. This includes all requirements specific to the implementation, operation, and administration of the system. This should also include the source of the requirement; which may include NRC and FEMA requirements, current applicable Federal, State or local laws, codes, specifications and standards (e.g., Civil Preparedness Guide 1-17, *Outdoor Warning Systems*), and user and industry requirements. Requirements may be qualitative or quantitative and may include commonly recognized and accepted standards, such as sound pressure levels of 60 and 70dB(C) for areas of differing population densities, or standards developed and promulgated by industry or standard setting organizations, such as the National Emergency Number Association (NENA) for Emergency Telephone Notification Systems (ETNS). In all cases, the applicable requirement should be identified and referenced.

- **System Coverage**
  - Geographical Area – Description of the geographical area intended for system coverage. This may include the entire EPZ or only a portion of it. Those areas not intended for coverage should be identified and include an explanation for omitting coverage (e.g., unpopulated areas, restricted areas, areas addressed by other means such as tone alert radios, etc.).
  - Population – Description or characterization of the population required to be alerted across the geographical area. This may include areas of relatively high or low population densities or populations of special consideration such as those within the 1 or 5 mile EPZ, in the plume pathway, or within institutions such as prisons or hospitals. An acceptable method for estimating population densities is to use census blocks.
  - Means – One commonly accepted standard is sound pressure levels (applicable for sirens) – Description of the sound pressure levels required throughout the alerting area. This may include requirements such as a minimum 70 dB(C) where population densities are greater than 2,000 persons per square mile.
- **Population/Demographics** – Population groups, such as those described below, should be considered and any special requirements identified. For example, public parks frequented by transient guests may initiate a requirement for voice alerting to inform those not familiar with local radiological hazards or those identified with hearing disabilities may require visual cues for alerting. The list below is by no means exhaustive, but merely a list of examples:
  - Urban and Rural
  - Residential and Commercial
  - Permanent Residents
  - Transient Populations
  - Persons with Disabilities
  - Foreign Languages
- **Inter-Operability** – If the system interfaces with other systems, describe how that interface is accomplished.
- **Operation** – Identify all operational requirements. This may include requirements for capability to be activated via multiple remote modes such as internet or mobile phone. Management/Administration – Identify the organizations and/or individual(s) responsible for management and oversight of the system or the administration of third party agreements with vendors.
- **Security/Privacy**
  - Physical Security – Identify physical security requirements such as prevention of unauthorized access to system electronics, intrusion detection at unattended or remote locations, and/or controlled access to control stations.
  - Logical Security – Identify logical security requirements such as prevention of unauthorized or malicious access to the system or accidental or malicious actions resulting in denial of service.
- **Maintenance/Repair**
  - Preventive Maintenance – Identify and describe routine and periodic maintenance requirements.

Typically, this includes, but is not limited to, manufacturer recommendations, manuals and procedures. While copies of the maintenance manuals are not required for the body of the report, the evaluation must ensure that essential procedures and technical resources are readily available.

- Corrective Maintenance – Identify and describe procedures and resources for correcting identified faults.

- **Availability/Reliability** – Identify reliability and availability requirements. NRC requires greater-than 94 percent availability or the elimination of all critical single point failure modes.[116] These requirements may also include system operation in all weather conditions typical for local climate.

- **Testing** – Identify how system performance, availability and reliability is tested and verified on a periodic basis. This includes the frequency and method of testing and what aspects of the system are actually tested. Not all systems lend themselves to full operational testing. In those instances, passive testing, actual event verification and inspection may be considered. In addition, identify how the results of periodic and as-needed testing are recorded, preserved, and available for inspection.

- **Responsibility** – Identify responsibility for system maintenance, testing, and repair. This is in addition to the operational management and administrative section described above.

- **Training** – Identify initial and ongoing training requirements for all associated personnel.

- **Quality Assurance** – Identify and describe a comprehensive, ongoing quality assurance program that may include testing, record-keeping, internal and external inspections and exercises.

Description/Performance

The evaluation provides a detailed description of the overall system or approach; this includes a complete description of all the physical, administrative, and operational components, and their locations. The physical description may include, but is not limited to: system components, interfaces, and functional block diagrams. The administrative description may include, but is not limited to: a description of organizational responsibilities, how the backup ANS is managed, and, where applicable, interfaces and management with third parties. The operational description may include how the ANS is activated. The performance may be shown in a variety of ways including, but not limited to: maps, studies, test results, calculations, surveys, etc. In addition to the description of the system or approach, this section should also demonstrate how the ANS addresses the requirements explained in the Requirements section noted above. The evaluator should exercise caution and not include in the report vendor proprietary information or information not appropriate for public disclosure (e.g., communication frequencies).

The following is an example of an outdoor warning system utilizing sirens:

Description/Performance

- Overview of Siren System
- Functional Block Diagram
- Control System
  - Description of control sub-system
  - Control system features and salient characteristics
  - Quantity of controllers and locations
  - Controller interfaces with other controllers and with sirens
  - Controller interfaces with sirens
  - Controller interfaces with other systems
- Communication System
  - Description of communication sub-system
  - Communication sub-system block diagram (communication and data flow)
  - Communication technology
  - Operating frequency, if applicable
  - Components (e.g., radios, repeaters, transmitters, receivers, etc.)
  - Commercial communication links
- Sirens
  - Type of siren equipment, including make, model, location, elevation
  - Salient characteristics of siren equipment, including output

[116] *See* NRC Inspection Manual, Inspection Procedure 71114.02-01, pg. 5 for further information.

Verification

Verification refers to documenting that the system or approach meets the Requirements identified above. This applies to implementation of new or modified systems or approaches. It should show objectively that the system or approach meets the stated Requirements and can be shown by tests, inspections, demonstrations, analysis, studies, or any other applicable method. Each of the Requirements identified should have a corresponding Verification process. For example:

- Siren Coverage – For Outdoor Warning Systems using sirens, coverage may be verified using the results of Outdoor Sound Propagation Models (OSPM) coverage maps depicting 60 dB(C) and 70 dB(C) isopleths with population density overlays.
- Population/Demographics – Population and demographics information may be verified by identifying credible sources used for the population data. Credible sources may include census data, city or county records or local organization records.

Availability/Reliability

Availability and Reliability may include, but is not limited to, a description of how failures are detected and tracked/trended, how the system is tested and maintained, and how vulnerabilities are identified, reported, and mitigated.

Security and Privacy

With the current methods and advent of the many new ones that may be used for alert and notification, such as various social media applications, Security and Privacy issues have become a central concern. Security and Privacy issues, applicable to the system or approach, should be identified and include how these concerns are mitigated.

Procedures, Processes, and Quality Assurance

This section should describe procedures, processes, and quality assurance processes that are directly applicable to the initial installation, ongoing operation, maintenance, and administration of the ANS. Where third party services are utilized, this section should describe how quality assurance processes will be extended to those third party services.

Training and Public Outreach

This section should address training for all applicable stakeholders of the ANS. This may include training for those who operate and maintain the ANS.

Outreach activities to inform and educate the public represent an essential component of ANS. An informed population is far more likely to understand and respond appropriately to notifications and take action in emergency situations.

c. Attachments

Any additional information that will make the evaluation of an ANS such as maps, diagrams, and/or references should be added to the attachment section.

Appendix A: Abbreviations and Acronyms Used in the REP Program

A	atomic mass
A	ampere
A	activity of isotope
AAM	After-Action Meeting
AAR	After-Action Report
AAR/IP	After-Action Report/Improvement Plan
AC	alternating current
ACP	access control point
ADA	American Disabilities Act
AEC	U.S. Atomic Energy Commission
AECB	U.S. Atomic Energy and Control Board
AEOD	analysis and evaluation of operation data
AGL	above ground level
ALARA	as low as reasonably achievable
ALC	Annual Letter of Certification
AMA	American Medical Association
AMS	Aerial Measuring System
AMTOR	Amateur Telegraphy over Radio
A&N	alert and notification
ANI	American Nuclear Insurers
ANL	Argonne National Laboratory
ANS	Alert and Notification System
ANSI	American National Standards Institute
Anti-Cs	anti-contamination clothing
APR	air-purifying respirator
ARC	American Red Cross
ARCA	Area Requiring Corrective Action
ARES	Amateur Radio Emergency Services
ARG	Accident Response Group
ARM	aerial radiological monitor
ASLB	U.S. Atomic Safety and Licensing Board
α	alpha particle
β	beta particle
b^+	β+ particle (positron)
b^-	β^- particle (electron)
Ba	barium
BEIR	biological effects of ionizing radiation
Btu	British thermal unit
BWR	boiling water reactor
CAP	Civil Air Patrol
CAP	Corrective Action Program
CAP	Common Alerting Protocol
CA	Cooperative Agreement
CC	congregate care
CCC	congregate care center
CD	Civil Defense
CD V	Civil Defense Victoreen
CDC	U.S. Centers for Disease Control and Prevention (HHS)
CDE	committed dose equivalent
CDRG	Catastrophic Disaster Response Group
C&O	Concepts and Objectives (Meeting)
C/E	Controller and Evaluator
CEDE	committed effective dose equivalent
CEM	Certified Emergency Manager
CEMP	Comprehensive Emergency Management Plan
CFA	Cognizant Federal Agency
CFAO	Cognizant Federal Agency Official
cfm	cubic feet per minute
CFR	Code of Federal Regulations
CHEMTREC	Chemical Transportation Emergency Center
Ci	curie
CMAS	Commercial Mobile Alert System
CNSNS	Commission for Nuclear Safety and Safeguards
CPG	Comprehensive Preparedness Guide
cpm	counts per minute

CRCPD Conference of Radiation Control Program Directors

CSEPP Chemical Stockpile Emergency Preparedness Program

Cs cesium

DAC Disaster Application Center

dB Decibel

dBA A-weighted decibel

dBC C-weighted decibel

DBA design-basis accident

DECON decontamination

DFO Disaster Field Office

DHEW U.S. Department of Health, Education, and Welfare

DHS U.S. Department of Homeland Security

DIL derived intervention level

DIR Disaster-Initiated Review

DNA U.S. Defense Nuclear Agency

DOC U.S. Department of Commerce

DOD U.S. Department of Defense

DOE U.S. Department of Energy

DOH U.S. Department of Health

DOI U.S. Department of the Interior

DOL U.S. Department of Labor

DOS U.S. Department of State

DOT U.S. Department of Transportation

DPM disintegrations per minute

DRD direct-reading dosimeter

DRL derived response levels

DRP Division of Radiation Protection (DOH Division)

DRSS Division of Radiation Safety and Safeguards

DSO Director of Site Operations (NRC)

E 911 Enhanced 9-1-1

EAB Exclusion Area Boundary

EACT Emergency Action and Coordination Team

EAL Emergency Action Level

EAS Emergency Alert System [formerly Emergency Broadcast System (EBS)]

EBS Emergency Broadcast System [replaced by the Emergency Alert System (EAS)]

ECC Emergency Communications Center

ECCS emergency core cooling system

ECL Emergency Classification Level

ED Exercise Day

EDE effective dose equivalent

EEG Exercise Evaluation Guide

EEM Exercise Evaluation Methodology (obsolete term)

EENET Emergency Educational Network

EICC Emergency Information Coordination Center (FEMA)

EIS Emergency Information System

EM emergency management

EMI Emergency Management Institute (FEMA)

EMPO Emergency Medical Preparedness Office

EMS Emergency Medical Services

EMT Emergency Medical Technician

EO Emergency Office

E.O. Executive Order of the President

EOC Emergency Operations Center (State, Tribal or local government)

EOF Emergency Operations Facility (utility)

EOP Emergency Operations/Operating Plan or Procedure

EOP extent of play

EOV emergency operations vehicle

EP Emergency Preparedness

EPA U.S. Environmental Protection Agency

EPD electronic personnel dosimeter

EPG Exercise Preparation Guide

EPO Environmental Protection Officer

EPZ Emergency Planning Zone

ER emergency room

ERC Emergency Response Coordinator

ERDA Energy Research and Development Administration

ERPA	Emergency Response Planning Area
ERPG	Emergency Response Guidelines
ERPS	Effluents Radiation Protection Section
ERT	Emergency Response Team
ERT-A	Emergency Response Team – Advance
ESF	Emergency Support Function
ESP	Early Site Permit
EST	Emergency Support Team (FEMA)
ETA	estimated time of arrival
ETE	Evacuation Time Estimate
ETNS	Emergency Telephone Notification System
ETS	Evacuation Time Study
EW	emergency worker
EWAC	emergency worker and assistance center
EWC	emergency worker center
EWMDS	emergency worker monitoring and decontamination station
ExPlan	Exercise Plan
FAA	Federal Aviation Administration
FBI	Federal Bureau of Investigation
FCC	U.S. Federal Communications Commission
FCO	Federal Coordinating Officer
FCP	Field/Forward Command Post
FDA	U.S. Food and Drug Administration
FECC	Federal Emergency Communications Coordinator
FEMA	Federal Emergency Management Agency
FFE	Federal Field Exercise
FMT	Field Monitoring Team
FNF	fixed nuclear facility
FNSS	Functional Needs Support Services
FOC	Forward Operations Center
FPC	Federal Preparedness Coordinator
FPM	Final Planning Meeting
FR	Federal Register
FRC	Federal Regional Center
FRC	Federal Response Center
FRERP	Federal Radiological Emergency Response Plan
FRMAC	Federal Radiological Monitoring and Assessment Center
FRMAP	Federal Radiological Monitoring and Assistance Plan
FRMT	Field Radiological Monitoring Team
FRPCC	Federal Radiological Preparedness Coordinating Committee
FRSSB	Facilities Radiological Safety and Safeguards Branch
FSA	Forward Staging Area
FSAR	Final Safety Analysis Report
FTC	Field Team Coordinator
FTS	Federal Telecommunications System
γ	gamma ray (photon)
GE	General Emergency
GCF	ground concentration factor
Ge (Li)	lithium drifted germanium
GIS	geographic information system
GM	Guidance Memorandum
G-M	Geiger-Mueller (radiation detector)
GMT	Greenwich Mean Time (a.k.a. UTC or Zulu)
GPS	global positioning system
GSA	U.S. General Services Administration
H_2	hydrogen (molecular)
H_2O	water
HAB	hostile action-based
HAZMAT	hazardous materials
HEAR	Hospital Emergency Administrative Radio
HEPA	high-efficiency particulate air (filters)
HF	high frequency
HF	hydrogen fluoride
HHS	U.S. Department of Health and Human Services
HOO	Headquarters Operations Officer (NRC)
HP	health physicist
HPSI	high pressure safety injection
HPT	health physics technician
HSEEP	Homeland Security Exercise and Evaluation Program

HSPD	Homeland Security Presidential Directive
HUD	U.S. Department of Housing and Urban Development
HQ	headquarters
I	iodine
I	exposure intensity
IAEA	International Atomic Energy Agency
IC	Incident Commander
ICPAE	Interagency Committee for Public Affairs in Emergencies
ICP	Incident Command Post
ICS	Incident Command System
IDLH	immediately dangerous to life or health
IEP	Ingestion Exposure Pathway
IMAAC	Interagency Modeling and Atmospheric Assessment Center
INEEL	Idaho National Engineering and Environmental Laboratory
INPO	Institute for Nuclear Power Operations
IP	implementing procedure
IP	Improvement Plan
IPAWS	Integrated Public Alert and Warning System
IPM	Initial Planning Meeting
IRAC	Interagency Radiological Assistance Committee
IRAP	Interagency Radiological Assistance Plan (replaced with FRMAP)
IRZ	Immediate Response Zone
IS	Independent Study
ISCORS	Interagency Steering Committee on Radiation Standards
JIC	Joint Information Center
JIS	Joint Information System
JNC	Joint News Center
JOC	Joint Operations Center
JPIC	Joint Public Information Center
KI	potassium iodide
kV	kilovolt
kW	kilowatt
kWh	kilowatt hour
lbf	pound force
LANL	Los Alamos National Laboratory
LAO	Lead Agency Official
LD	lethal dose
LEPC	Local Emergency Planning Committee
LERN	Law Enforcement Radio Net
LFA	Lead Federal Agency
LLEA	Local Law Enforcement Agency
LLNL	Lawrence Livermore National Laboratory
LOA	Letter of Agreement
LOCA	loss of coolant accident
LPN	licensed practical nurse
LPZ	low population zone
LWR	light water reactor
MAC	Monitoring and Analysis Coordinator
MAELU	Mutual Atomic Energy Liability Underwriters
MERRT	Medical Emergency Radiological Response Team
MERS	Mobile Emergency Response Support
MET	meteorological
MHz	megahertz
MIC	Media Information Center
MOA	Memorandum of Agreement
MOU	Memorandum of Understanding
MPC	maximum permissible concentration
MPM	Midterm Planning Meeting
mR	milliroentgen/millirem
mR/h	milliroentgen per hour
mRem	millirem
MRV	mobile response vehicle
MS-1	Medical Services (term from retired guidance memorandum)
MSEL	Master Scenario Events List
MSHA	U.S. Mine Safety and Health Administration
MT	metric ton
MW	megawatt
MWH	megawatt hour

MUDAC Meteorological and Unified Dose Assessment Center

μ micro

μCi microcuries

NAAQS National Ambient Air Quality Standards

NAERG North American Emergency Response Guidebook

NaI(Tl) sodium iodide doped with thallium (scintillator)

NARAC National Atmospheric Release Advisory Center (DOE)

NARP Nuclear Accident Response Plan (or Procedures)

NASA National Aeronautics and Space Administration

NAWAS National Warning System

NCC National Coordinating Center for Telecommunications

NCP National Contingency Plan

NCRP National Council on Radiation Protection and Measurements

NCS National Communications System

NDA National Defense Area

NEI Nuclear Energy Institute

NEMA National Emergency Management Association

NENA National Emergency Number Association

NEP National Exercise Program

NESC National Exercise Simulation Center

NESP National Environmental Studies Project (NUMARC)

NETC National Emergency Training Center (FEMA)

NEXS National Exercise Schedule

NFPA National Fire Protection Association

NGO non-governmental organization

NIFC National Interagency Fire Center

NIMS National Incident Management System

NIOSH U.S. National Institute for Occupational Safety and Health

NIST U.S. National Institute of Standards & Technology [formerly National Bureau of Standards (NBS)]

NMSS Nuclear Materials Safeguards and Security

NOAA U.S. National Oceanic and Atmospheric Administration

NOUE Notification of Unusual Event

NPD National Preparedness Directorate

NPP nuclear power plant

NPS U.S. National Park Service

NRC U.S. Nuclear Regulatory Commission

NRF National Response Framework

NRIA Nuclear/Radiological Incident Annex (NRF)

NRT National Response Team

NSA National Security Area

NTS Nevada Test Site

NTSB U.S. National Transportation Safety Board

NUMARC Nuclear Management and Resources Council

NUREG NRC nuclear regulatory publication

NUREG-0654 NUREG-0654/FEMA-REP-1, Revision 1, *Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants*, November 1980

NVLAP National Voluntary Laboratory Accreditation Program

NWS U.S. National Weather Service

OAR Office of Air and Radiation

OCRWM Office of Civilian Radioactive Waste Management

OFA Other Federal Agencies

OEM Office of Emergency Management

OMB Office of Management and Budget

OOS Out of Sequence

ORIA Office of Radiation and Indoor Air (EPA)

ORNL Oak Ridge National Laboratory

ORO Offsite Response Organization

OSC Operational Support Center

OSC On-Scene Coordinator/Commander

OSHA U.S. Occupational Safety and Health Administration

OST Operation Support Team

PA Public Address

PA Public Affairs

PAs	Protective Actions
PAD	Protective Action Decision
PAG	Protective Action Guide
PAO	Public Affairs Officer
PAR	Protective Action Recommendation
PAZ	Protective Action Zone
PFO	principal Federal official
PEL	permissible exposure limit
PHS	Public Health Service
PIC	pressurized ion chamber
PIO	Public Information Officer
PKEMRA	Post-Katrina Emergency Management Reform Act
PL	Public Law
POR	Point of Review
PPE	personal protective equipment
ppm	parts per million
PRD	Permanent Record Dosimeter
psi	pounds per square inch
psia	pounds per square inch absolute
psig	pounds per square inch gage
Pu	plutonium
PWR	pressurized water reactor
PZ	Precautionary Zone
§	Part (see CFR)
Q	release rate of activity
Q_i	otopic release rate
Q_T	total activity released
R	roentgen
R/h	roentgen per hour
Ra	radium
RA	Regional Administrator
RAC	Regional Assistance Committee
RAC AC	Regional Assistance Committee Advisory Council
RACES	Radio Amateur Civil Emergency Services
rad	radiation absorbed dose
RADLAB	radiological laboratory
RAM	radioactive material
RAP	Radiological Assistance Program (DOE)
RASCAL	Radiological Assessment System for Consequence Analysis
RC	reception/relocation center
RCC	reception and congregate care
RCF	release conversion factor
RCS	reactor coolant system
RCT	Response Coordination Team
RDO	Radiological Defense Officer
RDO	Regional Duty Officer
REA	Radioactive Emergency Area
REDAM	Radiological Emergency Dose Assessment Model
REL	recommended exposure limit
rem	roentgen equivalent man/mammal
REP	Radiological Emergency Preparedness
RERO	Radiological Emergency Response Operations
RERP	Radiological Emergency Response Plan
RERT	Radiological Emergency Response Team
RF	radio frequency
RG	Review Guide
R/h	roentgens per hour
RIS	Regulatory Issue Summary
RM	Radiological Monitor
RMT	Radiological Monitoring Team
RO	Radiological Officer
ROST	Regional Office Support Team
rpm	revolutions per minute
RPT	radiation protection technician
RRAC	Regional Radiological Assistance Committee
RRCC	Regional Response Coordination Center
RRF	Regional Response Force
RRT	Radiological Response Team
RRT	Regional Response Team
RX	reactor
SAA	State Administrative Agency
SAE	Site Area Emergency

SAR	search and rescue
SAR	Safety Analysis Report
SARA	Superfund Amendments and Reauthorization Act of 1986
SAV	Staff Assistance Visit
SBA	U.S. Small Business Administration
SCBA	self-contained breathing apparatus
SCO	State Coordinating Officer
SEOC	State Emergency Operations Center
SERF	Standard Exercise Report Format
SFO	senior FEMA official (FRERP)
SGTR	steam generator tube rupture
SGTS	standard gas treatment system
SME	subject matter expert
SOG	standard operating guidelines
SPL	Sound Pressure Level
Sr	strontium
SRD	self-reading dosimeter
SRF	Service or Agency Response Force
SRSC	Strategic Review Steering Committee
SRV	safety relief valve
SSA	Senior State Advisor
SSE	safe shutdown earthquake
ST-DOSE	source term to dose
SWAT	special weapons and tactics
TEPW	Training and Exercise Planning Workshop
TBA	thyroid blocking agent (see KI)
TCP	traffic control point
TDD	telecommunications device for the deaf
TEDE	total effective dose equivalent
TEP	Training and Exercise Plan
TH	technological hazards
THD	Technological Hazards Division (FEMA)
TL	Team Leader
TLD	thermoluminescent dosimeter
TMI	Three Mile Island Generating Station
TSC	Technical Support Center
TSP	total suspended particulates
TTC	Technical Training Center
TTX	Tabletop Exercise
U	uranium
µCi	microcurie
UHF	ultra high frequency
UO_2F_2	uranyl fluoride
US&R	urban search & rescue
USACE	U.S. Army Corps of Engineers
USC	United States Code
USCG	U.S. Coast Guard
USDA	U.S. Department of Agriculture
UTC	Coordinated Universal Time (a.k.a. GMT or Zulu)
V	volt
VA	U.S. Veterans Administration
VFD	Volunteer Fire Department
VFR	visual flight rules
VHF	very high frequency
VOAD	Voluntary Organization Active in Disaster
W	watt
WB	whole body
WP	Warning Point
Wt	weight
Z	atomic number
Z	Zulu (a.k.a. UTC or GMT)
Zr	zirconium

Appendix B: Glossary of REP Terms

Absorbed dose: when ionizing radiation passes through living tissue, some of its energy is imparted to the tissue, which absorbs it. The amount of ionizing radiation absorbed per unit mass of the irradiated tissue is called the absorbed dose. It is measured in rads and rems.

Access control: all activities accomplished for the purpose of controlling entry or reentry into an area that has either been evacuated or is under a sheltering protective action decision to minimize the radiation exposure of individuals because of radiological contamination. This function is needed to prevent the general public from entering restricted areas (sheltered and/or evacuated) and permitting only emergency workers with essential missions and limited members of the general public to enter.

Access and functional needs: Those actions, services, accommodations, and programmatic, architectural, and communication modifications that a covered entity must undertake or provide to afford individuals with disabilities a full and equal opportunity to use and enjoy programs, services, activities, goods, facilities, privileges, advantages, and accommodations in the most integrated setting, in light of the exigent circumstances of the emergency and the legal obligation to undertake advance planning and prepare to meet the disability-related needs of individuals who have disabilities as defined by the ADA Amendments Act of 2008, P.L. 110-325, and those associated with them. Access and functional needs may include modifications to programs, policies, procedures, architecture, equipment, services, supplies, and communication methods. Examples of "access and functional needs" services may include a reasonable modification of a policy, practice, or procedure or the provision of auxiliary aids and services to achieve effective communication, such as: (1) an exception for service animals in an emergency shelter where there is a no pets policy; (2) the provision of way-finding assistance to someone who is blind to orient to new surroundings; (3) the provision of transferring and toileting assistance to an individual with a mobility disability; and (4) the provision of an interpreter to someone who is deaf and seeks to fill out paperwork for public benefits.

Accident assessment: the evaluation of the actual and potential consequences of a radiological incident.

Accident Response Group (ARG): Department of Energy response group. A team of scientists, engineers, and technicians that is trained, organized, and equipped to respond to a nuclear weapons accident/incident.

Action levels: see trigger/action levels.

Activated: an emergency operations center or other facility is considered activated as soon as notification of an incident is received and the Director/Commissioner/responsible Representative makes the determination to activate the facility. The facility is not considered *operational* until it is ready to carry out full emergency operations with key decision makers in place.

Activation of personnel: the process by which emergency response personnel are notified of an incident and instructed to report for duty.

Acute exposure: an exposure to radiation that occurs over a short period of time, usually less than an hour.

Adequate: as used in reviews of radiological emergency response plans/procedures, adequate means that the plan/procedure contents are consistent and in full compliance with the requirements delineated in the NUREG-0654/FEMA-REP-1 Planning Standards and Evaluation Criteria or alternative approaches approved by FEMA.

Administration/Finance Section: as applied to an exercise planning team organized according to ICS principles, the team members providing grant management and administrative support throughout exercise development. This group is also responsible for the registration process and coordinates schedules for the exercise planning team, the exercise planning team leader, participating agencies, and the host community or communities.

Administrative Procedures: describe the interaction of the various organizations, as well as the responsibility of each organization involved in the alert and notification sequence.

Advisory Team (A-Team): an emergency response group within the Federal Radiological Preparedness Coordinating Committee tasked with providing protective action recommendations to State and local governments on behalf of its member agencies. The Advisory Team is incorporated into the National Response Framework and is comprised of the individuals from represented agencies who have been

activated to respond as members of the Advisory Team during a radiological incident.

Aerial Measuring System (AMS): a Department of Energy asset consisting of an integrated remote-sensing capability for rapidly determining radiological and ecological conditions of large areas of the environment. In conjunction with modern laboratory and assessment techniques, state-of-the-art airborne equipment is used for extremely low-level gamma radiation detection, high-altitude photography, airborne gas and particulate sampling, and multi-spectral photography and scanning.

After-Action Meeting (AAM): as soon as possible after completion of the draft After-Action Report (AAR), the lead evaluator, members of the evaluation team, and other members of the exercise planning team conduct an AAM to present, discuss, and refine the draft AAR, and to develop an Improvement Plan. This meeting is a chance to present the AAR to participating entities in order to solicit feedback and make necessary changes. A list of corrective actions is generated identifying what will be done to address the recommendations, who (what agency or person) is responsible, and the timeframe for implementation.

After-Action Report / Improvement Plan (AAR/IP): the main product of the evaluation and improvement planning process is the AAR/IP. The AAR/IP has two components: an AAR, which captures observations of an exercise and makes recommendations for post-exercise improvements; and an IP, which identifies specific corrective actions, assigns them to responsible parties, and establishes targets for their completion. The lead evaluator and the exercise planning team draft the AAR and submit it to meeting participants prior to the After-Action Meeting (AAM). The draft AAR is completed first and distributed to meeting participants for review no more than 30 days after exercise conduct. The final AAR/IP is an outcome of the AAM. Final REP AAR/IPs are published no more than 90 days after exercise conduct. Even though the AAR and IP are developed through different processes and perform distinct functions, the final AAR and IP are printed and distributed jointly as a single AAR/IP following an exercise. However, sensitive material may be included in appendices that are not released to the public.

Agreement State: a State that has entered into an agreement under the Atomic Energy Act of 1954, as amended, in which the Nuclear Regulatory Commission has relinquished to such States the majority of its regulatory authority over source, by-product, and special nuclear material in quantities not sufficient to form a critical mass.

Airborne radioactivity: any radioactive material dispersed in the air in the form of dusts, fumes, mists, vapors, or gases.

Air sampler: a device used to collect a sample of radioactive particulates suspended in the air.

ALARA: acronym meaning "as low as reasonably achievable."

Alert: licensee emergency classification level indicating that events are in process or have occurred that involve an actual or potential substantial degradation in the level of plant safety or a security event that involves probable life threatening risk to site personnel or damage to site equipment because of intentional malicious dedicated efforts of a hostile act. Releases are expected to be limited to small fractions of the Environmental Protection Agency protective action guide exposure levels.

Alerting of personnel: transmission of a signal or message that places personnel on notice that an incident has developed that may require that they report for emergency duty.

Alerting the public: activating an attention-getting warning signal through such means as sirens, tone alert radios, route alerting, and speakers on cars, helicopters, and boats.

Alert system: the hardware system(s) used to get the attention of the public within the plume emergency planning zone. An alert system may include a combination of sirens; tone activated radios; vehicles (including boats and airplanes) that used loud speakers/sirens, and other equipment that provides an alert signal.

Alpha particle: a positively charged particle ejected spontaneously from the nuclei of some radioactive elements. It is identical to a helium nucleus that has a mass number of 4 and an electrostatic charge of plus 2. It has low-penetrating power and short range. The most energetic alpha particle will generally fail to penetrate the skin. Alpha is hazardous when an alpha-emitting isotope is introduced into the body. Alpha particles are the least penetrating of the three common types of radiation (alpha, beta, and gamma) and can be stopped by a piece of paper (cannot penetrate skin).

Alternate Emergency Operations Center: an emergency operations center outside the emergency planning zone to which an emergency response organization may relocate if they must evacuate the "home emergency operations center" due to possible radioactive exposure.

Area Requiring Corrective Action (ARCA): an observed or identified inadequacy of organizational performance in an exercise that is not considered, by itself, to adversely impact public health and safety. Correction of ARCAs is verified before or during the next biennial exercise at that site.

Assessment: the evaluation and interpretation of radiological measurements and other information to provide a basis for decision-making. Assessments can include projections of offsite radiological impact.

Atom: the smallest particle of an element that cannot be divided or broken up by chemical means. It consists of a central core called the nucleus, which contains protons and neutrons. Electrons revolve in orbits in the region surrounding the nucleus.

Atomic energy: energy released in nuclear reactions, more appropriately called "nuclear energy." Of particular interest is the energy released when a neutron initiates the breaking up or fissioning of an atom's nucleus into smaller pieces (fission), or when two nuclei are joined together under millions of degrees of heat (fusion).

Automatic Telephone Dialer: a computer programmable telephone dialing system where phone numbers from a computer managed list are automatically called and distributed to destinations.

Background radiation: the level of naturally occurring radiation in the environment. Sources include air, water, soil, potassium-40 in the body and cosmic radiation from the sun. The usually quoted individual background radiation exposure in man's natural environment is an average of 125 millirem per year.

Backup systems: a separate system capable of covering essentially 100% of the population within the entire plume exposure EPZ in the event the primary method is unavailable. The backup means of alert and notification shall be conducted within a reasonable time, with a recommended goal of 45 minutes.

Beta particle: a charged particle emitted from a nucleus during radioactive decay, with a mass equal to 1/1827 that of a proton. A negatively charged beta particle is identical to an electron. A positively charged beta particle is called a positron. Large amounts of beta radiation may cause skin burns, and beta emitters are harmful if they enter the body. Most beta particles can be stopped by aluminum foil.

Body burden: the amount of radioactive material present in the body of a human or an animal.

Boiling water reactor (BWR): a nuclear reactor in which water, used both as coolant and moderator, is allowed to boil in the reactor vessel. The resulting steam is used directly to drive a turbine.

Breeder reactor: a nuclear reactor that produces or "breeds" more fissionable material than it consumes. The reactor is built with a core of fissionable plutonium-239, surrounded by a blanket of uranium-238. As the plutonium fissions, neutrons bombard the uranium converting the uranium blanket to more plutonium-239.

Btu: a British thermal unit. The amount of heat required to change the temperature of 1 pound of water 1 degree Fahrenheit at sea level.

Buffer zone: an area adjacent to a restr1icted zone, to which residents may return, but for which protective measures are recommended to minimize exposure to radiation.

Buffer zone (medical facilities): an area (within a hospital or other medical facility) adjacent to the radiological emergency area (restricted zone) for which protective measures are recommended to minimize both exposure to radiation and the spread of radiological contamination to radiologically clean areas of the facility.

Calibration: the check or correction of the accuracy of a measuring instrument to ensure proper operational characteristics.

Cask: a heavily shielded container used to store and/or ship radioactive materials. Lead and steel are common materials used in the manufacture of casks.

Chain-of-custody form: the documentation of the transfer of samples from one organization and individual to another with respect to the name of the organization and individual and dates of acceptance and/or transfer of samples.

Chain reaction: a fission chain reaction occurs when a fissionable nucleus absorbs a neutron and fissions, relating additional neutrons. These in turn can be absorbed by other fissionable nuclei, releasing more neutrons. A chain reaction is achieved when this process becomes self-sustaining.

Check source: a radioisotope with a known, relatively fixed activity level used to determine the responsiveness of survey instruments.

Chronic exposure: exposure to small doses of radiation over an extended period of time.

Cladding: the outer jacket of nuclear fuel elements. It prevents corrosion of the fuel and the release of fission products into the coolant. Aluminum or its alloys, stainless steel and zirconium are common cladding materials.

Cobalt-60 (Co-60): a radioactive isotope of cobalt formed from natural cobalt-59 by neutron activation in reactors. It is used for medical and industrial applications.

Cognizant Federal Agency (CFA): the Federal agency that owns, authorizes, regulates, or is otherwise deemed responsible for the radiological activity causing the emergency and that has the authority to take action on site.

Cognizant Federal Agency Official (CFAO): lead official designated by the Cognizant Federal Agency to manage its response at the site of a radiological emergency.

Command Staff: as applied to an exercise planning team organized according to ICS principles, the team members responsible for coordinating all exercise planning activities. Within this group is the exercise planning team leader, who assigns exercise activities and responsibilities, provides guidance, establishes timelines, and monitors the development process. The safety controller and the liaison coordinator report directly to the exercise planning team leader.

Commercial Mobile Alert System (CMAS): CMAS (also known as Wireless Emergency Alerts (WEA) or Personal Localized Alerting Network (PLAN)) is a new public safety system that allows customers who own an enabled mobile device to receive geographically-targeted, text-like messages alerting them of imminent threats to safety in their area. The new technology ensures that emergency alerts will not get stuck in highly congested user areas, which can happen with standard mobile voice and texting services. CMAS was established pursuant to the Warning, Alert and Response Network (WARN) Act.

CMAS enables government officials to target emergency alerts to specific geographic areas through cell towers (e.g., lower Manhattan), which pushes the information to dedicated receivers in CMAS-enabled mobile devices.

CMAS complements the existing Emergency Alert System (EAS) which is implemented by the FCC and FEMA at the federal level through broadcasters and other media service providers.

Wireless companies volunteer to participate in CMAS. CMAS is the result of a unique public/private partnership between the FCC, FEMA and the wireless industry with the singular objective of enhanced public safety.

Participating wireless carriers were required to deploy CMAS by April 7, 2012.

Commercial nuclear power plant (NPP): facility licensed by the Nuclear Regulatory Commission to use a nuclear reactor to produce electricity for sale to the general public. While there are many types of nuclear facilities, FEMA's responsibility for offsite planning and preparedness and the guidance in the REP Program Manual are applicable only to commercial nuclear power plants.

Committed dose: the dose that will be received over a period of 50 years from the ingestion or inhalation of a particular quantity of a radionuclide or a specific mix of radionuclides.

Committed dose equivalent (CDE): the dose equivalent to organs or tissues of reference that will be received from an intake of radioactive material by an individual during the 50-year period following ingestion.

Committed effective dose equivalent (CEDE): the sum of the 50-year committed doses to individual organs from inhalation (or ingestion) of radionuclides, where the individual organ doses have been weighted so that the associated risk of fatal cancer can be added to the risk of fatal cancer from whole-body dose.

Common Alerting Protocol (CAP): is a digital format for exchanging emergency alerts that allows a consistent alert message to be disseminated simultaneously over many different communications systems.

Concepts and Objectives (C&O) Meeting: the formal beginning of the exercise planning process. It is held to ensure that exercise planners agree upon the already-identified type, scope, capabilities, objectives, and purpose of the exercise. For less complex exercises and for entities with limited resources, the C&O Meeting can be conducted in conjunction with the Initial Planning Meeting (IPM); however, when exercise scope dictates, the C&O Meeting is held first. Representatives from the sponsoring agency or organization, the exercise planning team leader, and senior officials typically attend the C&O Meeting to identify an overall exercise goal, develop rough drafts of exercise capabilities and objectives, and identify exercise planning team members.

Congregate care (CC): the provision of temporary housing and basic necessities for evacuees.

Congregate care center (CCC): a facility for temporary housing, care, and feeding of evacuees.

Containment: the provision of a gas-tight shell or other enclosure around a reactor that confines fission products and prevents their release to the environment in an accident.

Contaminated: the condition resulting from the adhesion of radioactive particulates to the surface of structures, areas, objects, or personnel.

Contaminated injured individuals: individuals who are: (1) contaminated with radioactive material that cannot be removed by the simple methods described in NUREG-0654/FEMA-REP-1, Evaluation Criteria J.12 and K.5.b; or (2) contaminated and otherwise physically injured. Individuals exposed to high levels of radiation may be injured but not contaminated.

Contamination: refers to radioactive materials not in their intended containers. Whether the contamination is considered "fixed" or "loose" depends on the degree of effort required to unfix or remove the contamination from a surface.

Contextual inject: a controller-introduced message to a player to help build the exercise operating environment. For example, if the exercise is designed to test information-sharing capabilities, a Master Scenario Events List inject can be developed to direct a controller to select an actor to portray a suspect. The inject could then instruct the controller to prompt another actor to approach a law enforcement officer and inform him/her that this person was behaving suspiciously.

Contingency inject: a controller message introduced verbally to a player if players are not performing the actions needed to sustain exercise play. This ensures that play moves forward, as needed, to adequately test performance of activities. For example, if a simulated secondary device is placed at an incident scene during a terrorism response exercise, but is not discovered, a controller may want to prompt an actor to approach a player to say that he/she witnessed suspicious activity close to the device location. This prompts the responder's discovery of the device, and result in subsequent execution of the desired notification procedures.

Control cell: exercise personnel who facilitate interfaces with nonparticipating groups, such as ORO officials and persons with disabilities and access/functional needs.

Control rod: a rod containing a material that readily absorbs neutrons (such as boron). It is used to control the power of a nuclear reactor. By absorbing neutrons, a control rod slows the fission chain reaction by preventing neutrons from causing further fission.

Control room: the area in a nuclear power plant from which most of the plant power production and emergency safety equipment can be operated by remote control.

Controlled area: a defined area in which the occupational exposure of personnel to radiation or radioactive material is under the supervision of an individual in charge of radiation protection.

Controller: the individual directing the flow of scenario events in order to ensure that the conduct of an exercise is conducted in accordance with the agreed-upon exercise objectives and the extent of play.

Controller/Evaluator (C/E) briefing: a pre-exercise overview for controllers, evaluators, and exercise administrative staff. The briefing summarizes the C/E Handbook (or the Controller/Staff Instructions and Evaluation Plan) and focuses on explaining the roles and responsibilities of controllers and evaluators. This is the time to address any changes in the exercise and answer final questions. It is generally 1-2 hours in length and is conducted the day before an operations-based exercise.

Controller/Evaluator (C/E) Handbook: an exercise overview and instructional manual for controllers and evaluators. A supplement to the Exercise Plan, it contains more detailed information about the scenario, and describes controllers' and evaluators' roles and responsibilities. Because the C/E Handbook contains information on the scenario and exercise administration, it is distributed only to those individuals specifically designated as controllers or evaluators. Larger, more complex exercises may use a separate Controller/Staff Instructions and Evaluation Plan in place of the C/E Handbook.

Controller injects: the introduction of events, data, and information into exercises to drive the demonstration of objectives.

Coolant: a substance, usually water, circulated through a nuclear reactor to remove or transfer heat.

Cool down: the gradual decrease in reactor fuel rod temperature caused by the removal of heat from the reactor coolant system.

Cooling tower: a heat exchanger designed to aid in the cooling of water that was used to cool exhaust steam exiting the turbines of a power plant. Cooling towers transfer exhaust heat into the air instead of into a body of water.

Coordinate: to bring into common action so as not to unnecessarily duplicate or omit important actions (does not involve direction of one agency by another).

Core: the central portion of a nuclear reactor containing the fuel elements, moderator, neutron poisons, and support structures.

Core Capabilities: distinct critical elements necessary to achieve the specific mission areas of prevention, protection, mitigation, response, and recovery. Capabilities provide a common vocabulary describing the significant functions required to deal with threats and hazards that must be developed and executed across the whole community to ensure national preparedness.

Core melt accident: a reactor accident in which the fuel core melts because of overheating.

Corrective action: corrective actions are the concrete, actionable steps outlined in Improvement Plans that are intended to resolve preparedness gaps and shortcomings experienced in exercises or real-world events.

Corrective action plan (CAP): an element of improvement planning through which corrective actions from the After-Action Report/Improvement Plan are prioritized, tracked, and analyzed continuously until they have been fully implemented and validated.

Counting: using an instrument to detect individual particles or gamma rays which interact with the detector on the instrument. For example, ambient radiation can be counted, or, alternatively, the radiation emitted by specific samples can be counted in units of counts per minute (cpm) or counts per second (cps).

Criticality: a term used in reactor physics to describe the state when the number of neutrons released by fission is exactly balanced by the neutrons being absorbed (by the fuel and poisons) and escaping the reactor core. A reactor is said to be "critical" when it achieves a self-sustaining nuclear chain reaction.

Cumulative dose (radiation): the total dose resulting from repeated exposure to radiation of the same body region, or of the whole body.

curie (Ci): the basic unit to describe the intensity of radioactivity in a sample of material. One curie is equal to 37 billion disintegrations (nuclear transformations) per second. So, in 1 curie, 37 billion atoms decay in 1 second. Several commonly used fractions of the curie include:

- millicurie: 1/1,000 of a curie, (one-thousandth of a curie, abbreviated mCi)
- microcurie: 1/1,000,000 of a curie, (one-millionth of a curie, abbreviated μCi)
- nanocurie: 1/1,000,000,000 of a curie, (one-billionth of a curie, abbreviated nCi)
- picocurie: 1/1,000,000,000,000 of a curie (one-trillionth of a curie, abbreviated pCi)

Day cares: a specialized program or facility that provides care for children from infants through preschool age, usually within a group framework, and dependent children or adults, either as a substitute for or an extension of home care. Day cares may be licensed or unlicensed.

dB(C): the measurement of audio signals. The C weighting approximates the human ear sensitivity to relatively high sound levels.

Debrief: a forum for planners, facilitators, controllers, and evaluators to review and provide feedback after the exercise is held. It is a facilitated discussion that allows each person an opportunity to provide an overview of the functional area they observed and document strengths and areas for improvement. The exercise planning team leader facilitate debriefs, and results are captured for inclusion in the After-Action Report/Improvement Plan. (NOTE: Other sessions, such as a separate debrief for hospitals during an operations-based exercise, may be held as necessary.) A debriefing is different from a hot wash, in that a hot wash is intended for players to provide feedback.

Decay (radioactive): the decrease in the radiation intensity of any radioactive material with respect to time.

Decontamination: the process of making any person, object, or area safe by absorbing, destroying, neutralizing, making harmless, or removing chemical or biological agents, or by removing radioactive material clinging to or around it.

Decontamination station: a building or location suitably equipped and organized where personnel and material are cleansed of chemical, biological, or radiological contaminants.

Deficiency: an observed or identified inadequacy of organizational performance in an exercise that could cause a finding that offsite emergency preparedness is not adequate to provide reasonable assurance that appropriate protective measures can be taken in the event of a radiological emergency to protect the health and safety of the public living in the vicinity of a nuclear power plant. Deficiencies must be corrected within 120 days of the exercise.

Demonstration Criterion: one of the 34 specific demonstration standards outlined in the FEMA REP Program Manual for offsite response organization response capability that are evaluated during a REP exercise.

Depleted uranium: uranium having a percentage of uranium-235 smaller than the 0.7% found in natural uranium. It is obtained from spent (used) fuel elements or as byproduct tails or residues from uranium isotope separation.

Derived intervention levels (DILs): concentration derived from the intervention level of dose at which the Food and Drug Administration recommends consideration of protective measures. DILs correspond to the radiation concentration in food throughout the relevant time period that, in the absence of any intervention, could lead to an individual receiving a radiation dose equal to the protective action guide or in international terms the intervention levels of dose.

Derived response level (DRL): the calculated concentration of a particular radionuclide in a particular medium (e.g., food) that will produce a dose equal to a protective action guide.

Design and development: building on the exercise foundation, consists of identifying capabilities, tasks, and objectives; designing the scenario; creating documentation; coordinating logistics; planning exercise conduct; and selecting an evaluation and improvement methodology.

Direction and control: the management of emergency functions within a particular context (e.g., an emergency operations center) through leadership and use of authority.

Direct-reading dosimeter (DRD): a small ionization detection instrument that indicates radiation exposure directly. An auxiliary charging device is usually necessary. DRDs can be read in real time by the user. A DRD is also referred to as a "pocket dosimeter."

Dose: the quantity of energy absorbed from ionization per unit mass of tissue. The rad is the unit of absorbed dose.

Dose equivalent: (1) A term used to express the amount of effective radiation when modifying factors have been considered. (2) The product of absorbed dose multiplied by a quality factor multiplied by a distribution factor. It is expressed numerically in rem. (3) The product of the absorbed dose in rad, a quality factor related to the biological effectiveness of the radiation involved and any other modifying factors.

Dose limits for emergency workers: the allowable accumulated dose during the entire period of the emergency. Action to avoid exceeding the limit is taken based on actual measurements of integrated gamma exposure. In contrast, protective action guides are trigger/action levels of projected dose at which actions are taken to protect the public. These actions are taken prior to the dose being received.

Dose rate: the radiation dose delivered per unit time. The dose rate may be expressed numerically in rads per second or rads per hour.

Dosimeter: a portable device such as a thermoluminescent film badge or direct-reading ionization chamber used for measuring and registering the total accumulated exposure to ionizing radiation.

Dosimetry: the measurement of radiation doses. It applies to both the devices used (dosimeters) and to the techniques.

Drill: an event involving organizational responses to a simulated accident to develop, test, and monitor specialized emergency skills that constitute one or more components of emergency plans/procedures.

Early phase: (also referred to as the plume or emergency phase) the period at the beginning of a nuclear incident when immediate decisions for effective use of protective actions are required and must therefore usually be based primarily on the status of the nuclear power plant and the prognosis for worsening conditions. When available, predictions of radiological conditions in the environment based on the condition of the source or actual environmental measurements may also be used. Precautionary actions may precede protective actions based

on the protective action guides. This phase lasts hours to several days and ends when the radioactive release ends.

Effective dose equivalent (EDE): the sum of the products of the dose equivalent to each organ on a weighting factor, where the weighting factor is the ratio of the risk of mortality from delayed health effects arising from irradiation of a particular organ or tissue to the total risk of mortality from delayed health effects when the whole body is irradiated uniformly to the same dose.

Electron: a stable, negatively charged elementary particle of matter. Electrons orbit the positively charged nucleus of the atom.

Element: one of the 103 known chemical substances that cannot be broken down further without changing its chemical properties. Some examples include hydrogen, nitrogen, gold, lead, and uranium.

Emergency: an unexpected event during the operation of a nuclear power plant that has a significant effect on the safety of the facility, personnel or the public.

Emergency Action and Coordination Team (EACT): the Department of Energy senior management team at Department of Energy headquarters that coordinates the initial National Response Framework response to a radiological emergency.

Emergency Alert System (EAS): a system of radio and television stations responsible for providing official government instructions to the public (formerly the Emergency Broadcast System).

Emergency Classification Level (ECL): classifications used by the licensee to classify incidents. The four ECLs are Notification of Unusual Event, Alert, Site Area Emergency, and General Emergency.

Emergency Information and Coordination Center (EICC): the FEMA 24-hour national emergency center from which the Emergency Support Team operates. Emergency Information and Coordination Center communications link the Senior Federal Official, FEMA Regional and headquarters staff, and other Federal departments and agencies at the national level with one another.

Emergency information: material designed to improve public knowledge or understanding of an emergency.

Emergency instructions: information provided to the general public during an emergency pertaining to protective action recommendations for actions such as evacuation and sheltering.

Emergency Operations Center (EOC): a facility that is the primary base of emergency operations for an offsite response organization in a radiological emergency.

Emergency Operations Facility (EOF): a facility that is the primary base of emergency operations for the Licensee in a radiological incident. An onsite operations facility provided by the NRC Licensee to facilitate the management of an overall emergency response. Utility and State officials, and a very limited number of Federal personnel may be accommodated.

Emergency phase: see "early phase."

Emergency Planning Zone (EPZ): a geographic area surrounding a commercial nuclear power plant for which emergency planning is needed to ensure that prompt and effective actions can be taken by offsite response organizations to protect the public health and safety in the event of a radiological accident. The plume pathway EPZ is approximately 10 miles in radius, while the ingestion pathway EPZ has a radius of approximately 50 miles.

Emergency protective actions: protective actions to isolate food to prevent its introduction into commerce and to determine whether condemnation or other disposition is appropriate.

Emergency response planning area: see "planning area."

Emergency Support Team (EST): the FEMA Headquarters' team that carries out notification, activation, and coordination procedures from the FEMA Emergency Information and Coordination Center. The EST is responsible for Federal agency headquarters coordination, staff support of the FEMA Administrator, and support of the Senior Federal Official.

Emergency worker (EW): individual who has an essential mission to protect the health and safety of the public who could be exposed to ionizing radiation from the plume or from its deposition. Some examples of emergency workers are: radiation monitoring personnel; traffic control personnel; fire and rescue personnel, including ambulance crews; medical facilities personnel; emergency operations center personnel; personnel carrying out route alerting procedures; and essential services or utility personnel; and evacuation vehicle (e.g., bus, van, etc.) drivers. Note that evacuation vehicle drivers who will be transporting

individuals or groups out of the emergency planning zone and who are not expected to return to the emergency planning zone are not considered "Emergency Workers."

Equipment: FEMA currently recognizes fixed sirens, route alerting, TARs, and NOAA weather radio as acceptable primary and backup alert systems. , EAS, NOAA weather radio, and route alerting are acceptable notification systems. OROs may submit alternative systems and other newer technologies for approval if they can document that the system meets the minimum acceptable design objectives. OROs may use alternative systems not yet approved by FEMA concurrently with approved systems to augment the alert and notification process.

Essential emergency functions: these include communications, direction and control of operations, alert and notification of the public, accident assessment, information for the public and media, radiological monitoring, protective response, and medical and public health support.

Evacuation (Citizen Evacuation): a population protection strategy involving orderly movement of people away from an actual or potential hazard, and providing reception centers for those without their own resources for temporary relocation.

Evacuation Time Estimate (ETE): an estimate, contained in emergency plans/procedures, of the time that would be required to evacuate general and persons with disabilities and access/functional needs within the plume pathway emergency planning zone under emergency conditions.

Evaluation: the process of observing exercise performance to document strengths and opportunities for improvement in an entity's preparedness and response capability. Evaluation is the first step in the improvement process.

Evaluation module: the former term for a tool used by evaluators to document exercise performance. The current terminology for this tool is Exercise Evaluation Guide.

Evaluation team: a group of individuals trained to observe and record player actions. These individuals are familiar with the exercising entity's plans, policies, procedures, and agreements.

Evaluator: a qualified individual who observes, measures, and assesses performance, captures issues, and analyzes exercise results. Evaluators assess and document players' performance against established emergency plans/procedures and Demonstration Criteria. Evaluators note the actions/decisions of players without interfering with exercise flow.

Exception area: an area located approximately 5 to 10 miles from a nuclear power plant and specifically designated in an offsite response organization's plans/procedures for which FEMA has granted an exception to the requirement for the capability to complete alert and notification of the public within 15 minutes. Most exception areas are recreation areas or similar low-population within the emergency planning zone. Offsite response organizations must have the capability to complete alert and notification of the public in approved exception areas within 45 minutes.

Exclusion area: the area surrounding a nuclear reactor in which the facility operator has the authority to determine all activities, including exclusion or removal of personnel and property from the area. A specific area off-limits (expressed in miles) from a nuclear power plant.

Exercise: see Radiological Emergency Preparedness (REP) Exercise.

Exercise Evaluation Guides (EEGs): documents that support the exercise evaluation process by providing evaluators with consistent standards for observation, analysis, and After-Action Report/Improvement Plan development. Each EEG is linked to a core capability.

Exercise issue: a problem in organizational exercise performance that is linked with specific NUREG-0654/FEMA-REP-1 Planning Standards and applicable Evaluation Criteria. There are two categories of exercise issues: Deficiencies and Areas Requiring Corrective Action.

Exercise Plan (ExPlan): general information document that helps operations-based exercises run smoothly. The ExPlan is published and distributed prior to the start of exercise and provides a synopsis of the exercise. In addition to addressing exercise objectives and scope, the ExPlan assigns activities and responsibilities for successful exercise execution. It enables participants to understand their roles and responsibilities in exercise planning, execution, and evaluation. The ExPlan is intended for use by exercise players and observers—therefore, it does not contain detailed scenario information that may reduce the realism of the tasks to be performed. Players and observers review all elements of the ExPlan prior to exercise participation.

Exercise Planning Team: group of individuals responsible for all aspects of an exercise, including exercise planning, conduct, and evaluation. The planning team determines

exercise capabilities, tasks, and objectives; tailors the scenario to the entity's needs; and develops documents used in exercise simulation, control, and evaluation. The exercise planning team is ideally comprised of representatives from each major participating jurisdiction and agency, but should be kept to a manageable size. While entities may find it advantageous to include team members with previous exercise planning experience, membership can be modified to fit the type or scope of an exercise. Planning team members are ideal selections for controller and evaluator positions during the exercise because advanced scenario knowledge renders them ineligible to participate as players. An exercise planning team leader manages the exercise planning team, which can be structured using the principles of the ICS, with Command Staff, Planning Section, Logistics Section, Administration/Finance Section, and Operations Section.

Exercise Planning Team Leader: individual who oversees the exercise planning team; develops the exercise project management timeline and the exercise project management assignment list; assigns exercise responsibilities; provides overall guidance; and monitors the development process.

Exercise Program Management: the functions required for an entity to sustain a variety of exercises targeted toward preparedness priorities on an ongoing basis. It includes project management, budgeting, grant management, staff hiring, funding allocation, and expenditure tracking. Program management functions cyclically. First, a Multi-Year TEP is developed in consideration of an entity's preparedness priorities. Next, specific exercises are carried out according to the multi-year plan's timelines and milestones. Finally, Improvement Plan corrective actions identified through exercises are taken into account when developing priorities for the next multi-year plan. Responsibilities for these tasks are complementary and require that all relevant parties collaborate to successfully administer exercises.

Exposure: the absorption of radiation or ingestion of a radionuclide. The exposure at a given point is a measurement of radiation in relation to its ability to produce ionization. The unit of measurement of the exposure is the roentgen. A measure of radiation dose received by a person, usually broken down and used to refer to whole-body exposure compared with exposure to the hands only.

Exposure rate: the amount of gamma radiation that an individual would receive in 1 hour as measured in air (typically expressed in units of microrem per hour, millirem per hour or rem per hour).

Extent of play: the level of play vs. simulation at an emergency response exercise. Each REP Demonstration Criterion contains a "default" extent of play that evaluators and response organizations use to define parameters for the expected performance under that criterion.

Extent-of-Play Agreement: a document negotiated during the exercise planning process that customizes the default performance expectations found in the Assessment Area Demonstration Criteria. The Extent-of-Play Agreement may include identification of the Demonstration Criteria that will or will not be evaluated during the exercise, entities responsible for demonstrating specific criteria, equipment (including vehicles to be used), personnel to be deployed, facilities to be activated, etc.

Extremities: the hands and forearms and, with restrictions, the head, feet, and ankles. (Permissible radiation exposures in these regions are generally greater than in the whole body because they contain less blood-forming material and have smaller volumes for energy absorption.)

Facility: any building, center, room(s), or mobile unit(s) designed and equipped to support emergency operations.

Federal or other support organizations: Federal agencies such as FEMA, Department of Energy, the Nuclear Regulatory Commission, or any other governmental, quasi-governmental, or private organizations (e.g., American Red Cross, Civil Air Patrol, Amateur Radio Emergency Services, and Radio Amateur Civil Emergency Services, cooperating State compact radiological monitoring or sampling personnel, and national or university laboratories) that may provide assistance in radiological emergencies.

Federal Coordinating Officer (FCO): the Federal official appointed by the President upon declaration of a major disaster or emergency under Public Law 93-288 to coordinate the overall Federal response.

Federal Emergency Management Agency (FEMA): the agency responsible for establishing Federal policies for and coordinating all civil defense and civil emergency planning, management, mitigation, and assistance functions of executive agencies. FEMA assists State, local, and Tribal agencies in their emergency planning. Its primary role is one of coordinating Federal, State, local, Tribal, and volunteer response actions.

Federal Radiological Emergency Response Plan (FRERP): a former plan for coordinating Federal response to any type of peacetime radiological emergency requiring significant

Federal response. Issued in 1996 (61 FR 20944), it superseded the Interagency Radiological Assistance Plan and the Federal Radiological Monitoring and Assessment Plan. The FRERP has been superseded by the National Response Framework.

Federal Radiological Monitoring and Assessment Center (FRMAC): a center usually located at an airport near the scene of a radiological emergency from with the Department of Energy Offsite Technical Director conducts the National Response Framework response. This center need not be located near the onsite or Federal-State operations centers as long as its operations can be coordinated with them.

Federal Radiological Monitoring and Assessment Plan (FRMAP): a former plan to provide coordinated radiological monitoring and assessment assistance to the offsite response organizations in response to radiological emergencies. The FRMAP was superseded in 1996 by the Federal Radiological Emergency Response Plan. The Federal Radiological Emergency Response Plan has been superseded by the National Response Framework.

Federal Radiological Preparedness Coordinating Committee (FRPCC): the National level coordination mechanism to provide technical assistance to offsite response organizations (see 44 CFR Part 35l).

Federal Response Center (FRC): the on-scene focal point established by the Senior FEMA Official, as required, for coordinating the Federal response to an incident. Representatives of other Federal, State, local, Tribal, and volunteer agencies will be located in the center.

Feed water: water supplied to the reactor pressure vessel (in a boiling water reactor) or the steam generator (in a pressurized water reactor) that removes heat from the reactor fuel rods by boiling and becoming steam. The steam becomes the driving force for the plant turbine generator.

Field Command Post (FCP): a center, either mobile or fixed, set up in a location convenient to the accident site, to facilitate emergency response, especially, for example, accident assessment activities such as direction of the field monitoring teams.

Field Team Coordinator (FTC): the individual who manages the functions of field teams and coordinates data with the dose assessment group located in emergency operation centers and facilities.

Film badge: a photographic film packet to be carried by personnel, usually in the form of a badge, used for measuring and permanently recording gamma ray dosage. A thermoluminescent dosimeter is a type of film badge.

Field Monitoring Team (FMT): includes groups used to detect and monitor radiation in the environment (e.g., measuring the concentration of radiation in the air, water, vegetation, soil, etc.).

Final Planning Meeting (FPM): the final forum for the exercise planning team to review the process and procedures for exercise conduct, final drafts of all exercise materials, and all logistical requirements. During the FPM, there are no major changes made to either the design or the scope of the exercise, nor to any supporting documentation. The FPM ensures all logistical requirements have been arranged, all outstanding issues have been identified and resolved, and all exercise products are ready for printing.

Fission: the splitting of an atomic nucleus into two approximately equal parts accompanied by the release of large amounts of energy and one or more neutrons.

Fission gases: those fission products that exist in the gaseous state. Primarily the noble gases (e.g., krypton, xenon, radon).

Fixed nuclear facility (FNF): a stationary nuclear installation that uses or produces radioactive materials in its normal operations. Fixed nuclear facilities include commercial nuclear power plants and other fixed facilities.

Fixed contamination: contamination that remains after loose contamination has been removed by decontamination.

Fixed (reproducible) geometry: a method of measuring levels of radioactivity in samples by using a standard size or volume of samples held at a fixed distance from the measuring instrument.

Fixed sirens: FEMA classifies any device used to provide an audible alerting signal outdoors from a fixed location as a siren. This includes mechanical (e.g., whistles, horns), electro-mechanical, and electronic devices capable of producing audible tones.

Food chain: the pathway of any material through the environment to edible plants, animals and ultimately to humans.

Forward emergency operations center: if the State emergency operations center is a significant distance from the plant site, the plans/procedures may indicate that a

near-site or forward emergency operations center will be established at the time of an accident.

Forward Command Post (FCP): a location near the affected area used to direct the activities of State field personnel performing emergency tasks in support of local government response. This location may also be used for location for field team coordination.

Forward Operations Post: a location in or near the affected area used to coordinate the monitoring and sampling activities of the Radiological Emergency Response Teams.

Forward Staging Area (FSA): location near the incident site for collection and preparation of resources for deployment.

Fuel cycle: the series of steps involved in supplying fuel for nuclear power reactors. It includes mining, fabrication of fuel elements and assemblies, their use in a reactor, reprocessing spent fuel and refabrication into new fuel elements.

Fuel element: a rod or other form into which nuclear fuel is fabricated for use in a nuclear reactor.

Full participation exercise: per 44 CFR 350.2(j), a joint exercise in which: (1) State, local, and Tribal organizations, licensee emergency personnel, and other resources are engaged in sufficient numbers to verify the capability to respond to the actions required by the accident/incident scenario; (2) the integrated capability to adequately assess and respond to an accident at a commercial nuclear power plant is tested; and (3) the implementation of the observable portions of State, local, and Tribal plans/procedures is tested.

Full-Scale Exercise: in accordance with HSEEP, a full-scale exercise is a multi-agency, multi-jurisdictional, multi-discipline exercise involving functional (e.g., joint field office, emergency operations centers, etc.) and "boots on the ground" response (e.g., firefighters decontaminating mock victims). For the purposes of the REP Program, a full-scale exercise meets the intent of the full-participation exercise.

Functional Exercise: an exercise that sufficiently engages organizations to test their abilities to respond to the scenario, but participation is less than full-scale. Most REP biennial joint exercises are functional exercises because they simulate some response capabilities or demonstrate them out of sequence from the scenario, and the exercise may not require participation of all offsite entities that would respond in a real radiological emergency.

Functional Needs Support Services (FNSS): Services that enable children and adults to maintain their usual level of independence in a general population shelter. FNSS includes reasonable modifications to policies, practices, and procedures, durable medical equipment (DME), consumable medical supplies (CMS), personal assistance services (PAS), and other goods and services as needed. Children and adults requiring FNSS may have physical, sensory, mental health, and cognitive and/or intellectual disabilities affecting their ability to function independently without assistance. Others who may benefit from FNSS include women in late stages of pregnancy, elders, and those needing bariatric equipment.

Fusion: the formation of a heavier nucleus from two lighter ones, with the release of energy.

Gamma rays: the most penetrating of the three types of ionizing radiation, gamma rays are electromagnetic radiation like light, radio waves and microwaves. Similar to X-rays, but usually more powerful, they have no mass; they are only energy. Gamma rays are best stopped or shielded against by dense material such as concrete or lead.

Geiger-Mueller (G-M) detector: a type of radiation detector that can be used to measure the gamma, or beta plus gamma radiation depending on whether the detector is covered by a beta shield.

General Emergency (GE): licensee emergency classification level indicating that events are in process or have occurred that involve actual or imminent substantial core degradation or melting, with potential for loss of containment integrity or security events that result in an actual loss of physical control of the facility. Releases can reasonably be expected to exceed Environmental Protection Agency protective action guide exposure levels offsite for more than the immediate site area.

Groundshine: gamma and/or beta radiation from radioactive material deposited on the ground.

Half-life: the time required for the activity of a given radioactive substance to decrease to half of its initial value due to radioactive decay. The half-life is a characteristic property of each radioactive species and is independent of its amount or condition. The effective half-life of a given isotope on the body is the time in which the quantity in the body will decrease to half as a result of both radioactive decay and biological elimination. Half-lives vary from millionths of a second to billions of years.

Health physics: the science of recognizing, evaluating and controlling health hazards from ionizing radiation.

Health physics technician (HPT): an individual trained in radiation protection.

High exposure rate: an exposure rate greater than 2.5 milliroentgens per hour.

High levels of radiation exposure: doses of 100 rem or greater.

High-level waste: materials from nuclear operations that are no longer useful and have radioactivity concentrations of hundreds to thousands of curies per gallon or cubic foot.

Homeland Security Exercise Evaluation Program (HSEEP): a capabilities- and performance-based exercise program that provides standardized policy, doctrine, and terminology for the design, development, conduct, and evaluation of homeland security exercises. HSEEP also provides tools and resources to facilitate the management of self-sustaining homeland security exercise programs.

Homeland Security Presidential Directive-5 (HSPD-5): an Executive-Branch-issued policy requiring the Department of Homeland Security to coordinate with other Federal departments and agencies, as well as State, local, and Tribal governments to establish the National Response Framework and the National Incident Management System.

Homeland Security Presidential Directive-8 (HSPD-8): an Executive-Branch-issued policy drafted to strengthen the preparedness of the United States to prevent and respond to threatened or actual domestic terrorist attacks, major disasters, and other emergencies by requiring a national domestic all-hazards preparedness goal; establishing mechanisms for improved delivery of Federal preparedness assistance to State and local governments; and outlining actions to improve the capabilities of Federal, State, and local entities. HSPD-8 has been superseded by Presidential Policy Directive-8 (PPD-8).

Host/support jurisdiction: a geographical area that is at least 5 miles, and preferably 10 miles, beyond the boundaries of the 10-mile plume pathway emergency planning zone (i.e., 15-20 miles from the commercial nuclear power plant) where functions such as congregate care, radiological monitoring, decontamination, and registration are conducted.

Host regional office: the FEMA Regional Office that has program jurisdiction for a site because of the location of a commercial nuclear power plant within its regional borders.

Hostile action: as defined in Nuclear Regulatory Commission Bulletin 2005-02, *Emergency Preparedness and Response Actions for Security-Based Events*, a hostile action is "an act toward a nuclear power plant or its personnel that includes the use of violent force to destroy equipment, take hostages, and/or intimidate the licensee to achieve an end. This includes attack by air, land, or water using guns, explosives, projectiles, vehicles, or other devices used to deliver destructive force."

Hot spot: region in a contaminated area in which the level of radioactive contamination is considerably greater than in neighboring regions.

Hot wash: a facilitated discussion held immediately following an exercise among exercise players from each functional area. It is designed to capture feedback about any issues, concerns, or proposed improvements players may have about the exercise. The hot wash is an opportunity for players to voice their opinions on the exercise and their own performance. This facilitated meeting allows players to participate in a self-assessment of the exercise play and provides a general assessment of how the entity performed in the exercise. At this time, evaluators can also seek clarification on certain actions and what prompted players to take them. Evaluators take notes during the hot wash and include these observations in their analysis. The hot wash should last no more than 30 minutes.

Implementing procedure: instructions used by personnel that provide a detailed description, including checklists, of the operations that are to be conducted by either a specific group of individuals or a designated position. Implementing procedures are also referred to as standard operating guidelines.

Improvement Plan (IP): for each task, lists the corrective actions that will be taken, the responsible party or agency, and the expected completion date. The IP is included at the end of the After-Action Report.

Inadequate: as used in reviews of radiological emergency response plans/procedures, inadequate means the plan/procedure contents do not meet the intent of a particular NUREG-0654/FEMA-REP-1 Planning Standard and/or Evaluation Criterion.

Incident: an occurrence, natural or man-made, that requires a response to protect life or property. Incidents can include major disasters, emergencies, terrorist attacks, terrorist threats, civil unrest, wildland and urban fires, floods, hazardous materials spills, nuclear accidents, aircraft

accidents, earthquakes, hurricanes, tornadoes, tropical storms, tsunamis, war-related disasters, public health and medical emergencies, and other occurrences requiring an emergency response.

Incident Command Post (ICP): the field location where the primary response functions are coordinated. The ICP may be co-located with other incident facilities.

Incident Command System (ICS): a standardized management tool for meeting the demands of small or large emergency or non-emergency situations.

Ingestion Exposure Pathway Emergency Planning Zone (EPZ): a geographic area, approximately 50 miles in radius surrounding a commercial nuclear power plant, in which it has been estimated that the health and safety of the general public could be adversely affected through the ingestion of water or food which has been contaminated through exposure to radiation primarily from the deposition of radioisotopes after a radiological accident. The duration of such exposures could range in length from hours to months.

Ingestion Pathway exercise: an exercise involving ingestion exposure pathway protective action decision-making and implementation. A State fully participates in the ingestion pathway portion of exercises at least once every 8 years. In States with more than one site, the State rotates this participation from site to site.

Ingestion phase: see "intermediate phase."

Initial Planning Meeting (IPM): typically the first step in the planning process and lays the foundation for the exercise. Its purpose is to gather input from the exercise planning team on the scope; design requirements and conditions (such as assumptions and artificialities); objectives; level of participation; and scenario variables (e.g., location, threat/hazard selection), and Master Scenario Events List. During the IPM, the exercise planning team decides on exercise location, schedule, duration, and other details required to develop exercise documentation.

Injects: events, typically planned through entries on the Master Scenario Events List, that controllers must simulate, including directives, instructions, and decisions. Exercise controllers provide injects to exercise players to drive exercise play towards the achievement of objectives. Injects can be written, oral, televised, and/or transmitted via any means (e.g., fax, phone, e-mail, voice, radio, or sign). See also contextual injects and contingency injects.

Institutionalized individuals: individuals who reside in institutions, such as nursing homes or correctional facilities, who may need to depend on others for assistance with protective actions. Institutionalized individuals may or may not have disabilities and access/functional needs.

Integrated Public Alert and Warning System (IPAWS): a comprehensive, coordinated, integrated system that can be used by authorized public officials to deliver effective alert messages to the American public. IPAWS is the nation's next-generation infrastructure of alert and warning networks and ensures the President can alert and warn the public under any condition. IPAWS will provide Federal, State, territorial, tribal, and local warning authorities the capabilities to alert and warn their communities of all hazards impacting public safety and well-being via multiple communication pathways.

Interagency Radiological Assessment Plan (IRAP): former Federal response plan published in 1965, revised in 1975. Superseded by the Federal Radiological Monitoring Assistance Plan, Federal Radiological Emergency Response Plan, and the National Response Framework.

Intermediate phase: the period beginning after the utility has verified that the release has been terminated. Reliable environmental measurements are available for use as a basis for decisions on additional protective actions. It extends until these additional protective actions are terminated. This phase may overlap the late phase and may last from weeks to many months. The intermediate phase encompasses REP post-plume activities associated with both ingestion and relocation.

Internal radiation: the nuclear radiation resulting from radioactive substances in the body. Some examples are iodine-131 found in the thyroid gland, and strontium-90 and plutonium-239 found in bone.

Iodine (I): an element of the periodic table. Only one stable isotope exists, the rest are radioactive and artificially created. The most common, iodine-131 and iodine-125, are used for medical treatment of the thyroid gland and in research.

Ion: an atom or molecule with a negative or positive electrical charge.

Ionization: the process of adding or removing electrons from atoms or molecules, thereby creating ions. High temperatures, electrical discharges or nuclear radiation can cause ionization.

Ionizing radiation: any radiation that displaces electrons from atoms or molecules, thereby producing icons. Alpha, beta and gamma radiation are examples. Ionizing radiation may damage skin and tissue.

Irradiation: exposure to radiation.

Isotope: nuclides having the same number of protons in their nuclei and the same atomic number, but differing in the number of neutrons and atomic mass number. Some isotopes of a particular element may be radioactive while the others are not.

Joint Information Center (JIC): a central point of contact for all news media at the scene of the incident. News media representatives are kept informed of activities and events via public information officials from all participating Federal, State, and local agencies, which, ideally, are collocated at the JIC.

Joint Information System (JIS): a structure that integrates incident information and public affairs into a cohesive organization designed to provide consistent, coordinated, accurate, accessible, timely, and complete information during a crisis or incident operations. The mission of the joint information system is to provide a structure and system for developing and delivering coordinated interagency messages; developing, recommending, and executing public information plans/procedures and strategies on behalf of the Incident Commander; advising the incident command concerning public affairs issues that could affect a response effort; and controlling rumors and inaccurate information that could undermine public confidence in the emergency response effort.

Just-in-time training: instructions provided to personnel immediately prior to performing the assigned task or function.

Key staff: those emergency personnel, sufficient in numbers and functions, necessary to carry out emergency operations as set forth in the plans/procedures.

KI (potassium iodide): see potassium iodide.

Late phase: the period beginning when recovery action designed to reduce radiation levels in the environment to acceptable levels for unrestricted use are commenced, and ending when all recovery actions have been completed. This period may extend from months to years. REP post-plume activities associated with return and recovery occur during the late phase.

Lead Agency Official (LAO): the designated official on scene from each participating Federal agency authorized to direct that agency's response.

Lessons Learned: knowledge and experience (both positive and negative) derived from observations and historical study of actual operations, training, and exercises. Exercise After-Action Report/Improvement Plans identify lessons learned and highlight best practices, and should be submitted to FEMA for inclusion in the lessons learned /best practices Website, www.llis.gov, which serves as a national network for generating, validating, and disseminating lessons learned and best practices.

Letter of Agreement (LOA): a document executed between two or more parties outlining specific agreements relating to the accomplishment of an action. REP letters of agreement may cover personnel, equipment, or other types of emergency support, and may take the form of letters, contracts, purchase orders, or other procurement mechanisms.

Licensed material: source material, special nuclear material, or by-product material received, possessed, used, or transferred under a general or special license issued by the NRC or a State.

Licensee: the utility or organization that has applied for or has received from the Nuclear Regulatory Commission (1) a license to construct or operate a commercial nuclear power plant, (2) a possession-only license for a commercial nuclear power plant, with the exception of licensees that have received an NRC-approved exemption to 10 CFR § 50.54(q) requirements, (3) an early site permit for a commercial nuclear power plant, (4) a combined construction permit and operating license for a commercial nuclear power plant, or (5) any other NRC license that is now or may become subject to requirements for offsite radiological emergency planning and preparedness activities.

Limited response: response to a request for radiological assistance that involves limited Department of Energy or other agency resources and does not require the formal field management structure.

Local government: the government of a town, city, county, or region at a local level by locally elected politicians.

Logistics Section: as applied to an exercise planning team organized according to ICS principles, the team members providing the supplies, materials, facilities, and services that enable the exercise to function smoothly

without outside interference or disruption. This group consists of two subsections: service and support. The service section provides transportation, barricading, signage, food and drinks, real-life medical capability, and exercise-site perimeter security. The support section provides communications, purchasing, general supplies, very important personnel (VIP)/observer processing, and recruitment/management of actors.

Low-level waste: wastes containing types and concentrations of radioactivity that require little or no shielding against personnel exposure.

Master Scenario Events List (MSEL): a chronological timeline of expected actions and scripted events that controllers inject into exercise play to generate or prompt player activity. It ensures necessary events happen so that all objectives are met. Larger, more complex exercises may also employ a Procedural Flow, which differs from the MSEL in that it only contains expected player actions or events. The MSEL links simulation to action, enhances exercise experience for players, and reflects an incident or activity meant to prompt players to action. Each MSEL record contains a designated scenario time; an event synopsis; the name of the controller responsible for delivering the inject; and, if applicable, special delivery instructions, the task and objective to be demonstrated, the expected action, the intended player, and a note-taking section.

Maximally exposed individual: a hypothetical individual who receives the greatest possible projected dose in the area of highest radiation levels over a specified period of time.

May: The term *may* denotes an option, neither requirement nor recommendation. See also *shall* and *should*.

Measuring: refers to counting to detect radiation levels or determining other parameters, such as the energy of radiation or physical characteristics of samples, such as the volume of an air sample.

Media center: a facility staffed by public information officers from multiple emergency response organizations for the purpose of providing a single designated point of contact with the news media and to facilitate exchange and coordination of information among public information officers from different organizations. This type of facility is also referred to as a Public Information Center, a Joint Information Center, a Public Affairs Center, or an Emergency News Center.

Medical Services Hospital: designated hospitals with staff trained and capable of treating members of the general public who may be injured and/or considered to have substantial radiation related injuries, or who may have been exposed to and contaminated by radioactive materials.

Medical Services Drill: a drill in which offsite response organizations demonstrate the ability of the transportation services and medical facilities to handle a contaminated individual without spreading contamination.

Met: the status of a REP exercise Demonstration Criterion indicating that the participating offsite response organization performed all activities for the criterion to the level required in the Extent-of-Play Agreement, with no Deficiencies or Areas Requiring Corrective Action assessed in the current exercise for that criterion and no unresolved prior Areas Requiring Corrective Action.

Meteorological Unified Dose Assessment Center (MUDAC): an area within or near the facility which houses the personnel responsible for the coordination of radiological monitoring teams, collection of radiological monitoring data, calculation of dose projections and the recommendation of protective actions for the emergency planning zones.

micro: A prefix that divides a basic unit by 1 million. It is represented by the Greek letter "mu" ("μ"). Example: 1 micrometer = 1 μm = 1/1,000,000 meters ($1x10^{-3}$ m).

microcurie (μCi): a one-millionth part of a curie (see curie).

Midterm Planning Meeting (MPM): an operations-based exercise planning meeting used to discuss exercise organization and staffing concepts; scenario and timeline development; and scheduling, logistics, and administrative requirements. It is also a session to review draft documentation (e.g., scenario, Exercise Plan, Controller/Evaluator Handbook, Master Scenario Events List).

Milestone: a date at which FEMA recommends that a specified task in the planning, development, conduct, and documentation of exercises be completed. Milestones are measured by the number of calendar days before or after the date of a REP exercise. Some milestones are dictated by regulations.

milli: A prefix that divides a basic unit by one thousand. It is represented by the Greek letter "m." Example: 1 millimeter = 1 mm = 1/1,000 meters (10^{-3} m).

millicurie (mCi): a one-thousandth part of a curie (see curie).

millirem (mrem): a one-thousandth part of a rem (see rem).

milliroentgen (mR): a one-thousandth part of a roentgen (see roentgen).

mrem/yr: amount of radiation received in l year (see rem).

Mobility impaired: those without transportation, including those without their own cars, those who are unable to drive and those who need assistance, any of whom will need transportation assistance to evacuate.

Mobilized organization: an organization that has completed the activation process and is able to carry out the essential emergency functions, as required by scenario events and as set forth in emergency response plans/procedures.

Monitoring: the act of detecting the presence of radiation and the measurement of radiation levels, usually with a portable survey instrument.

Monitoring and decontamination facility: a temporary facility established outside the plume emergency planning zone for the purpose of monitoring and decontaminating emergency workers and their vehicles and equipment used in the plume and/or areas contaminated by the plume.

Multi-Year Training and Exercise Plan (TEP): the foundational document guiding a successful exercise program. The multi-year plan provides a mechanism for long-term coordination of training and exercise activities toward an entity's preparedness goals. This plan describes the program's training and exercise priorities and associated capabilities, and aids in employing the building-block approach for training and exercise activities. Within the Multi-Year TEP, the multi-year schedule graphically illustrates training and exercise activities that support the identified priorities. The schedule is color-coded by priority and presents a multi-year outlook for task and priority achievement. As training and exercises are completed, the document can be annually updated, modified, and revised to reflect changes to the priorities and new capabilities that need to be assessed. The Multi-year TEP and schedule are produced through the work completed at the Training and Exercise Planning Workshop (TEPW). The TEPW focuses on discussion of capabilities-based planning, overview of the National Priorities, review of the entity's priorities, and analysis of previous training and exercises. After this information is synthesized, participants develop the plan and schedule for their entity.

nano: a prefix that divides a basic unit by one billion (10^9). It is represented by the Greek letter "n." Example: 1 nanocurie = 1 nCi = 1/1,000,000,000 Ci ($1x10^{-9}$ Ci)

nanocurie (nCi): one-billionth part of a curie (see curie).

Narrative: a body of text, prepared by the exercise evaluator, to describe an organization's performance under the Demonstration Criterion and document in narrative form the events that transpired during the exercise. The narrative also identifies and describes pertinent exercise issues (Deficiencies, Areas Requiring Corrective Action, or Plan Issues), and recommends appropriate corrective actions for each issue identified by the evaluator.

National Atmospheric Release Advisory Center (NARAC): a Department of Energy asset capable of providing a computer-generated model of the most probable path of the radioactive contamination released at a radiological accident site.

National Exercise Schedule (NEXS): a compilation of all national-level, Federal, State, and local exercises. The National Exercise Schedule provides basic information on each planned exercise including the exercise name, location, date, major participants, and points of contact. It also serves as a management tool and reference document for exercise planning and enables exercise visibility to planners and leadership.

National Incident Management System (NIMS): a set of principles that provides a systematic, proactive approach to guide departments and agencies at all levels of government, nongovernmental organizations, and the private sector to work seamlessly to prevent, protect against, respond to, recover from, and mitigate the effects of incidents, regardless of cause, size, location, or complexity, in order to reduce the loss of life and property and harm to the environment.

Neutron: an uncharged particle found in the nucleus of every atom heavier than hydrogen. Neutrons sustain the fission chain reaction in a reactor.

Noble gases: the chemically inert radioactive gases that are released during an accident at a nuclear power plant.

Non-participating organizations: offsite response organizations that are not participating in emergency planning and preparedness for incidents at a commercial nuclear power plant.

Not Demonstrated: term applied to the status of a REP exercise Demonstration Criterion indicating that, for a justifiable reason, the jurisdiction or functional entity did not perform activities under the Demonstration Criterion as specified in the Extent-of-Play Agreement or at the frequency required in the FEMA REP Program Manual. In general, an organization may justify not demonstrating a criterion because of (1) the offsite response organization's response to a real-life emergency during the time that the exercise was being conducted or (2) extenuating circumstances, such as a fire, flood, or other emergency, at the facility that was to be demonstrated.

Notification: distributing an instructional message, either through the EAS or some other system.

Notification and mobilization of personnel: the transmission of messages to emergency personnel informing them of an incident and directing them to report for emergency duty at their assigned duty stations.

Notification of Unusual Event (NOUE): licensee emergency classification level indicating that unusual events are in process or have occurred that indicate a potential degradation in the level of plant safety or indicate a security threat to facility protection. No releases of radioactive material requiring offsite response or monitoring are expected, unless further degradation of safety systems occurs.

Notifying the public: distributing an instructional message, either through the Emergency Alert System or some other system.

Nuclear Weapon Accident Response Procedures (NARP) Manual: Department of Defense and Defense Nuclear Agency Manual.

Nuclear radiation: the particulate and electromagnetic radiation emitted from atomic nuclei in various nuclear processes. The important types of nuclear radiation (from the weapons standpoint) are alpha and beta particles, gamma rays and neutrons. All nuclear radiations are ionizing radiations, but the reverse is not true.

Nucleus: the dense, central, positively charged core of an atom. All nuclei contain protons and neutrons except the nucleus of hydrogen, which has a single proton.

Nuclide: a general term referring to all known isotopes, both stable (279) and unstable (about 5,000), of the chemical elements.

NUREG: a Nuclear Regulatory Commission (NRC) nuclear regulatory publication.

Objective: formerly, one of the 33 areas of ORO capability defined in FEMA-REP-14 and FEMA-REP15 that are evaluated during a REP exercise. Objectives have been replaced by the Assessment Areas and associated Sub-elements and Demonstration Criteria.

Observer: observers do not directly participate in the exercise; rather, they observe selected segments of the exercise as it unfolds, while remaining separated from player activities. Observers view the exercise from a designated observation area and are asked to remain within the observation area during the exercise. A dedicated group of exercise controllers should be assigned to manage these groups.

Offsite: beyond the boundaries of the owner-controlled area around a commercial nuclear power plant.

Offsite Response Organization (ORO): any State, local, and Tribal government; supporting private industry and voluntary organizations; and Licensee offsite response organizations (that are formed when State, local, and Tribal governments fail to participate in the REP Program) that are responsible for carrying out emergency functions during a radiological emergency.

On-scene: the area surrounding a site that is, or potentially could be, impacted by an incident. This area includes both onsite and offsite areas.

Onsite: the owner-controlled area of a commercial nuclear power plant.

Onsite personnel: Licensee or contract personnel working at commercial nuclear power plants.

Operational: status of a facility (e.g., emergency operations center, emergency operations facility, media center, assistance center, emergency worker center, laboratory, etc.) when all key decision makers, as identified in plans/procedures, are at their duty stations and capable of performing all emergency functions assigned to that facility.

Operationally mobilized organization: an organization that has completed the activation process required by events and their emergency response plans/procedures. Operational mobilization is achieved when all key personnel are at their duty stations.

Operations Section: as applied to an exercise planning team organized according to ICS principles, the team members providing most of the technical or functional expertise for the participating entities. This group develops scenarios, selects evaluation tools, and has personnel with the expertise necessary to serve as evaluators.

Out of sequence demonstration: demonstration of criteria not conducted in conjunction with the scenario timeline. For the purposes of demonstrating required criteria, activities conducted during the exercise week may be considered in-sequence as negotiated as part of the Extent-of-Play Agreement.

Partial Participation Exercise: as set forth in 44 CFR 350.2(k), the engagement of State, local, and Tribal personnel in an exercise sufficient to adequately test direction and control functions for protective action decision-making related to the emergency action levels and communication capabilities among affected offsite response organizations and the licensee.

Participants: players, controllers, evaluators, and staff involved in conducting an exercise.

Particulate radiation: radiation in the form of particles (e.g., neutrons, electrons, alpha and beta particles) as opposed to electromagnetic radiation.

Persons with disabilities and access/functional needs: individual(s) within a community that may have additional needs before, during, and after an incident in one or more of the following functional areas: maintaining independence, communication, transportation, supervision, and medical care. Individual(s) in need of additional response assistance may include those who have disabilities (sensory, motor skills, mental/emotional); who live in institutionalized settings; who are elderly; who are children; who are from diverse cultures; who have limited or no English-speaking proficiency; or who are transportation-disadvantaged.

pico: a prefix that divides a basic unit by one trillion (10^{-12}). It is represented by the letter "p." For example, 1 picocurie = 1 pCi = 1/1,000,000,000,000 Ci ($1x10^{-12}$ Ci).

picocurie (pCi): one-trillionth part of a curie (see curie).

Plan Issue: an identified inadequacy in the organization's emergency plan/procedures, rather than in the organization's performance. Plan Issues are required to be corrected through the revision of the appropriate plans/procedures during the next annual plan review and update, submitted for FEMA review, and reported in the State's Annual Letter of Certification.

Planning Area: a pre-designated geographic subdivision of the plume exposure pathway EPZ. In some plans/procedures, it may be referred to as an Emergency Response Planning Area or an equivalent term.

Planning Meetings: the exercise planning team holds planning meetings as forums to design and develop exercises. The scope, type, and complexity of an exercise determines the number of meetings necessary to successfully conduct an exercise. These milestones of the exercise planning process are typically comprised of the Initial Planning Meeting (IPM), the Midterm Planning Meeting (MPM), and the Final Planning Meeting (FPM).

Planning Section: as applied to an exercise planning team organized according to ICS principles, the team members responsible for compiling and developing all exercise documentation. To accomplish this effectively, the Planning Section also collects and reviews policies, plans, and procedures that will be validated during the exercise. During the exercise, the Planning Section may be responsible for developing simulated actions by agencies not participating in the exercise and setting up a Simulation Cell for exercises that necessitate one (such as Functional Exercises).

Plans/Procedures: an organization's documented concept of operations and implementing procedures for managing its internal response to emergencies and coordinating its external response with other organizations. The term *plans/procedures* as used in this manual includes radiological emergency preparedness/response plans, associated implementing procedures such as Standard Operating Guides, and other supporting and referenced materials, all of which are subject to review. The generic term *plans/procedures* is used specifically for flexibility. Procedures may be either incorporated in the main plans or into separate procedural documents at the discretion of the offsite response organization.

Player: players have an active role in preventing, responding to, or recovering from the risks and hazards presented in the exercise scenario, by either discussing (in a discussion-based exercise) or performing (in an operations-based exercise) their regular roles and responsibilities. Players initiate actions that will respond to and/or mitigate the simulated emergency.

Plume: generally a gaseous atmospheric release from a nuclear power plant, in an accident or emergency, which may contain radioactive noble gases and volatile solids. While emergency plans/procedures must recognize the very low probability that particulates could be released in a serious accident, primary emphasis is given to the development of protective actions against the release of noble gases and volatiles such as radioiodines. This cloud is not visible to the eye, but can be measured, or "seen" with radiation measurement equipment.

Plume phase: see "early phase."

Plume dose projections: estimates of dosage to the public from exposure to the plume, over a period of time, in the absence of any protective actions.

Plume Exposure Pathway: (1) For planning purposes, the area within approximately a 10-mile radius of a commercial nuclear power plant site. (2) A term describing the means by which whole body radiation exposures occur as a result of immersion in a plume release. The area in which plume exposures are likely is described in NUREG-0396 as an area extending out approximately 10 miles from the reactor site and forming roughly a "keyhole" shape, with the keyhole oriented downwind. In the plume emergency planning zone, actions may be required to protect the public from the effects of whole-body external exposure to gamma radiation from the plume and from deposited materials and inhalation exposure from the passing radioactive plume's released materials. The duration of exposure in this mode could range from hours to days in the case of particulate deposition.

Plume Exposure Pathway Emergency Planning Zone: a geographic area approximately 10 miles in radius surrounding a commercial nuclear power plant within which the health and safety of the general public could be adversely affected by direct whole body external exposure to gamma radiation from deposited materials as well as inhalation exposure from the passing radioactive plume during a radiological accident. The duration of such exposures could range in length from hours to days.

Plutonium (Pu): an element of the periodic table that is an artificially-produced fissile material. The Pu-239 isotope is used primarily in nuclear weapons.

Population dose projection: projection made by a Federal agency under the Federal Radiological Monitoring and Assistance Plan pertaining to the levels of radiation to which the population within the emergency planning zone will be exposed.

Portal monitor: a radiation monitor consisting of several radiation detectors arranged in a fixed position within a frame that forms a passageway for individuals being monitored.

Post-emergency phase: the Environmental Protection Agency term for the period beginning after the utility determines that the release has terminated, and the responsible offsite response organization determines that public safety is ensured by appropriate protective actions in accordance with applicable protective action guides and that valuable property has been protected. See also "post-plume phase."

Post-plume phase: includes REP activities (ingestion, relocation, reentry, and return) that occur after a release has been terminated. These activities can be demonstrated in an exercise with the plume phase or separately.

Potassium-40 (K-40): a naturally occurring radioactive isotope of potassium, which is an element of the periodic table. It is a beta and gamma emitter and has an exceedingly long half-life. The average person receives about 20 millirems a year from the K-40 in his/her body.

Potassium iodide (KI): a prophylactic compound commonly referred to as a radioprotective drug containing a stable (i.e., non-radioactive) form of iodide that can be used effectively to block the uptake of radioactive iodine by the thyroid gland in a human being.

Potential dose: the radiation dose that could result from a particular set of plant conditions, not based on estimated or measured releases or environmental levels.

Precautionary protective actions: any preventive or emergency protective actions implemented without the verification of radionuclide measurements by field monitoring or laboratory analysis.

Pre-operational exercise: an exercise conducted prior to the issuance of a full-power license of a commercial nuclear power plant by the Nuclear Regulatory Commission.

Presidential Policy Directive-8 (PPD-8): On March 30, 2011, PPD-8 on National Preparedness was signed. This directive replaces Homeland Security Presidential Directive (HSPD)-8 (National Preparedness), issued December 17, 2003, and HSPD-8 Annex I (National Planning), issued December 4, 2007, which are hereby rescinded, except for paragraph 44 of HSPD-8 Annex I. Individual plans

developed under HSPD-8 and Annex I remain in effect until rescinded or otherwise replaced.

Pressure vessel: a strong-walled container housing the core of most types of power reactors.

Pressurized water reactor (PWR): a power reactor in which heat is transferred from the core to the heat exchanger by water kept under high pressure. The primary system is pressurized to allow the water to reach high temperatures without boiling. Steam is generated in a secondary circuit.

Preventive protective actions: protective actions to prevent or reduce contamination of milk, food, and drinking water such as covering water sources and providing dairy cows with stored feed. Preventive protective actions also include washing, brushing, scrubbing, or peeling fruits and vegetables to remove surface contamination.

Primary coolant: water used to cool and carry heat away from the core of a pressurized water reactor. Heat is transferred from the primary coolant to a secondary loop using a heat exchanger, producing steam to drive the turbine.

Principal Federal Official (PFO): pursuant to the Homeland Security Act of 2002 and HSPD-5, the Secretary of Homeland Security is the principal Federal official for all domestic incidents requiring multiagency Federal response. The Secretary may elect to designate a single individual to serve as his or her primary representative to ensure consistency of Federal support as well as the overall effectiveness of the Federal incident management. When appointed, such an individual serves in the field as the Principal Federal Official for the incident.

Projected dose: the estimated or calculated amount of radiation dose to an individual from exposure to the plume and/or deposited materials, over a period of time, in the absence of protective action.

Protective Action Decision (PAD): measures taken in anticipation of, or in response to, a release of radioactive material to the environment. The purpose of PADs is to provide dose savings by avoiding or minimizing the radiation exposure received by individuals, thereby minimizing the health risks resulting from radiation exposure. Sheltering and evacuation are the two PADs relied upon for limiting the direct exposure of the general public within the plume exposure emergency planning zone. Preventive and emergency PADs are two categories of PADs relied upon for limiting exposure from contaminated food and water in the ingestion exposure emergency planning zone.

Protective Action Guide (PAG): projected dose to an individual in the general population that warrants the implementation of protective action. The Food and Drug Administration and Environmental Protection Agency have recommended specific protective action guides in terms of the level of projected dose that warrants the implementation of evacuation and sheltering, relocation, and limiting the use of contaminated food, water, or animal feed.

Protective Action Recommendation (PAR): advice to the State on emergency measures it should consider in determining action for the public to take to avoid or reduce their exposure to radiation.

Protective response: implementation of a protective action, including authority to request Federal assistance and to initiate other protective actions.

Proton: a positively charged atomic particle. Protons, along with neutrons, are the prime components of atomic nuclei. The atomic number of an atom is equal to the number of protons in its nucleus.

Public instruction: instructions (warning messages) that are protective action recommendations for the public. Instructions are given by a public official and delivered directly to the public via the notification system (i.e., Emergency Alert System radio). Message content and timeliness are very important. Messages are repeated by the notification system at least every 15 minutes until updated by public authorities. If applicable, public instructions are coordinated with other authorities.

Public information: information delivered to the media via press conferences, interviews, technical briefings, printed media releases, and telephonic distribution of printed releases. Information needs to be current, accurate, and timely. All printed releases are coordinated with other authorities before distribution to the media. Ideally, information released in news conferences, briefings, and interviews is coordinated before release. If pre-coordination does not occur, then post-notification of other authorities of critical points discussed in interviews, conferences, etc., is necessary.

rad: radiation absorbed dose, the basic unit of absorbed dose radiation. One rad represents the absorption of 100 ergs of nuclear (or ionizing) radiation per gram of the absorbing material or tissue (see roentgen).

Radiation Safety Officer: a health physicist or other individual experienced in radiation protection who advises medical facility staff regarding the hazards associated with high levels of radiation.

Radiation sickness: the complex of symptoms characterizing the disease known as radiation injury, resulting from excessive exposure of the whole body (or large part) to ionizing radiation.

Radioactivity: the spontaneous decay or disintegration of an unstable atomic nucleus, usually accompanied by the emission of ionizing radiation, generally alpha or beta particles, often accompanied by gamma rays from the nuclei of an unstable isotope.

Radioisotope: an unstable isotope of an element that decays or disintegrates spontaneously, emitting radiation. Approximately 5000 natural and artificial radioisotopes have been identified.

Radiological Assistance Program (RAP) team: a team dispatched to the site of a radiological incident by the Department of energy Regional Office responding to the incident.

Radiological emergency: a type of radiological incident that poses an actual or potential hazard to public health or safety or loss of property.

Radiological emergency area: an area established either on an ad hoc basis or pre-identified in a medical facility for monitoring, decontamination, and treatment of contaminated injured individuals, and for contamination control.

Radiological Emergency Preparedness (REP) Exercise: an event involving organizational responses to a simulated commercial nuclear power plant incident with radiological and other offsite consequences. The purpose of an exercise is to test the integrated capabilities of involved offsite response organizations to implement emergency functions set forth in offsite response organization radiological emergency response plans/procedures.

Radiological Emergency Response Plan (RERP): a detailed plan that describes and coordinates the emergency response organizations, responsibilities, and capabilities of utilities, offsite response organizations, and private organizations to ensure public health and safety during an incident in which there is a potential for radiological release.

Radiological Emergency Preparedness (REP) Program: the FEMA program that administers emergency preparedness for all commercial nuclear sites.

Radiological Emergency Response Team (RERT): a team located near the affected area that coordinates all field teams and sampling activities.

Radiological survey: the directed effort to determine the distribution of radiological material and dose rates in an area.

Radiology: that branch of medicine dealing with the diagnostic and therapeutic applications of radiant energy, including x-rays and radioisotopes.

Radionuclide: a radioactive isotope of a particular element.

Range of Reading Sticker: indicates the acceptable range of readings that the meter indicates when it is response checked using a standard test source. If the response check results in readings that fall outside of the range specified on the sticker, the instrument is removed from service and not used for recording activity levels.

Rapidly-escalating incident: an incident that develops potential or actual severe core damage within a short time. Such an incident results in an initial declaration of or rapid escalation (within 30 minutes) to a Site Area Emergency or General Emergency.

Reasonable Assurance: a determination that State, local, Tribal, and utility offsite plans and preparedness are adequate to protect public health and safety in the emergency planning areas of commercial nuclear power plants.

Reasonable time: (usage specific to backup alert and notification of the public) the responsible offsite response organization personnel/representatives demonstrate appropriate actions with a recommended goal of 45 minutes, taking into account but not limited to the effects of weather, topography, population density, and existing organization resources.

Reception center (RC): see Reception/relocation center.

Reception/relocation center (RC): a pre-designated facility located outside the plume exposure pathway emergency planning zone (at a minimum 15 miles from the nuclear power plant) at which the evacuated public can register; receive radiation monitoring and decontamination; receive assistance in contacting others; receive directions to congregate care centers; reunite with others; and receive general information. It generally refers to a facility where

monitoring, decontamination, and registration of evacuees are conducted. A reception/relocation center is also referred to as a registration center or public registration and decontamination center.

Recommendation(s): as used in the Homeland Security Exercise Evaluation Program, the identification of areas for improvement as noted during an exercise and listed in all After-Action Report/Improvement Plans.

Recommended: (as used in this document) a Federally-approved approach for meeting the intent of regulatory requirements.

Recovery: the process of reducing radiation exposure rates and concentrations of radioactive material in the environment to acceptable levels for return by the general public for unconditional occupancy or use after the emergency phase of a radiological emergency.

Recovery plan: a plan developed by the State to restore the affected area with Federal assistance if needed.

Recovery worker: an individual who is permitted to enter the restricted zone under controlled conditions to perform work or to retrieve valuable property.

Reentry: the provisions for the return of the public after evacuation, when the radiation risk has been reduced to acceptable levels.

Reentry recommendation: advice provided to the State by the Cognizant Federal Agency in conjunction with the Senior Federal Official and appropriate Federal departments and agencies concerning offsite response organization guidance or recommendations that may be issued to the public for returning to an area affected by a radiological emergency.

Regional Office Support Team (ROST): a FEMA Regional team that supports the Emergency Response Team. The Regional Office Support Team facilitates deployment of the Emergency Response Team; interfaces with the Emergency Support Team at FEMA Headquarters, with other regional departments or agencies, and with State, local, or Tribal agencies and organizations during deployment; provides regional support during deployment; and assists with recall of the Emergency Response Team.

Regional Radiological Assistance Committee (RAC): a committee of representatives from a number of Federal agencies which have agreed to assist the FEMA Region in providing technical assistance to offsite response organizations and to evaluate radiological emergency response plans/procedures and exercises on the basis of their special authorities, missions, and expertise.

Regional Response Force (RRF): force identified in the Nuclear Accident Response Capabilities Listing (at the Joint Nuclear Accident Coordinating Center) belonging to Department of Defense or Department of Energy installations, facilities, or activities within the US and its territories. The Regional Response Force may be tasked with taking emergency response actions necessary to maintain command and control onsite pending arrival of the Service or Agency Response Force. Functions with which the Regional Response Force may be tasked, within its capabilities, are: (1) rescue operations; (2) accident site security; (3) firefighting; (4) initial weapon emergency safing; (5) radiation monitoring; (6) establishing command, control and communications; and (7) public affairs activities.

Release: escape of radioactive materials into the environment.

Relocation: the removal or continued exclusion of people (households) from contaminated areas to avoid chronic radiation exposure.

Relocation center (RC): see Reception/relocation center.

rem: The unit of dose of any ionizing radiation that produces the same biological effect as a unit of absorbed dose of ordinary x-rays. A unit of dose for measuring the amount of ionizing radiation energy absorbed in biological tissue.

Remedial exercise: an exercise that tests deficiencies of a previous joint exercise that are considered significant enough to potentially impact the public health and safety. A remedial exercise is conducted within 120 days after the biennial REP exercise for the purpose of demonstrating remedial actions to correct one or more deficiencies.

Remote and low-population areas: The ANS must possess the capability for providing both an alert signal and an information or instructional message to the population on an area wide basis throughout the 10 mile EPZ within 15 minutes. The initial notification system will assure direct coverage of essentially 100% of the population within 5 miles of the site. ANS designers must consider all areas, including open water, parks, and other remote portions of the 10-mile EPZ. However, in rural, low-population areas in the 10-mile EPZ that are at least five miles from the NPP, FEMA may allow up to 45 minutes for providing an alert signal to the permanent and transient populations. FEMA

will review these "exception areas" for approval on a case-by-case basis.

REP Branch Chief: FEMA Headquarters individual responsible for implementation of the national Radiological Emergency Preparedness Program.

Residual contamination: contamination that remains after steps have been taken to remove it. These steps may consist of nothing more than allowing the contamination to decay naturally.

Responsible offsite response organization (responsible ORO): an organization designated in emergency response plans/procedures as that organization responsible for a specific emergency function.

Responsible school official: the school official participating in an exercise or drill, who is responsible for implementing school emergency procedures according to the plan.

Restricted zone: an area of controlled access from which the population has been evacuated, relocated or sheltered-in-place.

Return: reoccupation of areas cleared for unrestricted residence/use by previously evacuated or relocated populations.

roentgen (r): a unit of exposure of gamma (or X-ray) radiation in field dosimetry. One roentgen is essentially equal to one rad (see "rad"). A unit for measuring the amount of radiation energy imparted to a volume of air. The roentgen can be used only to measure X-rays or gamma rays.

roentgen equivalent man/mammal (rem): one rem is the quantity of ionizing radiation of any type which, when absorbed by man or other mammals, produces a physiological effect equivalent to that produced by the absorption of 1 roentgen of X-ray or gamma radiation.

Rumors: information circulated by individuals and organizations during an emergency that may or may not be true. (Usually, rumors originate and are spread on an ad hoc, not official basis.)

Sampling: collecting specimens of materials (e.g., particles or radioiodine in the air, animal feed, vegetation, water, soil, or milk) at field locations.

Scenarios: time-based simulations of emergency incidents postulated to allow the demonstration of response capabilities.

Schools: in the context of the REP Program, the term "schools" refers to public and private schools, and licensed or government supported preschools and day cares.

Scram (Safety Control Rod Axe Man): the sudden shutdown of a nuclear reactor, usually by rapid insertion of the control rods. Emergencies or deviations from normal reactor operation cause the reactor to automatically scram.

Senior FEMA Official (SFO): official appointed by the director of FEMA, or his representative, to direct the FEMA response at the scene of a radiological emergency.

Service animal: dogs that are individually trained to do work or perform tasks for people with disabilities. Examples of such work or tasks include guiding people who are blind, alerting people who are deaf, pulling a wheelchair, alerting and protecting a person who is having a seizure, reminding a person with mental illness to take prescribed medications, calming a person with Post Traumatic Stress Disorder (PTSD) during an anxiety attack, or performing other duties. Service animals are working animals, not pets. The work or task a dog has been trained to provide must be directly related to the person's disability. Dogs whose sole function is to provide comfort or emotional support do not qualify as service animals under the ADA.[117]

Shall (Must and Require): mandatory items originating in regulatory material including NUREG-0654/FEMA-REP-1 and the CFR.

Shelter-In-Place: a protective action that includes going indoors listening to an Emergency Alert System radio or television station, closing all windows and doors, closing exterior vents, and turning off heating and air conditioning equipment using outside air.

Shield: material used to reduce or stop radiation.

Should (Suggest and Recommend): guidance outlining a Federally-approved means of meeting the intent of the REP regulations. The term *may* denotes an option, neither requirement nor recommendation.

[117] Department of Justice, Americans with Disabilities Act (ADA), 42 USC 1201 et seq., implementing regulations at 28 CFR § 36.104.

Single Point of Failure (SPOF): A single point of failure (SPOF) is a potential risk posed by the design, implementation, or configuration of a system in which one fault or malfunction causes the entire system to stop operating. It is "critical" when there are no mitigating factors such as back-up or redundant systems.

Site Area Emergency (SAE): licensee emergency classification level indicating that events are in process or have occurred that involve actual or likely major failures in the plant functions needed for protecting the public or security events that result in intentional damage or malicious acts; (1) toward site personnel or equipment that could lead to the likely failure of or; (2) prevents effective access to equipment needed for the protection of the public. Releases are not expected to exceed Environmental Protection Agency protective action guide exposure levels beyond the site boundary.

Special facility: includes schools, licensed day cares, hospitals, nursing homes, certain types of industrial plants that may require a lengthy shutdown period, etc., within the plume emergency planning zone that need to be considered separately from the general population when planning for an incident or accident at a nuclear power plant.

Special nuclear material: by law, includes plutonium, uranium-233, and uranium containing more than the natural concentration of uranium-235.

Spent fuel: nuclear reactor fuel that has been irradiated to the extent that it can no longer effectively sustain a chain reaction.

Standard Operating Guideline (SOG): see implementing procedures

State Coordinating Officer (SCO): an official designated by the governor of an affected State to work with the Cognizant Federal Agency Official and Senior FEMA Official in coordinating the response efforts of Federal, State, local, Tribal, volunteer, and private agencies.

Strontium: a high-energy beta source that can be used as an energy source for satellites, remote weather stations and navigation buoys. Four naturally stable and 12 unstable isotopes of strontium exist. The most common unstable isotope is strontium-90, a product of nuclear fallout that has a half-life of 28 years.

Substantial change: a change in plans/procedures, equipment, or facilities that has a direct effect or impact on emergency response operations. Examples of substantial changes include: changing emergency planning areas, modifying the size or configuration of an emergency operations center, adding more function to a center, or changing the equipment available for use in a center.

Support jurisdiction: see host/support jurisdiction

Survey meter: a portable instrument used in radiological monitoring to detect and measure ionizing radiation.

Tabletop Exercise: a discussion-based exercise that may test single or multiple scenarios and outcomes. OROs may use tabletop exercises to assess key elements in decision-making and implementation.

Thermoluminescent dosimeter (TLD): a type of dosimetry badge used to measure an individual's level of exposure to ionizing radiation. It is characteristic of thermoluminescent material that radiation produces internal changes that cause the material, when subsequently heated, to give off a measurable amount of light directly proportional to the radiation dose. This type of dosimeter cannot be read directly by the wearer; it must be read by a laboratory.

Thyroid exposure: exposure of the thyroid gland to radiation from radioactive isotopes of iodine that have been either inhaled or ingested.

Timeline: the tabular illustration, in an After-Action Report, of the time at which significant events occurred at all participating offsite response organizations in a biennial REP exercise.

Timely (timely manner): the responsible offsite response organization personnel/representatives demonstrate appropriate actions with a sense of urgency and without undue delay.

Total effective dose equivalent (TEDE): the sum of the deep dose equivalent (for external exposures) and for committed effective dose equivalent (for internal exposures).

Traffic control: all activities accomplished for the purpose of facilitating the evacuation of the general public in vehicles along specific routes.

Training and Exercise Plan (TEP): is the foundation document guiding a successful exercise program. The TEP articulates overall exercise program priorities and outlines a schedule of training and exercise activities designed to meet those priorities. The TEP is the result of a Training and Exercise Planning Workshop (TEPW).

Training and Exercise Planning Workshop (TEPW): usually conducted in order to create a Multi-Year Training and Exercise Plan (TEP). During the workshop, participants review priority preparedness capabilities and coordinate exercise and training activities that can improve those capabilities. As a result of the workshop, the Multi-Year TEP outlines multi-year timelines and milestones for execution of specific training and exercise activities.

Transient persons: non-residents. Persons who do not permanently reside in the plume exposure pathway emergency planning zone, but may be present during an emergency.

Transuranic elements: all elements above uranium on the periodic table — those with an atomic number greater than 92. All transuranics are produced artificially and are radioactive.

Trigger/Action levels: is a designated value whereby an individual is directed to perform a specific action. Also, the threshold for contamination levels that trigger the need for decontamination established in the plans/procedures.

Tritium: the one radioactive isotope of hydrogen. A small percentage of natural hydrogen is tritium, but the primary source of tritium is nuclear reactors. It has a half-life of 12 years, but will remain in the body only a few days if taken internally. It is not considered a major health hazard since it is a very weak beta emitter and not harmful unless consumed in very large quantities.

Trusted agent/confidential representative: individuals on the exercise planning team who are trusted to not reveal scenario details to players prior to exercise conduct.

Uranium: an element of the periodic table. There are two primary isotopes: uranium-238, which accounts for 99 percent of all uranium; and uranium-35, the fissionable isotope that sustains the fission reaction in a nuclear reactor.

Vapor: the gaseous form of substances that are normally in liquid or solid form.

Whole-body exposure: an exposure of the body to radiation, in which the entire body rather than an isolated part is irradiated. Where a radioisotope is uniformly distributed throughout the body tissues, rather than being concentrated in certain parts, the irradiation can be considered as a whole-body exposure.

X-ray: a penetrating form of electromagnetic radiation that is used in medical and industrial applications.

Appendix C: REP Guidance References

The following documents inform the REP Program. For a listing of documents that have been retired and/or superseded by the final publication of this edition of the REP Program Manual, see Appendix D.

FEMA-REP SERIES Documents

1. NUREG-0654/FEMA-REP-1, Rev. 1, Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants, Washington D.C., November 1980.

2. NUREG-0654/FEMA-REP-1, Rev.1, Supplement 1, *Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants* – Criteria for Utility Offsite Planning and Preparedness, Final Report, Washington D.C., September 1988.

3. NUREG-0654/FEMA-REP-1, Rev.1, Supplement 2, *Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants* – Criteria for Emergency Planning in an Early Site Permit Application, Draft Report for Comment, Washington D.C., Draft, April 1996.

4. NUREG-0654/FEMA-REP-1, Rev.1, Supplement 3, *Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants – Guidance for Protective Action Strategies*, Washington D.C., October 2011.

5. NUREG-0654/FEMA-REP-1, Rev. 1, Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants, Addenda, Washington D.C., March 2002.

6. NUREG-0654/FEMA-REP-1, Rev.1, Supplement 4, *Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants – Criteria for National Preparedness Initiative Integration, Exercise Enhancement, and Backup Alert and Notification Systems*, October 2011.

7. FEMA-REP-2, *Guidance on Offsite Emergency Radiation Measurement Systems, Phase 1 – Airborne Release*, Washington D.C., June 1990.

8. FEMA-REP-5, Revision 2, Guidance for Developing State, Tribal, and Local Radiological Emergency Response Planning and Preparedness for Transportation Accidents, Washington D.C., November 2000.

9. FEMA-REP-12, Guidance on Offsite Emergency Radiation Measurement Systems, Phase 2 – The Milk Pathway, Washington D.C., September 1987.

10. FEMA-REP-13, Guidance on Offsite Emergency Radiation Measurement Systems, Phase 3 – Water and Non-Dairy Food Pathway, May 1990. (Pre-decisional draft)

11. NUREG-1442, Revision 1/FEMA-REP-17, Revision 1, The *Emergency Response Resources Guide for Nuclear Power Plant Emergencies*, July 1992.

12. FEMA-REP-21, *Contamination Monitoring Standard for a Portal Monitor Used for Radiological Emergency Response*, Washington D.C., March 1995.

13. FEMA-REP-22, *Contamination Monitoring Guidance for Portable Instruments Used for Radiological Emergency Response to Nuclear Power Plant Accidents*, Washington D.C., October 2002.

Other FEMA-REP Guidance Documents

14. FEMA GM-8, Revision 1, RAC *Coordination with Utilities*, October 3, 1983.
15. FEMA GM-21, Revision 1, Acceptance Criteria for Evacuation Plans, February 29, 1984.
16. Federal Register Volume 58, No. 176, p. 47996, Memorandum of Understanding between Federal Emergency Management Agency and Nuclear Regulatory Commission, September 14, 1993.
17. FEMA's REP Program Guidance to State and Local Governments for Shelf-Life Extension of Potassium Iodide (KI), April 12, 2007.
18. Federal Register, Vol. 67, No. 7, pp.1355-1357, Federal Policy on Use of Potassium Iodide (KI), Federal Emergency Management Agency, January 10, 2002.
19. FEMA Comprehensive Preparedness Guide (CPG) 101: Developing and Maintaining Emergency Operations Plans, Version 2.0, November 2010.
20. FEMA Guidance on Planning for Integration of Functional Needs Support Services in General Population Shelters, November 2010.
21. Radiological Emergency Preparedness Exercise Preparation Tool 3.0, 2013.
22. Radiological Emergency Preparedness Program Credentialing Framework, December 2010.

NIMS/NRF Guidance

23. *National Incident Management System*, December 2008.
24. Homeland Security Exercise and Evaluation Program (HSEEP), April 2013.
25. *National Response Framework*, second edition, May 2013.
26. *National Response Framework, ESF#15 – External Affairs Annex*, January 2013.
27. *National Response Framework, Public Affairs Support Annex*, January 2013.
28. *National Response Framework, Nuclear/Radiological Incident Annex*, June 2008.
29. *National Response Framework, Mass Evacuation Incident Annex*, June 2008.

Other Federal Agency Guidance

30. Voting Rights Act of 1965, 42 U.S.C. Part 1973-1973aa-6, as amended.
31. NUREG-75/014, Reactor Safety Study: An Assessment of Accident Risks in the U.S. Commercial Nuclear Power Plants, WASH-1400, October 1975.
32. EPA-400-R-92-001, Manual of Protective Action Guides and Protective Actions for Nuclear Incidents, May 1992.
33. Environmental Protection Agency, Manual of Protective Action Guides and Protective Actions for Nuclear Incidents (Draft for Interim Use and Public Comment), March 2013.
34. Federal Register, Volume 63, No. 156, pp.43402-43403, Accidental Radioactive Contamination of Human Food and Animal Feeds: Recommendations for State and Local Agencies, Food and Drug Administration, August 13, 1998.

35. Federal Register Volume 66, No. 13, pp. 5427-5440, Consideration of Potassium Iodide in Emergency Plans, Final Rule, Nuclear Regulatory Commission, January 19, 2001.

36. Notice from Paul Lohaus (NRC) to All Agreement and Non-agreement States' State Emergency Response Directors dated January 26, 2001 on "Revisions to NRC Regulations on the Use of Potassium Iodide in Emergency Response (STP-01-006)."

37. Federal Register, Volume 66, No. 238, pp.64046-64047, Guidance on Use of Potassium Iodide as a Thyroid Blocking Agent in Radiation Emergencies, Food and Drug Administration, December 11, 2001.

38. Guidance for Federal Agencies and State and Local Governments: Potassium Iodide Tablets Shelf Life Extension, Food and Drug Administration, March 2004.

39. NUMARC/NESP-007, Revision 2 – Methodology for Development of Emergency Action Levels, January 1992.

40. Memorandum from Kay Goss to Regional Directors, dated February 2, 1999, Guidance for Providing Emergency Information and Instructions to the Public for Radiological Emergencies Using the New Emergency Alert System (EAS).

41. Policy Statement on Respiratory Protection, November 22, 1985.

42. FEMA-517 – Basic Guidance for Public Information Officers (PIOs).

43. NUREG/CR7002, Criteria for Development of Evacuation Time Estimate Studies

44. American National Standards Institute, Standard N13.11-2009, Personal Dosimetry Performance Criteria for Testing.

45. Nuclear Regulatory Commission (NRC), Regulatory Issue Summary (RIS) 2002-21, National Guard and Other Emergency Responders Located in the Licensee's Controlled Area, November 8, 2002.

46. The Joint Commission: Hospital, Emergency Management Chapter, Standard EM.02.02.05, July 2012.

47. Occupational Safety Health Act (OSHA), "Best Practices for Hospital-Based First Receivers of Victims from Mass-Casualty Incidents", January 2005.

Appendix D: Historical REP Guidance References

The following documents have been retired and/or superseded by the final publication of this edition of the REP Program Manual.

FEMA-REP Documents

1. FEMA-REP-6, Exercise Evaluation and Simulation Facility Evacuation Events Models: Part I – PREDYN Users Guide, Washington D.C., April 1984.
2. FEMA-REP-7, Exercise Evaluation and Simulation Facility Evacuation Events Models: Part II – User's Manual, Washington D.C., April 1984.
3. FEMA-REP-8, Application of the I-DYNEV System (To Compute Estimates of Evacuation Travel Time at Nuclear Power Stations), Washington D.C., December 1984.
4. FEMA-REP-11, A Guide to Preparing Public Information Materials and Emergency Alert System Instructions for Radiological Emergencies, Washington D.C., Draft, March 1985.
5. Revised Emergency Exercise Frequency Rule, IE Information Notice No. 85-55, July 15, 1985
6. Evacuation: An Assessment of Planning and Research, RR-9, Federal Emergency Management Agency, November 1987.
7. Check List for Review and Evaluation of Emergency Public Information Brochures for Ingestion Pathway Measures, Federal Emergency Management Agency, July 1990.
8. FEMA-REP-14, Radiological Emergency Preparedness Exercise Manual, Washington D.C., September 1991.
9. FEMA-REP-15, Radiological Emergency Preparedness Exercise Evaluation Methodology, Washington D.C., September 1991.
10. FEMA-REP-18, Statements of Consideration for FEMA-REP-14 and FEMA-REP-15, Washington D.C., January 1992.
11. RG REP 05, Rev. 1, REP Evacuation Time Study Review Guide (Checklist), Federal Emergency Management Agency, April 1993.
12. Radiological Emergency Preparedness Program, Standard Exercise Report Format, FEMA, October 1995.
13. Emergency Alert System, Civil Preparedness Guide, 1-40, Federal Emergency Management Agency, Interim Use, June 1996.
14. Emergency Alert System: A Program Guide for State and Local Governments, CPG 1-41, Federal Emergency Management Agency, Interim Use, June 1996.
15. Guide for All-Hazard Emergency Operations Planning, Federal Emergency Management Agency, State and Local Guide (SLG) 101, September 1996.
16. RG REP 01, Rev. 4, REP Emergency Information Materials/Brochures Review Guide, Federal Emergency Management Agency, January 1998.
17. RG REP 04, Rev. 6, Pre-Exercise Activities, January 1998.
18. RG REP 06, Emergency Alerting System, February 1998
19. Initiative 1.2: Reduce Frequency of Evaluation, October 1, 1999.

20. Initiative 1.3: Negotiate the Use of Out-of-Sequence Demonstrations, October 1, 1999.

21. Initiative 1.4: Give Direct Feedback, October 1, 1999.

22. Initiative 1.5: Correct Issues Immediately, October 1, 1999.

23. Initiative 1.7: New Scenario Options, October 1, 1999.

24. Policy Paper on "Evaluation of Emergency Medical Services Drills," approved by Kay Goss, effective October 1, 1999.

25. Federal Register, Volume 66, No. 112, pp. 13142-31362, Radiological Emergency Preparedness: Exercise Evaluation Methodology, June 11, 2001.

26. Federal Register, Volume 66, No. 112, pp. 31362-31363, Radiological Emergency Preparedness: Alert and Notification, June 11, 2001.

27. Federal Register, Volume 66, No. 177, pp. 47546-47548, Radiological Emergency Preparedness: Alert and Notification, September 12, 2001.

28. Federal Register, Volume 67, No. 80, pp. 20580-20602, Radiological Emergency Preparedness: Exercise Evaluation Methodology, April 25, 2002.

29. Initiative 1.6: Expand the use of Exercise Credit, November 30, 2002.

30. Initiative 3.0: Use State, Tribal, and Local Personnel as REP Exercise Evaluators, April 11, 2002.

31. Federal Register, Volume 68, No. 160, pp. 49783-49785, Radiological Emergency Preparedness: Planning and Preparing for a Fast-Breaking Event, August 19, 2003.

FEMA REP Guidance Memoranda

32. GM PI-1, FEMA Action to Pilot Test Guidance on Public Information Materials and Provide Technical Assistance On Its Use, October 2, 1985.

33. GM PR-1, Policy on NUREG-0654/FEMA-REP-1 and 44 CFR Periodic Requirements, October 4, 1985

34. GM FR-1, Federal Response Center, December 3, 1985.

35. GM MS-1, Medical Services, November 13, 1986.

36. GM EV-2, Protective Actions for School Children, November 13, 1986.

37. GM AN-1 and FEMA Action to Qualify Alert and Notification Systems Against NUREG-0654/FEMA-REP-1.

38. GM EX-3, Managing Pre-Exercise Activities and Post-Exercise Meetings, February 26, 1988

39. GM IN-1, The Ingestion Exposure Pathway, February 26, 1988.

FEMA REP Policy and Guidance Clarifications: Memoranda and Letters

40. Memorandum from Louis O. Giuffride to Regional Directors on October 18, 1981 on "Procedural Policy on Radiological Emergency Preparedness."

41. Memorandum from Dave McLoughlin to Regional Directors on December 1, 1982 on "Interim Policy Guidance on Potassium Iodide."

42. Memorandum from Edward Jordan to Richard Krimm on May 9, 1983 on "NRC Position concerning 15 minutes public notification capability."

43. Memorandum from Dave McLoughlin to Regional Directors on August 5, 1983 on "Procedural Policy on Radiological Emergency Preparedness Plan Review, Exercise Observations and Evaluations and Interim Findings."

44. Memorandum from Associate Director, initials DM, to the Director on March 7, 1984 on "Alpha Radiation in Radiological Emergencies."

45. Memorandum from Joseph Mouhaun to Associate Directors of Region I and III on April 2, 1984 Memo on "Radiation Hazards."

46. Memorandum from Robert Wilkerson to R. Dell Greer on April 30, 1985 on "State of Arkansas Questions on Population Exposure."

47. Memorandum from Richard Krimm to Frank Finch dated May 17, 1985, on "Congregate Care Facilities."

48. Memorandum from Robert Wilkerson to Frank Begley on July 15, 1985 on "Five-year Exercise Requirement."

49. Letter from J.M. Keller to Steward Glass dated October 4, 1985 on "Clarification of NUREG-0654 Element J.12."

50. Memorandum from Robert Wilkerson to Richard Leonard on October 23, 1985 "Guidance on Alert and Notification of Transient Populations within the Emergency Planning Zone."

51. Memorandum from Richard Krimm to NTH Division Chiefs, FEMA Regional Offices dated December 24, 1985, on "Guidance on NUREG-0654/FEMA-REP-1 Evaluation Criterion J.12."

52. Memorandum from Samuel Speck to Regional Director of Region IX dated January 28, 1986 on "Section C of Guidance Memorandum (GM) PR-1, Policy on NUREG-0654/FEMA-REP-1 Periodic Requirements."

53. Memorandum from Robert Wilkerson to Roger Kowieski dated February 26, 1986 "State of NJ request for Exception from the 15-minute Alerting Requirement for the Artificial Island (Salem/Hope Creek) Generating Station."

54. Memorandum from Glenn Woodard to Richard Krimm dated March, 18, 1986 on "Clarifications concerning 15-min Public Notification Capability."

55. Memorandum from Samuel Speck to John Coleman dated April 3, 1986 on "Radiological Emergency Preparedness (REP) Policy Issues."

56. Memorandum from Richard Krimm to Glenn Woodard dated April 22, 1986 on "Clarification of the 15-Minute Design Objective for Alert and Notification Systems."

57. Memorandum from Frank Begley to Richard Krimm dated August 6, 1986 on "Clarification of NUREG-0654 Element J.12."

58. Memorandum from Richard Donovan to Robert Wilkerson dated August 19, 1986 on "Exercise Objective 'Total Population Exposure'."

59. Memorandum from Robert Wilkerson to Frank Begley dated September 12, 1986 on "Use of Landmark Descriptions in Public Information Releases."

60. Memorandum from Richard Krimm to Edward Jordan dated December 11, 1986 on "Generic Safety Concerns regarding Alert and Notification Systems."

61. Memorandum from Robert Wilkerson to Frank Begley dated December 23, 1986 on "Mobilization of Emergency Response Personnel."

62. Memorandum from Edward Jordan to Richard Krimm dated February 3, 1987 on "Scaling of Alert and Notification Design Objectives."

63. Memorandum from Dave McLoughlin to Robert Connor and J. D. Overstreet dated February 5, 1987 on "Offsite Planning and Preparedness Issues for the LaCrosse Plant."

64. Memorandum from Richard Krimm to Regional Directors and ONTH Chiefs dated February 5, 1987 on "Annual Letter of Certification (ALC)."

65. Memorandum from Frank Begley to Dave McLoughlin dated March 3, 1987 on "Split Jurisdiction and Emergency Planning Zones in a Radiological Emergency Preparedness Program."

66. Memorandum from Dave McLoughlin to All Regional Directors dated March 17, 1987 on "Split Jurisdictions and Emergency Planning Zones in a Radiological Emergency Preparedness Program."

67. Memorandum from Dave McLoughlin to Jerome Overstreet dated September 8, 1987 on "Comprehensive Cooperative Agreement (CCA) Funding for maintenance and calibration of Radiological Instruments for Peacetime Purposes and Compliance REP Periodic Requirements."

68. Memorandum from Richard Krimm to Frank Begley dated September 23, 1987 on "Alternate Emergency Operations Center (EOC)."

69. Memorandum from Julius Becton Jr. to Regional Directors dated November 4, 1987 on "Policy on Interim and 350 Findings and Determinations."

70. Memorandum from J.D. Overstreet to Julius Becton dated November 20, 1987 on "Radiological Emergency Preparedness Policy on Interim Findings."

71. Memorandum from Richard Krimm to Frank Begley dated December 9, 1987 on "Quad Cities Emergency Planning Zone (EPZ) Boundary Determination (split jurisdiction)."

72. Memorandum from Julius Beckton Jr. to Regional Directors dated December 31, 1987 on "Policy on Interim and 350 Findings and Determinations."

73. Memorandum from Richard Krimm to Frank Begley dated January 5, 1988 on "Radiological Monitoring."

74. Memorandum from Richard Krimm to NTH Division Chiefs dated February 9, 1988 on "Clarification of Selected Provisions of Guidance Memorandum (GM) MS-1, Medical Services."

75. Memorandum from Frank Begley to Richard Krimm on February 16, 1988 on "Evacuation Monitoring -Time established for Personnel monitoring."

76. Memorandum from Frank Begley to Richard Krimm on February 19, 1988 on "Request for Policy Guidance on Peak Transient Populations."

77. Memorandum from Richard Krimm to Frank Begley dated February 26, 1988 on "Annual Letter of Certification."

78. Memorandum from Richard Krimm to Frank Begley dated March 4, 1988 on "Radiological Monitoring."

79. Memorandum from Grant Peterson to Regional Directors dated March 7, 1988 on "Guidelines for Regions to Use in Implementing NUREG-0654/FEMA-REP-1, Rev. 1, Supplement 1, With Qualifying Exercises."

80. Memorandum from Frank Begley to Richard Krimm on March 14, 1988 on Medical Services and RAD Monitoring Guidance."

81. Memorandum from Richard Krimm to Frank Begley dated March 24, 1988 on "Peak Transient Populations."

82. Memorandum from Richard Donovan to Richard Krimm dated April 22, 1988 on "Review and Evaluation of Public Information Material for the Seabrook Plan for Massachusetts Communities."

83. Memorandum from Frank Begley to Richard Krimm dated April 29, 1988 on "Relocation Centers beyond 5 miles of the EPZ."

84. Memorandum from Richard Krimm to Wallace Weaver dated May 03, 1988 on "REP Issues from Region V."

85. Memorandum from Glen Woodard to Region IV (Directors, State Emergency Management Orgs, State Radiological Health Orgs managers, Nuclear Emergency Preparedness (Utilities) Regional Assistance Committee) dated May 9, 1988 on "Medical Services and Drills."

86. Memorandum from Richard Krimm to Richard Donavon dated May 11, 1988 on "Review and Evaluation of Public Information Material for the Seabrook Plan for Massachusetts Communities."

87. Memorandum from Glenn Woodard to Richard Krimm dated June 13, 1988 on "Guidance Memorandum MS-1."

88. Memorandum from Richard Krimm to Edward Thomas dated June 20, 1988 on "Annual Letter of Certification" (includes criteria and references a checklist).

89. Memorandum from Glenn Woodard to Richard Krimm on August 9, 1988 on "FEMA Guidance Memorandum."

90. Memorandum from William Fucik to Craig Wingo on August 11, 1988 on "Revised FEMA Policy to a 2.206 Petition Concerning Receiving Schools around the Perry Nuclear Power Plant."

91. Letter from Leann Diehl to Vern Wingert dated September 2, 1988 on generic ingestion brochure.

92. Memorandum from Richard Krimm to Glen Woodard on September 9, 1988 on "June 13, 1988 Memorandum on Guidance Memorandum MS-1, Medical Services."

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95. Memorandum from Richard Krimm to Frank Begley dated September 22, 1988 on "Interpretation of 'Shall' and 'Should' as used in NUREG-0654/FEMA-REP-1 and Off-Hours Unannounced Drills/Exercises."

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110. Memorandum from Frank Begley to Kenneth V. Miller (Missouri Department of Health) dated March 23, 1990 on "Exercise Demonstration of Two Radiological Monitoring Field Teams."

111. Letter from William H. Spell to Robert Morris dated April 3, 1990 on "funding for RERO training course."

112. Memorandum from Grant Peterson to Regional Directors dated July 31, 1990 on "Scenario criteria for use in Radiological Emergency Preparedness Exercises."

113. Memorandum from Grant Peterson to Regional Directors on August 6, 1990 on Draft GM-RG-1 "Regional Implementation of FEMA's Radiological Emergency Preparedness (REP) Program."

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117. Memorandum from Robert Bissell, Chief/RAC Chairman Tech Hazards Branch, to State Directors on February 12, 1991 on "Draft GM MS-1, Medical Services Revision 1."

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119. Memorandum from Stephen Harrell to Dennis Kwiatkowski on October 7, 1991 on "Resolution of Open Region VII Requests for REP Guidance."

120. Memorandum from Dennis Kwiatkowski to Stephen Harrell dated January 16, 1992 on "Response to Request from Region VII for Resolution of Radiological Emergency Preparedness (REP) Program Issues."

121. Memorandum from Dennis Kwiatkowski to Walter Pierson dated March 26, 1992 on "Response to Region III's Request for Guidance on Ingestion Pathway Exercise Demonstration."

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123. Memorandum from Dennis Kwiatkowski to Robert Adamcik dated January 13, 1993 on "Pennsylvania Emergency Management Agency Request for Clarification of FEMA-REP-14 Dosimetry Requirements Under Objective 5, Emergency Worker Exposure Control."

124. Memorandum from William Wark to Joseph Dominguez dated February 21, 1993 on "Annual Distribution of Emergency Information to the Public."

125. Memorandum from Craig Wingo to Stephen Harrell dated March 5, 1993 on "Response to Policy Clarification on Radiological Emergency Planning for Day Care Centers."

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127. Memorandum from Marlee Carroll to Bob Bissell, Joe Schulte, Norm Valentine, Connie Wisniewski, Jane Young, and Mindy McDaniel dated April 2, 1993 on "REP Procedures Manual Revisions."

128. Memorandum from H. Joseph Flynn (OGC), (FEMA) Associate General Counsel for Program Law, to Richard W. Krimm, dated April 30, 1993 on "Legal Opinion on Letters of Agreement."

129. Memorandum from Richard Krimm to Regional Directors dated October 13, 1993 on "Adequate Demonstration of Objective 16 at Radiological Emergency Preparedness Exercises."

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132. Memorandum from Delbert Kohl to Stuart Rifkind dated May 27, 1994 on "Ingestion Planning – Indiana."

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135. Memorandum from Robert Fletcher to Rita Calvan dated December 12, 1994 on "FEMA Review and Approval Process for the Susquehanna Steam Electric Station Offsite Radiological Emergency Plans and Preparedness."

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137. Memorandum from Robert Fletcher to Charles Biggs dated February 23, 1995 on "Request for Exemption on Back-up Medical Facilities."

138. Memorandum from Robert Fletcher to Charles Biggs dated March 9, 1995 on "EPA Manual of Protective Action Guides and Retrospective Determinations of Total Dose."

139. Memorandum from Kay Goss to Regional Directors dated March 17, 1995 on "Distribution of Portal Monitor Standard Documents."

140. Memorandum from Bill Wark to Larry Bailey dated June 6, 1995 on "Evaluation of Activities at Designated Radio/Television Stations That Broadcast Emergency Messages."

141. Memorandum from Robert Wilkerson to Region II RAC Chair dated April 7, 1995 on "Redundant Route Alerting."

142. Memorandum from William Wark to Joseph Dominguez, dated April 12, 1996 on "Precautionary Evacuation for the Emergency Planning Zone (EPZ) of the Diablo Canyon Site."

143. Memorandum from Vern Wingert to Larry Robertson dated August 21, 1996 on "Dosimeter Guidance for Emergency Workers."

144. Memorandum from Kay Goss to Regional Directors dated June 23, 1997 on "Monitoring of Radiation Exposure by States."

145. Memorandum from Ihor Husar to RAC Chairpersons dated January 14, 1998 on "Mandate of the 'One-Third Rule' for the Remaining Radiological Emergency Preparedness (REP) Exercises Conducted in Fiscal Year 1988."

146. Memorandum from Ihor Husar to Eric Jenkins dated March 5, 1998 on "Review and Determination on the Nebraska Emergency Management Agency's Petition to Delete Nemaha County Hospital From the Nebraska Radiological Emergency Response Plans (Cooper Nuclear Station)."

147. Memorandum from Kay Goss to Regional Directors, dated April 2, 1998 on "Interim-Use Guidance for Providing Information and Instructions to the Public for Radiological Emergencies Using the New Emergency Alert System (EAS)."

148. Memorandum from Ihor Husar to Robert Bissell and RAC Chairs dated July 23, 1999 on "Request for Consensus on the Standard Exercise Report Format (SERF)."

149. Memorandum from Carol Ann Adamcik to Russell Salter dated May 11, 2000 on "Legal Opinion on Contents of Public Notification Messages for Radiological Emergency Preparedness (REP)."

150. Memorandum from Kay Goss to Directors, Regions I, II, III, IV, V, VI, VII, IX, and X dated July 5, 2000 on "Annual Letter of Certification Reporting Requirements Under 44 CFR Part 350 and NUREG-0654/FEMA-REP-1, Revision 1."

151. Memorandum from Vanessa Quinn to Woodie J. Curtis dated July 21, 2000 on "State of Illinois Determination on KI Inventory Potency."

152. Memorandum from Vanessa Quinn to All RAC Chairs dated November 20, 2000 on "Food and Drug Administration (FDA) Guidance on Extending the Shelf-life of Potassium Iodide (KI)."

153. Letter from Richard Meserve to Thomas Ortciger dated November 9, 2001 on "fast-breaking emergencies."

154. Memorandum from Richard Krimm to Warren, undated, on "Granting Credit for Objectives 32 and 33."

155. Letter from J. Witt to R. Meserve, undated, on "NRC Decision to revise regulations to consider use of KI for the public."

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156. Memorandum of Understanding with Transportation Safety Board dated February 27, 1997.

157. Federal Communications Commission Memorandum 98-329, Legal Report and Order "In the Matter of Amendment of Part 73, Subpart G, of the Commission's Rules Regarding the Emergency Broadcast System," released December 23, 1998.

Appendix E: List of Commercial Nuclear Power Plants

The following list of commercial nuclear power plant (NPP) sites includes all operating sites as well as proposed sites engaged in the licensing process as of the date of publication of this document. The last two digits of each Utility Billable Plant Site Code are used as the initial part of the standardized exercise issue numbering system. For more information on individual NPP sites, see the NRC web site at www.nrc.gov.

Site Code	Site Name	Number of Units	Location
24 001	Arkansas Nuclear One	Operating: 2	London, AR
24 002	Salem Nuclear Generating Station/Hope Creek Generating Station(formerly Artificial Island)	Operating: 3	Hancocks Bridge, NJ
24 003	Beaver Valley Power Station	Operating: 2	Shippingsport, PA
24 004	Bellefonte Nuclear Station	Proposed: 2	Jackson County, AL
24 006	Braidwood Station	Operating: 2	Braceville, IL
24 007	Browns Ferry Nuclear Plant	Operating: 3	Athens, AL
24 008	Brunswick Steam Electric Plant	Operating: 2	Southport, NC
24 009	Byron Station	Operating: 2	Byron, IL
24 010	Callaway Plant	Operating: 1 Proposed: 1	Fulton, MO
24 011	Calvert Cliffs Nuclear Power Plant	Operating: 2 Proposed: 1	Lusby, MD
24 012	Catawba Nuclear Station	Operating: 2	York, SC
24 013	Clinton Power Station	Operating: 1	Clinton, IL
24 014	Comanche Peak Nuclear Power Plant	Operating: 2 Proposed: 2	Glen Rose, TX
24 015	Donald C. Cook Nuclear Plant	Operating: 2	Bridgman, MI
24 016	Cooper Station Nuclear Station	Operating: 1	Brownville, NE
24 017	Crystal River Nuclear Generating Plant	Operating: 1	Crystal River, FL
24 018	Davis-Besse Nuclear Power Station	Operating: 1	Oak Harbor, OH
24 019	Diablo Canyon Power Plant	Operating: 2	Avila Beach, CA
24 020	Dresden Nuclear Power Station	Operating: 2	Morris, IL
24 021	Duane Arnold Energy Center	Operating: 1	Palo, IA
24 022	Joseph M. Farley Nuclear Plant	Operating: 2	Columbia, AL
24 023	Fermi	Operating: 1 Proposed: 1	Newport, MI
24 024	James A. FitzPatrick Nuclear Power Plant	Operating: 1	Scriba, NY
24 025	Fort Calhoun Station	Operating: 1	Ft. Calhoun, NE
24 027	R. E. Ginna Nuclear Power Plant	Operating: 1	Ontario, NY
24 028	Grand Gulf Nuclear Station	Operating: 1 Proposed: 1	Port Gibson, MS
24 030	Shearon Harris Nuclear Power Plant	Operating: 1 Proposed: 2	New Hill, NC
24 031	Edwin I. Hatch Nuclear Plant	Operating: 2	Baxley, GA
24 032	Indian Point Nuclear Generating Station	Operating: 2	Buchanan, NY
24 033	Kewaunee Power Station	Operating: 1	Kewaunee, WI

Site Code	Site Name	Number of Units	Location
24 034	LaSalle County Station	Operating: 2	Marseilles, IL
24 035	Limerick Generating Station	Operating: 2	Limerick, PA
24 036	William States Lee III Nuclear Station	Proposed: 2	Cherokee County, SC
24 037	McGuire Nuclear Station	Operating: 2	Huntersville, NC
24 038	Millstone Power Station	Operating: 2	Waterford, CT
24 039	Monticello Nuclear Generating Plant	Operating: 1	Monticello, MN
24 040	Nine Mile Point Nuclear Station	Operating: 2 Proposed: 1	Scriba, NY
24 041	North Anna Power Station	Operating: 2 Proposed: 1	Louisa, VA
24 042	Oconee Nuclear Station	Operating: 3	Seneca, SC
24 043	Oyster Creek Generating Station	Operating: 1	Forked River, NJ
24 044	Palisades Nuclear Plant	Operating: 1	Covert, MI
24 045	Palo Verde Nuclear Generating Station	Operating: 3	Wintersburg, AZ
24 046	Peach Bottom Atomic Power Station	Operating: 2	Delta, PA
24 047	Perry Nuclear Power Plant	Operating: 1	Perry, OH
24 048	Pilgrim Nuclear Power Station	Operating: 1	Plymouth, MA
24 049	Point Beach Nuclear Plant	Operating: 2	Two Rivers, WI
24 050	Prairie Island Nuclear Generating Plant	Operating: 2	Welch, MN
24 051	Quad Cities Nuclear Power Station	Operating: 2	Cordova, IL
24 053	River Bend Station	Operating: 1 Proposed: 1	St. Francisville, LA
24 054	H. B. Robinson Steam Electric Plant	Operating: 1	Hartsville, SC
24 055	St. Lucie Plant	Operating: 2	Jensen Beach, FL
24 056	San Onofre Nuclear Generating Station	Operating: 2	San Clemente, CA
24 057	Seabrook Station	Operating: 1	Seabrook, NH
24 058	Sequoyah Nuclear Plant	Operating: 2	Soddy-Daisy, TN
24 060	South Texas Project	Operating: 2 Proposed: 2	Bay City, TX
24 061	Virgil C. Summer Nuclear Station	Operating: 1 Proposed: 2	Jenkensville, SC
24 062	Surry Power Station	Operating: 2	Surry, VA
24 063	Susquehanna Steam Electric Station	Operating: 2	Luzerne County, PA
24 064	Three Mile Island Nuclear Station	Operating: 1	Middletown, PA
24 066	Turkey Point Nuclear Generating	Operating: 2 Proposed: 2	Homestead, FL
24 067	Vermont Yankee Nuclear Power Station	Operating: 1	Vernon, VT
24 068	Vogtle Electric Generating Plant	Operating: 2 Proposed: 2	Waynesboro, GA
24 069	Columbia Generating Station (Formerly WPSS2)	Operating: 1	Richland, WA
24 070	Waterford Steam Electric Station	Operating: 1	Killona, LA
24 071	Watts Bar Nuclear Plant	Operating: 1	Spring City, TN
24 072	Wolf Creek Generating Station	Operating: 1	Burlington, KS
	Bell Bend Nuclear Power Plant	Proposed: 1	Luzerne County, PA
	Levy County	Proposed: 2	Levy County, FL

Index

"350" approval 8

access control
at emergency operations center 68
at joint information center 62
definition 277
during post-plume phase 186
equipment for 181
implementation 190
in HAB incident 35
in letter of agreement 26
of evacuated areas 100
of restricted areas 97, 124
to contaminated vehicles and equipment 105

access/functional needs
alert and notification considerations 43
definition 277
EAS messages addressing 48
evacuation considerations 90, 98
identification of individuals 57
in public information materials 55, 257
monitoring of service animals 105
precautionary protective actions for 86
protective actions for 185, 189, 217
public information for 199
service animals 7
shelter accessibility 95

accident assessment
definition 277
training of personnel 142

action level. *See* **trigger/action levels**

activation
definition 277
drills 156
exercise credit for 175
implementation 179
of alert and notification system 43, 197
of alternate personnel 35
of communications links 50
of emergency response organization 23
of facilities 69
of field teams 77
of joint information center 61
of letters of agreement 26
of personnel 53
of public inquiry function 65
of transportation resources 91

activity types. *See* **HSEEP: activity types**

After-Action Meeting 155, 174
definition 278

After-Action Report 173, 224
definition 278
issue numbering 172

Alert and Notification System 262
activation 197
administrative procedures 46
annual letter of certification 246, 248, 252
backup systems 44, 198, 218
design objectives 44
equipment 45
Evaluation Report Template 266
exception areas 44, 198
FEMA evaluation of 263
in Public Information Review Guide 258
primary system 44
reasonable time 298
survey 45

alternate communication links 50

alternate communications
system 181

alternate EAS station 197

alternate evacuation routes 94

alternate facility
emergency operations center 68
joint information center 61, 66

alternate notification pathways in HAB incident 40

alternate personnel
activation 179
in HAB incident 35

alternative approaches
approval process 233
to meeting requirements 2

alternative evaluation methods
no/minimal release exercise 165

alternative methods
protective action development 100, 184, 217

alternative systems for alert and notification 45

annual letter of certification
correction of planning issues reported in 175

equipment and supplies reported in 181
exercise results in 139
guidance 246
ingestion information in 133
letters of agreement in 27
media briefing materials in 67
public information materials in 55
requirement for 148
review guide 248
siren test reporting 46
verification during site assistance visit 237

Area Requiring Corrective Action (ARCA)
consideration of in exercise planning 167
correction of 175
correction of during exercise 170
correction of plan/procedure 148
definition 170, 279
discussion in public meeting 169
in After-Action Report 173
issue numbering 171
multiple assessed as Deficiency 171

assessment strategy. *See* **planning and preparedness assessment strategy**

backup alert and notification. *See* **Alert and Notification System: backup systems**

backup notification
of response organization 23, 39

backup route alerting. *See* **Alert and Notification System: backup systems**

calibration
definition 279
demonstration of 182
for medical services monitoring 123
of air sampling equipment 78
of laboratory equipment 196
records to support demonstration credit 176
reporting in annual letter of certification 251
requirements 71
verification in equipment check 79

check source 72, 79, 115, 123, 182
definition 279

Concepts and Objectives Meeting 154, 167
definition 280

congregate care
center locations map 88
clearance to enter 106, 202
definition 281
demonstration of 203
evacuation of students to 190
facilities annual letter of certification 251
in public information materials 57, 259

contamination
control of 106
definition 281
detection. *See* monitoring
in food 102
of animal feed 102

core capabilities 5, 227
definition 282
from the National Preparedness Goal 16

day cares
definition 282
in public information materials 56
in Public Information Review Guide 257
protective actions for 90, 185

decontamination
after reentry 187, 192
collection of waste water 117
definition 282
determining need for 114
during provision of medical services 204
following reentry 124
of emergency workers and equipment 116, 202
of evacuees 201
of pets 7
procedures 105
related to provision of medical services 120, 123
trigger/action levels 105, 116

Deficiency 9, 211
classifying the issue as 170
correction 155, 174
definition 170, 283
discussion in public meeting 169
for criterion not demonstrated 172
in After-Action Report 173
no/minimal release scenario 165
notifying State 172
post-exercise timeline 155
reporting 148
withdrawal of reasonable assurance 213

demonstration requirements matrix 158

Disaster Initiated Review 261

dose calculation 109

dose limits 13, 107, 110, 113, 183
authorizations to exceed 112, 188
definition 283

procedures to exceed 114

dosimetry
annual letter of certification 252
definition 283
during reentry 187, 193
for emergency workers 108, 183, 188
for reentry 125
group use 109, 188
in HAB incident 112
inventory 71, 181
procedures 112, 119, 123
record keeping 111
supply 70
training 140
types 71, 108
verification during site assistance visit 237

early (plume) phase 15, 82, 109, 124
definition 283

Emergency Alert System
as part of alert and notification system 45
definition 284
demonstration 200
evaluations of EAS stations 197
information in Public Information Review Guide 256
in public information materials 56
message requirements 48
non-English message requirements 260
use of 42

Emergency Classification Level 37
definition 284

emergency planning zone
changes to 234
definition 284
description 14

evacuation time estimates 96, 98, 237
definition 285

evaluation frequency for Demonstration Criteria 158

evaluator credentialing 235

exception areas
Alert and Notification System 198
definition 285

exercise credit for actual events 157, 175

exercise cycle
exemption from demonstration 176
ingestion demonstration requirement 133
length 130, 218
requirements during 129, 157
scheduling activities and requirements 155

exercise evaluation guides 167, 227
definition 285

exercise planning team 163
definition 285

exercises
full-scale 156
functional 156
issue numbering 172
tabletop 156

exposure
definition 286
limits. *See* dose limits
pathways 11
public information on effects 66

exposure control
considerations for hostile action incidents 111
emergency workers 108, 113
general public. *See* protective actions
post-plume 124
potassium iodide 92

fast breaker incident. *See* **rapidly escalating incident**

Final Planning Meeting 154
definition 287

foreign-language translation
public information materials 49, 59

full-participation
definition 288
versus full-scale 130, 156

full-scale exercise 156
definition 288

functional exercise 156
definition 288

hostile actions
as scenario variable 131
definition 289
evacuation during 94, 96, 100
exposure control during 111
in exercise planning 164
notification pathways during 40, 51
onsite support during 35
program enhancements to address 6
protective actions during 87, 183
release of sensitive information during 63
use of alternate resources during 35

hot wash 155, 168, 169, 282
definition 289

HSEEP
activity types 155
exercise documents 166
exercise evaluation guides 227
integration with REP 152, 224
planning meetings 167
REP assessment strategy and 2
REP requirements and 6
use in REP exercises 128

ingestion exposure pathway
protective actions 102

ingestion pathway
public information materials for 58

Initial Planning Meeting 154
definition 290

intermediate (ingestion/relocation) phase 13, 15, 82, 124, 126, 192
definition 290

issue correction 174
during an exercise 170

issues
numbering of 172
types 170

KI. *See* **potassium iodide (KI)**

late phase 15, 82, 124, 126
definition 291

media information 66

media inquiries
information in media briefing 66
JIC capability to handle 61

Midterm Planning Meeting 154
definition 292

monitoring
definition 293
drills 136
during medical transport 123
equipment 70, 71, 115, 181
of emergency workers and equipment 108, 202
of evacuees 95, 104, 201
of pets 7
portal monitors 72, 105
procedures 115
re-monitoring after decontamination 116
training 143

National Incident Management System 5
definition 293

National Preparedness Goal 2, 5, 16, 224

National Preparedness System 5

no/minimal release scenario
exercise planning for 165
requirement for 131, 157

pets 7, 277, 300
in public information materials 48, 57

phone survey of alert and notification system 45

plan issue 170
definition 295

planning and preparedness assessment strategy 2, 10, 177
Demonstration Criteria 152
in no/minimal release exercises 165
used in activity types 155

planning meetings
definition 295
milestones table 154

plan review
general guidance 238

potassium iodide (KI)
administration as protective action 12
decision-making guidance 93
definition 296
demonstration requirements 159, 183, 184
effect on TEDE calculation 109
Federal policy and guidance 238
for emergency workers 110, 188
for persons with disabilities and access/functional needs 185
for the general public 13, 189
in hostile action incidents 111
in media information materials 66
in public information materials 56, 259
inventory reporting 157, 181, 237, 252
planning guidance 92
training for emergency workers 140

precautionary actions 86, 99, 102, 186
definition 296
messages for the public 48

protective action guides 12, 82, 86
definition 297

protective actions 11, 38, 84, 87
decision making 99
ingestion exposure pathway 102

in public information materials 56
message for the public 44, 48

public information
considerations for HAB incidents 63
definition 297
EAS messages 48
emergency information 199
foreign-language requirements 49, 59, 260
for the ingestion pathway 58, 60, 192
for transient populations 57, 60
guidance 56
media information 66
officer: roles and responsibilities 62
periodic dissemination 60
review guide 256

public inquiry 48, 64, 65, 200

public meeting
following qualifying exercise 211
for formal 350 approval 206
post-exercise 168, 169

qualifying exercise 9

rapidly escalating incident
definition 298
planning protective actions for 86
requirement for exercises 129, 131, 157
requirements for alert and notification 44
scenario variable 165, 218

reasonable assurance
Deficiency and 170
definition 2, 298
demonstration 166
Disaster Initiated Review and 261
FEMA plan review 8
in regulations 4
ongoing assessment 10
REP-HSEEP integration and 224
role of exercises 130
statement for 350 approval 207
statement in annual letter of certification 247
statement in exercise report 173
withdrawal of 213

reasonable time. *See* **timely manner**
definition 298

registration
evacuees 106, 201
individuals needing assistance in an evacuation 57

release. *See also* **no/minimal release scenario**
definition 299
during exercise play 7, 132
of information 48, 61, 63, 64
protective actions 87, 92, 99
radiological 6, 11, 15

rumor control. *See* **public inquiry**

scenario review
reviewer checklist 242

scenario types 164

scenario variables 164

sensitive information
access/functional needs individuals 57
in hostile action incident 63

service animals 7, 57, 91, 95, 104, 201, 203
definition 7, 300

site code
in issue numbers 171

staff assistance visit 237

survey of alert and notification system 45

tabletop exercise 156
definition 301

timely manner
alert and mobilization 179
alert and notification 197
alert and notification in exception areas 198
definition 301
emergency public information 199
primary route alerting 197
protective action decision making 184
providing KI and dosimetry to emergency workers 183

transient populations
alert and notification of 44, 46, 197
as scenario variable 132, 165
definition 302
included in monitoring capacity estimate 104
potassium iodide for 181
public information materials for 55, 57, 60, 249, 257

trigger/action levels
definition 302

trigger/action levels for decontamination 105, 116

FEMA

FEMA P-1028
Catalog No. 15021-1