



Program Manual

Radiological Emergency Preparedness

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FEMA

THD Director's Foreword

The Technological Hazards Division (THD) Federal Emergency Management Agency (FEMA) Radiological Emergency Preparedness (REP) Program is moving into its fifth decade of providing radiological preparedness support and oversight for state, local, and tribal governments surrounding nuclear power plants (NPPs). Regardless of how our mission and structure have changed over the years, the fundamental character, inspiration, and motivation of the REP Program remains the same: serve our Nation by assisting our communities and first responders, especially when they are most in need, before, during, and after disasters.

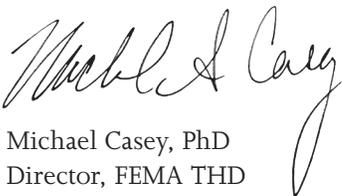
As we continue to enhance FEMA's REP Program, we must view all the work FEMA does in concert with the emergency management community as part of a broad plan for addressing the demands and challenges of catastrophic disasters. FEMA THD drives FEMA initiatives through the REP Program's interactions with the state, local, and tribal governments as well as the Federal interagency:

- **Whole Community.** To ensure our efforts become part of an interconnected plan of action, we continue to focus on our "Whole Community" initiative. "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 and recovery strategy to such events.
- **National Preparedness System (NPS).** In addition, this updated version of the REP Program Manual (RPM) continues THD's evolution of adopting and aligning REP policy and doctrine with the NPS. Part III of this guidance document adapts core capabilities from the National Preparedness Goal into the REP assessment strategies.
- **Community Lifelines.** THD advances FEMA's Community Lifelines concept through our Strategic Plan. Our Strategic Plan outlines three goals for the emergency management community: (I) Build a Culture of Preparedness, (II) Ready the Nation for Catastrophic Disasters, and (III) Reduce the Complexity of FEMA. The goals and objectives outlined in the Strategic Plan will reduce risk to Community Lifelines before a disaster and support rapid stabilization and restoration during and after a disaster. A lifeline enables the continuous operation of government functions and critical business and is essential to human health, safety, or economic security.

Our experiences over the years have 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 state, local, and tribal communities and integrating the public as a critical resource.

Each emergency preparedness plan addresses the "unique" considerations that exist in the event of a catastrophic accident or incident at a commercial NPP. We believe that the communities' radiological emergency response plans are a key part of a community's comprehensive emergency management program. This important planning concept has served REP communities well over the years, and will continue to serve REP communities in the future as the threat dynamic changes and NPPs enter into decommissioning and the next generation of small modular reactors arrive on scene.

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, as the "whole community," we need to continue forward as the great team we have become since the accident at Three Mile Island (TMI) started us on the path of focused offsite radiological planning and preparedness. I look forward to cultivating our partnerships as we continue to enhance and refine the REP Program.



Michael Casey, PhD
Director, FEMA THD

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Disclaimer

If you identify any errors, omissions, misinterpretations, or aspects of this Manual that may be unclear, please contact FEMATHDPolicy@fema.dhs.gov.

FEMA only “approves” state and local plans and procedures pursuant to 44 CFR Part 350. FEMA does not endorse, approve, certify, or recommend any contractors, firms, or products. Contractors, individuals, or firms shall not claim they or their products are “FEMA approved” or “FEMA certified.”

OMB Collection Reference

This Manual contains information collection requirements covered by 44 CFR Part 350 that the Office of Management and Budget (OMB) approved under OMB control number 1660-0024.

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Implementation

The 2019 version of the RPM replaces the 2016 version of the RPM and is expected to be implemented upon issuance. The FEMA Regional Assistance Committee (RAC) Chairs will provide assistance and direction for implementing the RPM to those organizations actively involved in planning and evaluation activities at the time of issuance.

The RPM remains a living, non-binding guidance document, and FEMA welcomes user feedback throughout the ongoing revision and update process. This is especially important since this version of the RPM includes important revisions that supplement the implementation of NUREG-0654/FEMA-REP-1, Rev. 2, the updated REP Program assessment policies and guidance, and the update of the alert and notification system (ANS) review/approval process to clarify existing guidance and accommodate new technologies such as the Integrated Public Alert and Warning System (IPAWS) and the Wireless Emergency Alert (WEA) system.

FEMA will collect all questions, comments, and recommended edits and consider them for incorporation in the next version of the RPM. In the interim, users may utilize the alternative approach process which provides an opportunity for state, local, and tribal governments, applicants, and licensees to meet the planning standards in a manner that is different from what the NUREG-0654/FEMA-REP-1, Rev. 2 evaluation criteria recommend. During the implementation phase for the 2019 RPM, the FEMA RAC Chairs will coordinate with their respective offsite response organizations (OROs) to identify opportunities for stakeholder engagements to address any questions about the 2019 RPM. In addition, stakeholder engagement will allow FEMA Regional staff to collect and forward comments and questions to FEMA THD to ensure consistency in implementation and that appropriate clarifications are included in the next revision of the RPM. OROs can submit any questions, comments, and recommended edits to FEMATHDPolicy@fema.dhs.gov.

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Introduction to the FEMA REP Program Manual

The FEMA REP RPM is a FEMA developed and maintained guidance document. The RPM serves as a key source of policy and guidance for the FEMA REP Program and its primary stakeholders, which include (1) OROs; (2) FEMA Headquarters and regional staff; (3) Federal government agencies supporting the review and approval of state, local, and tribal government plans and procedures, and (4) licensee OROs.

The RPM provides FEMA guidance that interprets the 16 planning standards and associated evaluation criteria in NUREG-0654/FEMA-REP-1, Rev. 2 by providing additional level of detail on what FEMA anticipates will be included in offsite (area beyond the NPP site boundary) radiological emergency plans and procedures. The RPM also provides guidance on how FEMA assesses offsite radiological emergency plans and procedures, as well as supplementary information that addresses the capabilities of the REP Program and its relationship with state and local partners throughout the radiological community. Radiological incidents focus on a unique set of challenges that are not experienced by many in the preparedness community. In an effort to strengthen response against catastrophic incidents, FEMA is aligning the REP Program with the NPS to ensure that not only preparedness is addressed, but also the five mission areas: prevention, protection, recovery, response, and mitigation.

A. ALIGNMENT WITH MODERN EMERGENCY MANAGEMENT DOCTRINE

The FEMA REP community leads the nation in building a culture of preparedness, strengthening and sustaining the critical elements necessary to support the five mission areas all while safeguarding the health and safety of the public in communities surrounding commercial NPPs. As described in U.S. Presidential Policy Directive 8 (PPD-8), national preparedness is a shared responsibility of all levels of government, the private and nonprofit sectors, and individual citizens. Everyone can contribute to safeguarding the nation from harm. The National Preparedness Goal is the cornerstone for the implementation of PPD-8; identified within it are the Nation's 32 core capabilities. The NPS is an integrated set of guidance, programs, and processes that enable the Nation to meet the National Preparedness Goal.

Since FEMA supports and encourages a meaningful, collaborative relationship with the whole community, the incorporation of the NPS into REP Program guidance helps ensure emergency planning is risk- and threat-informed and appropriate for the whole community. The NPS contains a number of concepts that may assist OROs with their emergency planning, including, but not limited to, the National Planning Frameworks; Comprehensive Preparedness Guide (CPG) 101, *Developing and Maintaining Emergency Operations Plans*; and CPG 201, *Threat and Hazard Identification and Risk Assessment (THIRA) and Stakeholder Preparedness Review (SPR) Guide*.

The National Planning Frameworks describe how communities coordinate, share information, and work together to achieve the National Preparedness Goal. Each of the National Planning Frameworks describes the coordinating structures and alignment of key roles and responsibilities to support interoperability across all mission areas.

CPG 101 provides guidance for developing emergency plans and promotes understanding of risk-informed planning and preparedness; it is designed to help both novice and experienced planners navigate the planning process. Used in its entirety, CPG 101 provides information and instruction on the fundamentals of planning and application. CPG 201 provides guidance for conducting the three-step process for a THIRA and the three-step process for a SPR, formerly the State Preparedness Report. CPG 201 includes both the THIRA and SPR as they are interconnected processes that, together, communities use to evaluate their preparedness. All types of communities can complete the THIRA/SPR as a way to better understand the risks they face and to help make important decisions on how to prevent, protect against, mitigate, respond to, and recover from the threats and hazards that pose the greatest risks. Together, the CPGs provide a risk-informed basis for offsite planning

efforts and encourage community engagement to address risks that might impact a jurisdiction. When applicable, the CPGs allow for the radiological emergency plan to be integrated with all-hazards plans.

Guidance in the RPM incorporates other NPS elements, such as the 32 core capabilities, Homeland Security Exercise and Evaluation Program (HSEEP), and National Incident Management System (NIMS) to facilitate integration of radiological and other all-hazard planning and preparedness efforts. Doing so provides greater flexibility to OROs in addressing REP Program capabilities and requirements, while strengthening their overall preparedness posture within their communities.

B. USE OF THIS DOCUMENT

The RPM summarizes the history and the technical basis of the REP Program, REP Program operational guidance and policy documents, the REP planning and preparedness assessment process, and other programmatic administrative policies and procedures (e.g., plan review process, evaluation of radiological emergency preparedness, etc.). The RPM also provides useful implementation tools to help stakeholders perform various REP Program functions, such as checklists, templates, matrices, references, etc. The RPM is intended for stakeholders to use as supplemental guidance for clarifying or addressing REP Program capabilities and provisions.

1. Use by OROs

ORO includes any state, local, or tribal governmental organization; private or voluntary organization; or licensee ORO that is responsible for carrying out emergency response functions during a radiological incident.

For OROs participating in the FEMA REP Program, the RPM provides a wealth of information and guidance in developing and maintaining their organization's radiological emergency plans and preparedness programs. The RPM outlines the level of detail that should be provided in ORO radiological emergency plans and for describing their organization's capabilities, such as examples of acceptable implementation approaches or methods used to address capabilities. For instance, this includes providing example methods OROs can use to identify individuals who need evacuation assistance during an emergency.

ORO may use the RPM to understand various REP Program policies and processes (e.g., approval process for alternative approaches, etc.), and the technical basis of the REP Program. Further, OROs may utilize checklists, templates, etc. provided in the RPM to support their planning and preparedness efforts. This includes, but is not limited to, the Public Information Review Guide and Annual Letter of Certification (ALC) Checklist.

2. Use by FEMA Headquarters and Regional Staff Working in the REP Program

FEMA Headquarters and Regional staff working in the REP Program assist state, local, and tribal governments with their radiological emergency planning and preparedness efforts. In order to ensure their radiological emergency plans and preparedness are adequate to protect public health and safety in the event of a radiological incident, FEMA works with OROs to assess their capability to implement various aspects of their emergency plans.

FEMA uses the RPM to support their review of ORO radiological emergency plans, assess offsite preparedness, and provide technical assistance to OROs, including providing clarification on planning guidance found within the RPM. FEMA may use the RPM in preparing, conducting, evaluating, and/or assessing REP activities.

3. Use by Federal Government Agencies Supporting the Review and Approval of State, Local, and Tribal Government Planning and Preparedness

In addition to FEMA, other Federal agencies, such as those serving on the RAC, may be involved in reviewing and approving state, local, and tribal government radiological emergency plans. The RAC is a group of representatives from a number of Federal agencies that have agreed to assist the FEMA Region in providing technical assistance to OROs. The RAC also supports the evaluation of radiological emergency plans/procedures and exercise play on the basis of their special authorities, missions, and expertise.

4. Use by Licensee OROs

For licensees fulfilling and/or conducting offsite emergency response activities and functions traditionally addressed by state, local, and/or tribal government organizations, it is recommended that the licensee OROs address the evaluation criteria for any of the non-participating OROs. In these instances, licensee OROs may use the RPM similarly to typical OROs when developing and maintaining their offsite emergency response activities and functions for their NPP site.

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PART I: The REP Program

A. MISSION STATEMENT

The primary mission of the Department of Homeland Security (DHS)/FEMA is helping people before, during, and after disasters. In support of the primary mission of DHS/FEMA, the THD REP Program:

- Ensures that state, local, and tribal governments can adequately protect the health and safety of the public living in the vicinity of the NPPs, as defined by Public Law 96-295, in the event of an incident at an NPP;
- Informs and educates the public about radiological emergency preparedness; and
- Supports and provides guidance to state, local, and tribal governments' emergency planning and preparedness activities that take place offsite, or beyond the boundaries of the owner-controlled area around the NPP.

The Program assists state, local, and tribal governments in the development and conduct of offsite radiological emergency preparedness activities within the emergency planning zones (EPZs) of Nuclear Regulatory Commission (NRC)-licensed commercial nuclear power facilities.

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

B. PURPOSE

The RPM serves as the principal source of 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.

NUREG-0654/FEMA-REP-1, Rev. 2

It is FEMA's position that, unless an alternative approach is proposed and accepted, the associated evaluation criteria will be accomplished.

State, local, and tribal government participation in offsite radiological emergency planning and preparedness is voluntary. However, participation in the REP Program necessitates adherence to the program requirements as set forth in 44 CFR Part 350. If state, local, or tribal governments choose not to participate in the REP Program, 44 CFR Part 352 outlines how licensees develop offsite plans/procedures to protect the public health and safety acting in the place of state, local or tribal governments.

The evaluation criteria outlined in NUREG-0654/FEMA-REP-1, Rev. 2 are considered by FEMA to be an acceptable means for meeting the intent of the planning standards in 44 CFR 350.5 and for addressing offsite emergency plans and procedures. Further, FEMA, NRC, and other Federal agencies use the guidance contained in NUREG-0654/FEMA-REP-1, Rev. 2 in their individual and joint reviews of the radiological emergency response plans and preparedness of state, local, and tribal governments, and the plans and preparedness of applicants for, and holders of, a license to operate a nuclear power reactor.

Comprehensive reference guide. FEMA updates and maintains this Manual for use by its stakeholders as a desk reference when needed to answer questions or receive clarification on REP Program planning, exercises, and/or administrative procedures. The RPM effectively retires incorporated documents from use as independent resources; retired guidance documents appear in Appendix D as historical resources. The RPM 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.

Alternative approaches. The evaluation criteria listed in NUREG-0654/FEMA-REP-1, Rev. 2, as interpreted and applied by the NRC, FEMA, and other Federal agencies, represent approved approaches for meeting the intent of the planning standards. OROs may provide written proposals for alternative approaches to the appropriate FEMA Regional Office. Alternative approaches provide an opportunity for state, local, and tribal governments, applicants, and licensees to meet the planning standards in a manner that is different from what the evaluation criteria recommend. While an alternate approach does not relax the requirements of the planning standards, it provides an opportunity to propose an alternative method for meeting the intent of the planning standards. The FEMA Regional Offices will review alternative approach proposals and forward its recommendation to FEMA Headquarters for review and approval; the review of proposals will include input from the RAC. FEMA will also coordinate with the NRC and licensees when the alternative approach may affect onsite planning and preparedness.

Reasonable Assurance. In the communities surrounding commercial NPPs, 44 CFR 350.5(b) directs FEMA's REP Program to review state, local, and tribal radiological emergency plans and preparedness. Approved plans and procedures "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 NRC licensee or applicant onsite plans and state, local, and tribal government and utility offsite plans and preparedness are adequate to protect public health and safety in the emergency planning areas of a commercial NPP. FEMA will consider plans, procedures, personnel, training, facilities, equipment, drills, and exercises, which are all important to the effective implementation of protective measures offsite in the event of any incident at a commercial NPP.

FEMA will make its determination of suitability through the support of 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 is guided by the planning standards, evaluation criteria, and policies found in applicable laws, regulations, and contemporary emergency preparedness guidance. 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 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 RPM 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 includes alignment with HSEEP guidance, and continues to streamline the Federal, state, local, and tribal efforts and resources with the goal of employing a common assessment strategy.

C. SCOPE

The RPM provides FEMA guidance that interprets the planning standards and associated evaluation criteria in NUREG-0654/FEMA-REP-1, Rev. 2. This guidance provides additional detail to OROs on what is expected to be included in their radiological emergency plans. Further, the RPM provides information and guidance (e.g., checklists, templates, references, etc.) to help FEMA staff and OROs perform various REP Program functions.

Communities potentially affected by a radiological incident at a nearby commercial NPP benefit from emergency 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 to ensure planning and preparedness efforts remain effective and consistent with relevant regulations.

The term “ORO” refers to a state, local, and/or tribal government, a licensee emergency response organization (ERO) (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 ERO is responsible for activities onsite (within the NPP site boundary). Because FEMA acknowledges that local authorities vary from state to state, the RPM uses the term “ORO” or “OROs” instead of specifying state, local, and/or tribal governments. Certain REP activities may be the responsibility of the state in one locality and the responsibility of local jurisdictions in another. In other words, the guidance applies only to the entities responsible for the function being discussed.

The term “plans/procedures” as used in the RPM includes radiological emergency preparedness and response plans that are associated with 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 planning standards. FEMA uses the generic term “plans/procedures” specifically for flexibility. OROs may either incorporate procedural detail into the main plans or into separate procedural documents at its discretion.

The RPM is divided into five main parts and includes appendices and reference documents.

Part I introduces the REP Program and provides an overview, including the establishment of FEMA, THD, and the REP Program, and basic information about the fundamentals of the REP Program.

Part II contains the planning standards and associated NUREG-0654/FEMA-REP-1, Rev. 2 evaluation criteria, along with explanations and guidance on materials to be included or addressed in ORO plans/procedures. These explanations are solely guidance and neither exceed nor replace any Federal regulations.

Part III outlines guidance for planning, preparing, and executing REP assessment activities in accordance with the unique regulatory requirements of the REP Program.

Part IV contains reference information in support of the Program on topics such as potassium iodide (KI) for the public, disaster-initiated reviews (DIRs), scenario reviews, plan reviews, the ALC, etc.

Part V presents information regarding the evaluation of alert and notification systems (ANSs).

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

D. BASIS OF THE REP PROGRAM

This section provides an overview of THD and its role in preparedness as it relates to FEMA. It also addresses the establishment of the REP Program and programmatic changes specific to the REP Program, including the assessment method and strategy, the ongoing recovery activities, and a better integration with Federal play during exercises.

1. Establishment of the REP Program

After Congressional approval of Reorganization Plan No. 3 of 1978, President Carter delegated to FEMA certain functions and authorities vested in him by the Congress by Executive Orders 12127 and 12148.¹ Since April 1, 1979, FEMA has been the Nation's sole agency dedicated to managing disasters.²

Following the March 1979 Three Mile Island accident and the recommendations of the Kemeny Commission,³ through a December 7, 1979 Presidential announcement, the President directed the Administrator of FEMA to take the lead in state and local emergency planning and preparedness activities with respect to nuclear power facilities.⁴ This included a review of the existing offsite emergency plans both in states with operating reactors and those with plants scheduled for operation in the near future. This assignment was given to FEMA because of its responsibilities under Executive Order 12148 to establish Federal policies for and to coordinate civil emergency planning, management and assistance functions and to represent the President in working with state and local governments and the private sector to stimulate vigorous participation in civil emergency preparedness programs.⁵ 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 Robert T. Stafford Disaster Relief and Emergency Assistance Act.⁶ Accordingly, FEMA established its REP Program to manage its responsibility to review, evaluate, and approve offsite emergency planning and preparedness in areas around commercial NPPs. The NRC retained responsibility for onsite activities and authority for making licensing decisions.

The NRC Authorization Acts of 1980 and 1982-1983 directed the NRC to establish emergency preparedness as a criterion for licensing commercial NPPs.⁷ Section 109 of Public Law 96-295 directed the NRC to establish through rulemaking (a) standards, developed in consultation with FEMA, for the evaluation of state and local government radiological emergency planning and preparedness and (b) a requirement that the NRC will issue operating licenses only if it determines that there is (i) a state or local emergency response plan compliant with the standards developed in consultation with FEMA or (ii) in absence of such a plan, a state, local, or utility emergency response plan that provides reasonable assurance that public health and safety is not endangered by the NPP's operation.⁸ The NRC revised its regulations in Part 50 of Title 10 of the CFR to incorporate additional emergency preparedness requirements, including 16 planning standards for onsite and offsite emergency plans as required by Public Law 96-295. FEMA maintains the same 16 planning standards in its regulations in Part 350 of Title 44 of the CFR.

¹ Executive Order 12127, *Federal Emergency Management Agency* (Mar. 31, 1979) (as amended) and Executive Order 12148, *Federal Emergency Management* (July 20, 1979) (as amended), respectively.

² See *The Federal Emergency Management Agency Publication 1* (April 2016), p. 4.

³ *Report of the President's Commission on the Accident at Three Mile Island, The Need for Change: The Legacy of TMI* (1979).

⁴ Jimmy Carter, President's Commission on the Accident at Three Mile Island Remarks Announcing Actions in Response to the Commission's Report. Online by Gerhard Peters and John T. Woolley, *The American Presidency Project* <https://www.presidency.ucsb.edu/node/248009>.

⁵ Executive Order 12148, *Federal Emergency Management* (July 20, 1979) (as amended). Pursuant to DHS Delegation 9000.1, the DHS Secretary delegated to the FEMA Administrator the authority to perform the functions assigned to the Secretary of Homeland Security in Executive Order 12148, as revoked in part and amended by Section 1 of Executive Order 12673 and Section 52 of Executive Order 13286 of February 28, 2003, relating to FEMA.

⁶ Pub. L. No. 93-288 (1974) (codified as amended at 42 U.S.C. § 5131). The Stafford Act constitutes the statutory authority for most Federal disaster response activities, especially as they pertain to FEMA and FEMA programs.

⁷ See Pub. L. No. 96-295 (1980) and Pub. L. No. 97-415 (1983), respectively. Congress reenacted the provisions of section 109(a)(2) of Public Law 96-295 related to emergency planning in two subsequent laws: section 5 of Public Law 97-415 and section 108 of Public Law 98-553. These laws provided authorization of appropriations for the NRC for fiscal years 1982/1983 and 1984/1985, respectively. Although the laws have since expired, the basic terms of the emergency planning provisions of these laws are contained in both NRC and FEMA regulations.

⁸ Pub. L. No. 96-295, Sec. 109 (b)(1)(A)-(B).

In November 1980, the NRC and FEMA jointly issued NUREG-0654/FEMA-REP-1, Rev. 1 to provide onsite and offsite planning guidance to protect public health and safety in the event of an incident at an NPP.⁹ 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. In 2019, the document was updated to create NUREG-0654/FEMA-REP-1, Rev. 2. This update reflects changes to both NRC and FEMA regulations, guidance, policies, and doctrine, as well as advances in technology and best practices that have occurred since the document was originally issued. This update also incorporates the four supplemental documents and addenda that have been issued in the intervening years, and is intended to modernize and consolidate the guidance making it easier for users to understand.

In addition, FEMA promulgated regulations at 44 CFR Parts 350-354. In general, these regulations address how FEMA reviews and approves ORO emergency plans/procedures for responding to radiological incidents at commercial NPPs; describes Federal agency roles and responsibilities regarding Federal assistance to state and local governments in their radiological emergency planning and preparedness activities; addresses how FEMA interacts with the licensee when a state and/or local government declines or fails to prepare offsite radiological emergency preparedness plans adequately to satisfy NRC licensing requirements or to participate adequately in the preparation, demonstration, testing, exercise, or use of such plans; and describes the methodology for FEMA to assess and collect user fees from NRC licensees.

When DHS was created in 2003, it integrated FEMA and 21 other legacy organizations. After this integration, most of FEMA's preparedness programs were moved from FEMA and consolidated in a separate DHS Emergency Preparedness and Response Directorate; however, after Hurricane Katrina struck the Gulf shores in August 2005, it was determined that the 2003 separation of response and recovery from preparedness, along with the separation of counterterrorism and natural hazard capability building, presented major obstacles to a unified approach and implementation during the response. Gaps in all-hazards preparedness surfaced at every level, ultimately calling for post-Katrina Congressional activity in the form of the Post-Katrina Emergency Management Reform Act of 2006 (PKEMRA),¹⁰ which reunited preparedness, response, and recovery programs under the umbrella of FEMA. This cohesive coordination works to enhance the Nation's preparedness to prevent, protect against, respond to, recover from, and mitigate all hazards.

2. REP Program Initiatives

Over the course of the last few years, the REP Program has undergone some programmatic changes to both planning and assessment activities. Some of these changes include supporting and participating in nationwide preparedness activities and guidance, such as the NPS and the National Preparedness Goal. Other modifications were a result of modernizing long-standing programmatic guidance to ensure it properly reflected today's preparedness and emergency management landscape.

a. Alignment with NUREG-0654/FEMA-REP-1, Rev. 2

This Manual reflects the updated policy and guidance changes found in the recently revised NUREG-0654/FEMA-REP-1, Rev. 2. The incorporated changes include the updating and modernization of general emergency planning information pertinent to commercial NPPs; further, there was a refocusing of the evaluation criteria on overall emergency preparedness program capabilities essential to meet each of the planning standards found in NRC regulations at 10 CFR 50.47(b) and FEMA regulations at 44 CFR 350.5(a). While reflected throughout the RPM, the majority of the changes associated with the update of NUREG-0654/FEMA-REP-1, Rev. 2 can be found in Part II.

⁹ 45 FR 85862 (Dec. 30, 1980).

¹⁰ Pub. L. No. 109-295 (2006) (codified as amended at 6 U.S.C. § 701 et seq.).

b. REP Program Assessment Strategy

FEMA validates reasonable assurance using a holistic assessment strategy that allows for a comprehensive evaluation of offsite radiological emergency planning and preparedness using specific objectives and capability targets that meet the intent of the planning standards of 44 CFR 350 and support the assessment of core capabilities. FEMA assesses preparedness on an ongoing basis and reports out on the overall state of preparedness biennially, in the Biennial Preparedness Report, supported by input from OROs. This more focused approach to assessment can be found in Part III.

c. ANS Guidance

The updated ANS guidance describes the minimum ANS design objectives, and the process for the review and approval of a new ANS or when a change to a previously approved ANS is proposed. This guidance is provided to OROs for the preparation and submittal of an ANS evaluation report. The ANS evaluation report is divided into two main sections: the ANS plan, where the administrative means and emergency planning aspects of the system are addressed, and the design report, where the physical means and technical components of the system are detailed. The ANS evaluation report includes the integration of FEMA IPAWS and WEA system into ANS planning if utilization of these systems is to be proposed. Additional information can be found within Part V.

E. EVALUATION OF RADIOLOGICAL EMERGENCY PREPAREDNESS

The planning guidance contained in Part II of the RPM explains the planning standards and associated NUREG-0654/FEMA-REP-1, Rev. 2 evaluation criteria that apply to OROs. Certain evaluation criteria in NUREG-0654/FEMA-REP-1, Rev. 2, including all of those in planning standard B, Emergency Response Organization, do not pertain to offsite planning and preparedness; however, the RPM incorporates all of the planning standards and evaluation criteria to maintain consistency with 44 CFR Part 350 and NUREG-0654/FEMA-REP-1, Rev. 2.

1. FEMA-NRC Memorandum of Understanding

FEMA and the NRC entered into a memorandum of understanding (MOU) to establish a framework of cooperation between FEMA and the NRC in radiological emergency response planning and preparedness matters so that their mutual efforts will be directed towards more effective plans and related preparedness measures at and in the vicinity of utilization facilities, as defined in Public Law 96-295.

Under the MOU, FEMA coordinates Federal planning for offsite impact of radiological emergencies and takes the lead for assessing offsite radiological emergency response planning and preparedness, and provides its findings to the NRC under various circumstances, including but not limited to:

- Reviewing ORO plans/procedures when the Governor of a state submits them for formal review.
- Providing interim findings on the current state of preparedness based on its review of site-specific plans/procedures and exercise performance. For example, the NRC may request an interim finding in connection with an application for an ESP under 10 CFR 52.17(b)(2).
- Leading the development of radiological preparedness-focused information and education programs.
- Reviewing the application for an ESP under 10 CFR Part 52.
- Initiating a Preliminary Capabilities Assessment (PCA) and/or 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 on Emergency Preparedness: The focal point for coordination of emergency planning and preparedness. The Steering Committee consists of an equal number of members to represent each agency with one vote per agency. When the Steering Committee cannot agree on the resolution of an issue, the issue will be referred to FEMA's and the NRC's management. Further, the Steering Committee will establish the day-to-day procedures for assuring that the agreements within the MOU are carried out. Any follow-up reports or documentation of actions will be coordinated through the Steering Committee. Details of this arrangement are articulated in the FEMA/NRC Steering Committee Charter.

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 Headquarters- and regional-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 REP personnel evaluate plans/procedures with assistance from RAC members. The RACs consist of representatives from 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 Resilience¹¹ or designee. FEMA Headquarters forwards its review 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 (RA) 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 RA makes a detailed review of the plans/procedures according to the planning standards and associated NUREG-0654/FEMA-REP-1, Rev. 2 evaluation criteria and assesses factors such as adequacy and maintenance of procedures, training, resources, staffing, and equipment. The RA works with the state to resolve any inadequacies identified in this review.

Withdrawal of approval: If, at any time, the Deputy Administrator of Resilience determines that the plans/procedures are no longer adequate or are no longer capable of implementation, he or she advises the Governor of the affected state, the appropriate RA, and the NRC. The Deputy Administrator of Resilience must spell out in detail the reasons for this determination. The state then has 120 days to either correct the Level 1 Findings noted or submit an acceptable plan for correcting them. If a plan for correcting Level 1 Findings is submitted, the Deputy Administrator of Resilience negotiates with the state regarding the schedule for implementing the corrective action plan. If the state does not correct the Level 1 Findings and does not submit an acceptable plan after 120 days, or if the state submits an acceptable plan but fails to correct the Level 1 Findings by the agreed-upon date, the Deputy Administrator of Resilience may withdraw FEMA approval of the plans/procedures and proceed to notify the appropriate Governor, the NRC, and the appropriate RA.

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 Federal Radiological Preparedness Coordinating Committee (FRPCC) and the RACs, and defines 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), Department of Agriculture (USDA), Department of Commerce (DOC), and other Federal departments where appropriate. FRPCC functions include:

- Assisting FEMA in providing policy direction for the REP Program and other Federal assistance to OROs in their radiological emergency planning and preparedness activities;
- Establishing subcommittees to aid in carrying out its functions (e.g., research, training, emergency instrumentation, transportation, information, education, and Federal response);
- Assisting FEMA in resolving issues related to granting final FEMA approval of state or tribal plans/procedures; and

¹¹ There has been an organizational change within FEMA that has caused the titles of the positions to change. The administrative change to the regulations has not yet occurred.

- Coordinating 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, with a FEMA regional representative chairing 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 Annex¹² of the Response and Recovery Federal Interagency Operational Plans (FIOPs).

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, needs to be considered by the Deputy Administrator of Resilience (or designee). This change would be considered in order to decide that ORO plans/procedures and preparedness efforts 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 incident; and (2) capable of being implemented. However, the RA 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 their plans annually to ensure that all information is current, regardless of whether any changes need 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 the ALC from the state to FEMA certifying the completion of other elements necessitated by NUREG-0654/FEMA-REP-1, Rev. 2. These other elements include things 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 (TTXs); other types of drills; seminars; training activities; interviews; and responses to real-world incidents. 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.

¹² October 2016. <https://www.fema.gov/media-library/assets/documents/25554>.

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),¹³ 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 radiation 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 ($\text{rem} = \text{rad} \times \text{radiation weighting factor}^{14}$).

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.
- 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.

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 human 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.

¹³ 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 Gy = 100 rad); and Sievert (Sv) instead of rem (1 Sv = 100 rem).

¹⁴ 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.

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

- **Alpha radiation** comes from the ejection of alpha particles from the nuclei of some unstable atoms. An alpha particle is identical to a helium nucleus and consists of two protons and two neutrons. Alpha particles are highly energetic, but can only travel a few centimeters in air. They have low penetrating power and can be stopped by a sheet of paper. Alpha particles generally cannot even penetrate the layer of dead cells on the skin, but can pose a health risk when inhaled or ingested.
- **Beta radiation** comes from the emission of beta particles during radioactive decay. Beta particles are highly energetic and fast-moving. They carry a positive or negative charge and can be stopped by a layer of clothing or few millimeters of a solid material. Beta particles can penetrate the skin and cause skin burns, but tissue damage is limited by their small size. Beta particles are most hazardous when inhaled or ingested.
- **Gamma radiation** is high-energy, short-wavelength, electromagnetic radiation emitted from the nucleus of an atom. Gamma radiation frequently accompanies emissions of alpha particles and beta particles, and always accompanies fission. Gamma rays are similar to X-rays, but are very penetrating and best stopped or shielded by dense materials, such as lead or depleted uranium.

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. Each protective 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 100 R	No impairment to the central nervous system (CNS) function
100 to 200 R	No impairment to the CNS function
200 to 600 R	Cognitive impairment for 6-20 hours
600 to 800 R	Cognitive impairment for >20 hours
>800 R	Rapid incapacitation

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 KI to emergency workers, populations who cannot be evacuated, and, where included in the emergency plans/procedures, the general public;
- Controlling surface contamination;
- Feeding livestock 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 projected 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 the thyroid. These PAGs appear in EPA-400/R-17/001, *PAG Manual: Protective Action Guides and Planning Guidance for Radiological Incidents* January 2017 (referred herein as “EPA PAG Manual”). 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 also 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.¹⁵ 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.

The following are the 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 or less whole body in first year.

EPA also established an intermediate-phase relocation PAG¹⁶ of 2 rem or less 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 PAG Manual. 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 following are the EPA 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 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.

¹⁵ Federal Register, Vol. 63, No. 156, pp.43402-43403, *Guidance on Accidental Radioactive Contamination of Human Food and Animal Feeds: Recommendations for State and Local Agencies; Availability*, Food and Drug Administration, August 13, 1998.

¹⁶ EPA-400/R-17/001, *PAG Manual: Protective Action Guides and Planning Guidance for Radiological Incidents*, January 2017.

4. Emergency Planning Zones

The 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 the event 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. Each EPZ is a roughly circular area, with the NPP at the center. Exhibit I-2 summarizes the characteristics of these two types of EPZs.

The EPZ sizes represent a technical judgment based on the type and quantity of hazardous materials (HAZMAT) 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	<ul style="list-style-type: none"> ▪ 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 	<ul style="list-style-type: none"> ▪ 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, Rev. 2:

- 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;
- Detailed planning within approximately 10 miles would provide a substantial base for expansion of response efforts to a larger area, if necessary; and
- 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: The beginning of a radiological incident for which immediate decisions for effective use of protective actions are required and must therefore be based primarily on the status of the radiological incident and the prognosis for worsening conditions. This phase may last from hours to days.

The intermediate phase: The period beginning after the source and releases have been brought under control (has not necessarily stopped but is no longer growing) and reliable environmental measurements are available for use as a basis for decisions on protective actions and extending until these additional protective actions are no longer needed. This phase may overlap the early phase and late phase and may last from weeks to months.

The late phase: The period beginning when recovery actions designed to reduce radiation levels in the environment to acceptable levels are commenced and ending when all recovery actions have been completed. This phase may extend from months to years. A PAG level, or dose to avoid, is not appropriate for long-term cleanup.

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PART II: REP Program Planning Guidance

A. INTRODUCTION

1. Purpose and Scope

This part of the RPM 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 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 RPM 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.

2. Contents and Organization

Part II has two major Subparts:

Subpart B, Planning Standards, is a one-page listing of the 16 planning standards from 44 CFR Part 350 and 10 CFR Part 50.47.

Subpart C, Planning Guidance, lists the planning standards and associated NUREG-0654/FEMA-REP-1, Rev. 2 evaluation criteria. Subpart C also provides interpretation and application of the guidance, including the following:

- A listing of NUREG-0654/FEMA-REP-1, Rev. 2 evaluation criteria related to each planning standard;
- An explanation of each NUREG-0654/FEMA-REP-1, Rev. 2 evaluation criterion based on current guidance; and
- Marks indicating the applicability of each NUREG-0654/FEMA-REP-1, Rev. 2 evaluation criterion to plans/procedures (i.e., licensee, state, local, or tribal).

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

NOTE: While the NRC is responsible for the NUREG-0654/ FEMA-REP-1, Rev. 2 evaluation criteria specific to the activities of nuclear licensees (e.g., evaluation criterion B.1), these evaluation criteria have been included in the RPM to maintain continuity with the planning standards as set forth in 44 CFR Part 350 and 10 CFR Part 50.47. 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 explanations provided by FEMA in this guidance are only intended for and applicable to OROs.

B. PLANNING STANDARDS

Planning Standard A – Assignment of Responsibility

Planning Standard B – Emergency Response 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, Reentry, 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 GUIDANCE

Planning Standard A – Assignment of Responsibility

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

EVALUATION CRITERION A.1

The Federal, state, local, and tribal governments, licensee, and other private sector organizations that comprise the overall response for the EPZs are identified.

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

TO MEET THE INTENT OF EVALUATION CRITERION A.1, ORO PLANS/PROCEDURES INCLUDE:

- i. A description of all Federal, state, local, tribal, and private-sector organizations comprising the overall offsite response; and
- ii. A list of all principal and supporting organizations.

EXPLANATION

Plans/procedures document all Federal, state, local, tribal, and private-sector organizations that comprise the overall response for the plume and ingestion exposure pathway EPZs and the responsibilities each assumes. Plans/procedures identify the licensee and principal organizations (e.g., emergency management, fire/HAZMAT, law enforcement) with a major or lead roles in emergency planning, preparedness, and response.

Plans/procedures also identify other organizations having a supporting role to the principal organizations. Supporting organizations include any Federal departments and agencies (e.g., FEMA, NRC, Federal Bureau of Investigation [FBI]) or private-sector or volunteer organizations (e.g., American Red Cross [ARC], Radio Amateur Civil Emergency Services [RACES]) with identified supporting response responsibilities.

Homeland Security Presidential Directive 5 (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 Post-Katrina Emergency Management Reform Act (PKEMRA) do not apply to private sector entities, such as licensees. Licensees are not required to adopt NIMS, but encouraged to do so to ensure effective response and coordination between licensee and OROs. Per NRC regulations in 10 CFR 50.47(b)(3) & (b)(6), licensees are required to ensure that their programs integrate with those of the OROs.

Although HSPD-5 does not require the adoption of NIMS for OROs not seeking Federal preparedness assistance, the integration of NIMS/Incident Command System (ICS) into ORO emergency plans/procedures for NPPs will provide greater consistency across response jurisdictions and facilitate integration of response elements during an incident at an NPP. 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

- FEMA Comprehensive Preparedness Guide 101, *Developing and Maintaining Emergency Operations Plans*, Version 2.0, November 2010.

- EPA-400/R-17/001, PAG Manual: Protective Action Guides and Planning Guidance for Radiological Incidents, January 2017.
- National Incident Management System, Third Edition, October 2017.
- National Response Framework, Third Edition, June 2016.

EVALUATION CRITERION A.1.a

The organizations having an operational role specify their concept of operations and relationship to the total effort.

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

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

- i. A description of each organization's operational role in an emergency and their relationship to the overall response effort.

EXPLANATION

Plans/procedures describe how all applicable organizations with an operational role respond to an incident at an NPP, including anticipated outcomes, how efforts will be accomplished, and by whom. For 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 the ORO's role and response measures to be taken in an emergency should include how the organization fits into and contributes to the overall emergency response picture (e.g., how a local or tribal ORO's plans/procedures fit into the state's plans/procedures).

REFERENCES

- FEMA Comprehensive Preparedness Guide 101, *Developing and Maintaining Emergency Operations Plans*, Version 2.0, November 2010.
- National Incident Management System, Third Edition, October 2017.
- National Response Framework, Third Edition, June 2016.
- Nuclear/Radiological Incident Annex to the Response and Recovery Federal Interagency Operational Plans, October 2016.

EVALUATION CRITERION A.1.b

Each organization's emergency plan illustrates these interrelationships in a block diagram.

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

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

- i. An illustration of each organization and its relationship to the total emergency response effort.¹⁷

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.

¹⁷ For a sample Incident Command System organization chart, see ICS Form 207, Organizational Chart.

REFERENCES

- FEMA Comprehensive Preparedness Guide 101, *Developing and Maintaining Emergency Operations Plans*, Version 2.0, November 2010.
- National Incident Management System, Third Edition, October 2017.
- National Response Framework, Third Edition, June 2016.
- Nuclear/Radiological Incident Annex to the Response and Recovery Federal Interagency Operational Plans, October 2016.

EVALUATION CRITERION A.1.c

Each organization identifies the individual, by title/position, who will be in charge of the emergency response.

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

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

- i. The individual, by title/position, in charge of the emergency response; and
- ii. The individual, by title/position, coordinating response activities under the authority of the individual in charge.

EXPLANATION

Plans/procedures specify the individual, by title/position, in charge and with the authority to direct emergency response activities. Plans/procedures include a chain-of-command to establish a line of authority and responsibility, and how these individuals interact with incident command.

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

REFERENCES

- FEMA Comprehensive Preparedness Guide 101, *Developing and Maintaining Emergency Operations Plans*, Version 2.0, November 2010.
- National Incident Management System, Third Edition, October 2017.
- National Response Framework, Third Edition, June 2016.

EVALUATION CRITERION A.2

References to the applicable acts, codes, or statutes that provide the legal basis for emergency response-related authorities, including those that delegate responsibility and authority to state, local, and tribal governments are included. Each emergency plan indicates who may declare a “State of Emergency” and the powers that ensue.

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

TO MEET THE INTENT OF EVALUATION CRITERION A.2, ORO PLANS/PROCEDURES INCLUDE:

- i. The legal authority to assign lead responsibility for emergency preparedness to a particular agency;
- ii. The legal authority to delegate responsibility and authority for preparedness and response; and
- iii. The legal authority to declare a “state of emergency” (or “state of disaster emergency”) and what special powers may ensue.

EXPLANATION

The plans/procedures give the citation of the relevant state, local, or tribal statute(s). Plans include the legal authority that assigns lead emergency preparedness responsibilities to an appropriate state, local, or tribal agency (e.g., the state's Emergency Management Agency). Plans include the legal authority to delegate responsibility and authority for preparedness and response (e.g., the Governor may designate the state emergency management director to be the responsible and authoritative point of contact to implement emergency response activities).

Plans/procedures indicate who has the legal authority to declare a "state of emergency" or "state of disaster emergency" (e.g., Governor or other official, or local or tribal official).

REFERENCES

- FEMA Comprehensive Preparedness Guide 101, *Developing and Maintaining Emergency Operations Plans*, Version 2.0, November 2010.
- National Incident Management System, Third Edition, October 2017.
- National Response Framework, Third Edition, June 2016.

EVALUATION CRITERION A.3

Each organization specifies the key individual(s), by title/position, responsible for the following functions, as applicable to that organization: command and control, alert 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.

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

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

- Identification of key individuals, by title/position, with emergency response roles;
- A description of the identified key individuals' assigned functions by functional areas; and
- A visual representation of individuals' assigned functions by functional area.

EXPLANATION

Both principal and support OROs identify key individuals, by title/position, with an emergency response role and describe their responsibilities and functions during a response to an incident. For OROs that have adopted NIMS/ICS, these descriptions identify individuals who will carry out fundamental tasks and functions applicable to their organization, including the five ICS functional areas.

Plans include a representation of individuals' responsibilities, including who will carry out fundamental tasks and functions applicable to their organizations; an example of this is through the development of a matrix. A sample matrix can be found in Exhibit II-1. This matrix outlines the five ICS functional areas with example functions to be performed during a response to an NPP incident. This sample matrix is primarily presented from a local jurisdiction's perspective; however, OROs are able to amend the matrix to accommodate where state responsibilities fit into ORO plans and procedures, including adding applicable organizations that may provide assistance in the response effort, other than what is typically provided by the principal and support organizations.

REFERENCES

- FEMA Comprehensive Preparedness Guide 101, *Developing and Maintaining Emergency Operations Plans*, Version 2.0, November 2010.
- National Incident Management System, Third Edition, October 2017.
- National Response Framework, Third Edition, June 2016.

Exhibit II-1: Sample Functional Responsibilities Matrix

Incident Command System Functional Area and Function		Organization												
		County Commissioners	Dispatch Officers	Health District Officials	County Emergency Manager	Fire Services Personnel	City Police	County Sheriff's Office Personnel	County Public Works Personnel	School District Personnel	Red Cross Volunteers	Communication Coordinator	City Officials	Public Information Officer
Command & Control	Command & Control	P			C									
	Alerting Notification	P			S		S	S						
	Communications		S								P			
	Protective Response	P			C							C		
	Public Information				C								P	
Operations	Fire & Rescue					P	S	S						
	Traffic Control					S	S	P						
	Emergency Medical Service					P								
	Accident Assessment	S		P	C	S	S	S	S					
	Law Enforcement							P						
	Public Health			P						S				
	Sanitation			P										
Logistics	Social Services				C						P			
	Transportation				C					P				
	Mass Care Facility				C					S	P			
	Evacuation	P		S	C					S	S	S	S	

KEY: P = Principal Organization S = Support Organization C = Cooperating Organization

Incident Command System Functional Area and Function		Organization												
		County Commissioners	Dispatch Officers	Health District Officials	County Emergency Manager	Fire Services Personnel	City Police	County Sheriff's Office Personnel	County Public Works Personnel	School District Personnel	Red Cross Volunteers	Communication Coordinator	City Officials	Public Information Officer
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
Finance/Administration	Resource Management				P									C
	Compensation/Claims													P
	Procurement/Cost													P
	Time													P

KEY:¹⁸ P = Principal Organization¹⁹ S = Support Organization²⁰ C = Cooperating Organization

¹⁸ Definitions for Principal, Support, and Cooperating Organization are available in the Glossary of this Manual.

¹⁹ In National Incident Management System (October 2017), principal organization is synonymous with Authority Having Jurisdiction (AHJ). The AHJ is an entity that can create and administer processes to qualify, certify, and credential personnel for incident-related positions. AHJs include state, tribal, or Federal government departments and agencies, training commissions, NGOs, or companies, as well as local organizations such as police, fire, public health, or public works departments.

²⁰ In National Incident Management System (October 2017), supporting organization is synonymous with Assisting Agency. The Assisting Agency or organization providing personnel, services, or other resources to the agency with direct responsibility for incident management.

EVALUATION CRITERION A.4

Written agreements with the support organizations having an emergency response role within the EPZs are referenced. The agreements describe the concept of operations, emergency response measures to be provided, mutually acceptable criteria for their implementation, and arrangements for exchange of information.

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

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

- i. A list of support organizations and the type of assistance, including capabilities and resources they will provide;
- ii. (Or reference) Applicable written agreements between the licensee and ORO, including arrangements for NPP site access, if appropriate;
- iii. Written agreements annotate the services to be provided through the agreement and how those services will be activated;
- iv. Written agreements by reference or in a suitable appendix; and
- v. A statement that written agreements are reviewed annually to verify their validity, including developing new written agreements and updating signatories as necessary.

EXPLANATION

Responding to an incident involves a variety of capabilities. Licensees and OROs may establish written agreements (e.g., letter of agreement [LOA] or MOU) with supporting organizations to delineate the type of support and assistance they can provide. Examples of supporting organizations may include other OROs; the licensee; laboratories; transportation providers (e.g., bus companies, ambulances); vendors providing resources or other commercial services (e.g., tow trucks); and medical/hospital facilities. Government agencies whose functions are inherently emergency response-oriented do not require written agreements. Intergovernmental support is increasingly being secured through mutual assistance compacts and/or legislation. However, for those support arrangements between private-sector entities and jurisdictions that are not covered by mutual assistance compacts, written agreements are needed.

Written agreements are needed for primary and back-up resources that OROs will utilize during an incident. 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.

a. Contents of Written Agreements

ORO plans/procedures reference written agreements with support organizations. Contents of written agreements indicate what service(s) will be provided, what organization will provide the service(s), and the point of contact. Written agreements identify the location of the resources to be provided; the 24-hour points of contact for notification and mobilization; and include name, signature, and date of the parties authorized to execute the written agreement. Written agreements also state that OROs ensure all applicable emergency response personnel activated by the agreement receive radiological emergency response training. Written agreements state that the provider will supply the services as described for emergencies and for training, drills, and exercises, as necessary. As appropriate, written agreements also refer to procedures for authorizing ORO responders to access the NPP site and other affected areas.

Emergency Response Support and Resources Agreements: In some instances, such as during a hostile action-based (HAB) incident, OROs may not have sufficient personnel to simultaneously support onsite law enforcement and offsite alert and notification. If ORO resource demands are unusually high, OROs may enter into mutual aid agreements with neighboring jurisdictions and private sector entities to identify alternate personnel to supplement local resources.

Accident Assessment Agreements: Written agreements clearly delineate activities performed by non-governmental organizations (e.g., licensee, university, contractor, and mutual aid), such as collection of air samples within the plume exposure pathway EPZ and determination of present airborne radioiodine concentrations. If field monitoring teams (FMTs) are composed of a mixture of government and non-government resources, these details are also described.

Medical and Public Health Support Agreements: Specifically for medical and public health support, OROs obtain written agreements from the hospitals/medical facilities, medical transportation providers, and external technical staff that are not employed or contracted by the hospital/medical facility (e.g., health physicists, radiological control technicians) and include the agreements in the plans/procedures as defined in evaluation criterion L.1 for primary and back-up hospitals and/or evaluation criterion L.4 for transportation. Information in written agreements include the hospital/medical facility name; location of facility; type of capabilities; and approximate number of patients who can be treated. Written agreements contain assurances that the providers have adequate technical information (e.g., treatment protocols) and treatment capabilities for handling potentially contaminated, injured, and/or exposed individuals. Written agreements with transportation providers include the organization's name, type of services provided, and maximum number of vehicles that can be provided.

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 unsuccessful 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).

Laboratories: Written agreements include a strategy to prioritize or de-conflict the order in which samples will be processed. This is to ensure that priority is appropriately provided should an incident overtax a single laboratory. See evaluation criterion C.4.

b. Maintenance of Written Agreements

Written agreements may be provided as an appendix to the plan, or the plan itself may contain a descriptive list of the agreements that are supplemented with a signature page 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. If the plans/procedures incorporate written agreements by reference, they include a signed cover sheet certifying the validity of the materials referenced. OROs keep the original written agreement on file, available for inspection by FEMA.

c. Annual Review of Written Agreements

Regardless of how the plans/procedures include the written agreements, states certify their current status annually, typically through the ALC (see also evaluation criterion P.4). Written agreements either specify an expiration date or contain a statement that the agreement remains in effect until canceled by one or both parties. OROs maintain a list of all written agreements and ask for new written agreements or updated signatories if (1) the written agreement expires, or (2) the authorities of the signatories are foreclosed by reorganizations or statutory limitations. The state reports on existing or new written agreements in the ALC submission with a statement that the written agreements have been reviewed to ensure all information is current and accurate (see Part IV, Section L). FEMA may also review written agreements during SAVs and/or plan reviews.

REFERENCES

- FEMA Comprehensive Preparedness Guide 101, *Developing and Maintaining Emergency Operations Plans*, Version 2.0, November 2010.
- National Incident Management System, Third Edition, October 2017.
- National Response Framework, Third Edition, June 2016.
- Nuclear/Radiological Incident Annex to the Response and Recovery Federal Interagency Operational Plans, October 2016.

EVALUATION CRITERION A.5

Each principal response organization is capable of continuous operations for a protracted period. The principal response organization specifies the individual, by title/position, who is responsible for ensuring continuity of resources (technical, administrative, and material).

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

TO MEET THE INTENT OF EVALUATION CRITERION A.5, ORO PLANS/PROCEDURES INCLUDE:

- i. The individual(s), by title/position, responsible for ensuring continuity of resources in support of 24-hour operations;
- ii. A reference to a roster that identifies at least two shifts of key staff, by title/position;
- iii. The individual(s), by title/position, responsible for maintaining the roster, how it will be maintained, and where the roster is located; and
- iv. The shift period and provisions for outgoing staff to brief the incoming staff on the status of the emergency and response activities occurring.

EXPLANATION

Plans/procedures describe provisions for maintaining the following essential emergency functions around the clock, for a protracted period: command and control, alert and notification, communications, public information, accident assessment, public health and sanitation, social services, fire and rescue, traffic control, emergency medical services (EMS), law enforcement, transportation, protective response (including authority to request Federal assistance and to initiate other protective actions), and radiological exposure control.

Plans/procedures specify the individual(s), by title/position, responsible for ensuring continuity of resources in support of 24-hour operations. Plans/procedures reference a roster that identifies at least two shifts of key staff and specifies the individual, by title/position, to maintain the roster. A description of where the roster is located and provisions for how it will be maintained are included in plans/procedures.

Plans/procedures describe the shift period (e.g., 8- or 12-hours) and provisions for outgoing staff to brief incoming staff on the status of the emergency and response activities.

REFERENCES

- FEMA Comprehensive Preparedness Guide 101, *Developing and Maintaining Emergency Operations Plans*, Version 2.0, November 2010.
- *National Incident Management System*, Third Edition, October 2017.
- *National Response Framework*, Third Edition, June 2016.
- *Nuclear/Radiological Incident Annex to the Response and Recovery Federal Interagency Operational Plans*, October 2016.

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 for this planning standard, it is important that OROs understand the onsite response organization's structure and authority. Table B-1 referenced in evaluation criterion B.3 can be found in NUREG-0654/FEMA-REP-1, Rev. 2.

EVALUATION CRITERION B.1

The emergency plan specifies how the requirements of 10 CFR 50.47(b)(2) and the applicable sections of Appendix E to 10 CFR Part 50 are met.

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

EVALUATION CRITERION B.1.a

The site-specific emergency response organization (ERO) is developed. Note that while other site programs, such as operations, fire response, rescue and first aid, and security, may be controlled via other licensing documents, it is only when these personnel are assigned EP functions that they become part of this regulatory standard. Consideration is given to ensure that EP functions are not assigned to individuals who may have difficulties performing their EP function(s) simultaneously with their other assigned (non-EP) duties. Appendix E to 10 CFR Part 50 requires licensees to perform an on-shift staffing analysis to ensure on-shift staff can support the EP functions assigned, as well as other assigned duties.

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

EVALUATION CRITERION B.2

An individual is designated as the on-shift emergency coordinator (individual title may vary) who has the authority and responsibility to immediately and unilaterally initiate any emergency response measures, including approving protective action recommendations (PARs) to be disseminated to authorities responsible for implementing offsite emergency response measures.

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

EVALUATION CRITERION B.2.a

The functional responsibilities assigned to the ERO are established and the responsibilities that may not be delegated to other members of the ERO are clearly specified in the emergency plan.

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

EVALUATION CRITERION B.3

A table is developed depicting the site-specific on-shift staffing plan, as well as the ERO staffing augmentation plan. Table B-1, "Emergency Response Organization (ERO) Staffing and Augmentation Plan," provides a model for licensees to consider.

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

EVALUATION CRITERION B.4

The interfaces between and among the licensee functional areas of emergency activity, local services support, and state, local, and tribal government organizations are identified. The information includes all licensee emergency response facilities. A block diagram is preferred for ease of use, but not required.

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

EVALUATION CRITERION B.5

The external organizations, including contractors, that may be requested to provide technical assistance to and augmentation of the ERO, as applicable, are specified.

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

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 EOF have been made, and other organizations capable of augmenting the planned response have been identified.

EVALUATION CRITERION C.1

Emergency response support and resources provided to the licensee's EOF, as agreed upon, are described.

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

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

- i. Whether an ORO liaison(s) will be provided to the licensee's emergency operations facility (EOF), and if so, the individual(s), by title/position, that would be dispatched;
- ii. The emergency response support role the liaison(s) will be fulfilling while at EOF; and
- iii. The resources, if any, the OROs will provide to the licensee's EOF.

EXPLANATION

During an incident, OROs may send personnel to the licensee's EOF to act as liaisons. Typically, these are technical liaisons to coordinate/communicate dose assessment and field monitoring activities with licensee personnel. However, emergency response support and resources are not limited to a technical liaison role should other needs be requested. Any requested needs, whether personnel or resources that will be provided to the EOF are described in the plans/procedures.

REFERENCES

- National Incident Management System, Third Edition, October 2017.

EVALUATION CRITERION C.2

Provisions made for additional emergency response support and resources are described and include the following:

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

EVALUATION CRITERION C.2.a

The individual(s), by title/position, authorized to request emergency response support and resources from responding organizations.

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

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

- i. The individual(s), by title/position, authorized to request emergency response support and resources.

EXPLANATION

Plans/procedures specify the individual(s), by title/position, authorized to request emergency response support and resources. Key officials with the authority to request support from any/all levels of government, non-governmental organizations (NGOs), and/or the private sector should be identified.

REFERENCES

- National Incident Management System, Third Edition, October 2017.
- National Response Framework, Third Edition, June 2016.
- Nuclear/Radiological Incident Annex to the Response and Recovery Federal Interagency Operational Plans, October 2016.
- NUREG-1442/FEMA-REP-17, Rev. 1, Emergency Response Resources Guide for Nuclear Power Plant Emergencies, July 1992.

EVALUATION CRITERION C.2.b

(1) Each organization from which emergency response support and/or resources may be requested, (2) the circumstance(s) in which the emergency response support and/or resources would be required, (3) the process for requesting needed emergency response support and/or resources, (4) categories of capabilities and/or resources expected to be provided, (5) when the expected emergency response support and/or resources would be available once requested, and (6) how integration would occur.

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

TO MEET THE INTENT OF EVALUATION CRITERION C.2.b, ORO PLANS/PROCEDURES INCLUDE:

- i. A process for identifying potential shortfalls in capabilities and resources;
- ii. The organization(s) from which emergency response support and/or resources may be requested;
- iii. Circumstances under which the emergency response support and/or resources would be needed;
- iv. The process for requesting needed emergency response support and/or resources;
- v. Categories of capabilities and/or resources expected to be provided;
- vi. The amount of time expected for emergency response support and/or resources to be available once requested; and
- vii. How incoming emergency response support and/or resources will integrate with response efforts.

EXPLANATION

Plans/procedures include the process by which OROs assess and plan for potential shortfalls in capabilities and resources (e.g., equipment, personnel, facilities, etc.). Information regarding the emergency response support and resources to be provided include the providing organization, circumstances under which a request would be made, specific capabilities and resources to be provided, and an estimate of the expected time of arrival once requested in order to provide a general planning timeframe. This information should be provided for all types of emergency response support and resources that a jurisdiction may expect during an incident, to include Federal resources.

Plans/procedures address how incoming emergency response support and resources will integrate with the response efforts. This may include, but is not limited to, access to certain local or nearby resources, such as clearance information and use of airfields, communications equipment, local housing, local personnel to provide information and assistance with the unique features of the area.

The Nuclear/Radiological Incident Annex to the Response and Recovery Federal Interagency Operational Plans describes available Federal assistance.

REFERENCES

- National Incident Management System, Third Edition, October 2017.
- National Response Framework, Third Edition, June 2016.
- Nuclear/Radiological Incident Annex to the Response and Recovery Federal Interagency Operational Plans, October 2016.
- NUREG-1442/FEMA-REP-17, Rev. 1, Emergency Response Resources Guide for Nuclear Power Plant Emergencies, July 1992.

EVALUATION CRITERION C.2.c

Coordination of NPP site access and support for external organizations that have agreed to provide requested emergency response support and resources.

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

TO MEET THE INTENT OF EVALUATION CRITERION C.2.c, ORO PLANS/PROCEDURES INCLUDE:

- i. Provisions to allow ORO organizations, including mutual aid/supplemental support and resources, access to the NPP;
- ii. Identification of means for granting access to personnel from each organization who are authorized site access resources; and
- iii. Provisions for coordination between in-bound response resources and evacuation efforts.

EXPLANATION

Plans/procedures for allowing site access are coordinated with the licensee and include an estimated response time for requested personnel and equipment to report to the NPP. This information may be considered safeguarded information and should be treated as such.

Plans/procedures also include provisions to ensure that inbound response resources do not become an impediment to evacuation and vice versa and include provisions for removal of impediments to in-bound responders.

REFERENCES

- National Incident Management System, Third Edition, October 2017.
- Nuclear/Radiological Incident Annex to the Response and Recovery Federal Interagency Operational Plans, October 2016.

EVALUATION CRITERION C.2.d

Agreements between licensees and local agencies for law enforcement, medical and ambulance services, fire, hospital support, and other support.

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

TO MEET THE INTENT OF EVALUATION CRITERION C.2.d, ORO PLANS/PROCEDURES INCLUDE:

- i. A list of external organizations that have agreed to provide requested emergency response support to the NPP, as well as the type of support they will provide.

EXPLANATION

Plans/procedures provide a list of all external organizations that have emergency response support responsibilities onsite at the NPP as well as an explanation of the responsibilities each organization has agreed to provide. Any agreement to provide emergency response support onsite should be identified; these agreements need only be referenced in the emergency plan.

REFERENCES

- National Incident Management System, Third Edition, October 2017.
- Nuclear/Radiological Incident Annex to the Response and Recovery Federal Interagency Operational Plans, October 2016.

EVALUATION CRITERION C.3

The capability of each principal organization to coordinate with other principal organizations leading the incident response is described.

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

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

- i. Identification of principal organizations;
- ii. Roles and responsibilities of principal organizations based on their authorities;
- iii. A description of how coordination and integration between principal organizations will occur; and
- iv. Whether a representative(s) from another organization will be provided to ORO operational centers (e.g., a county emergency operations center [EOC]) to act as a liaison(s), and if so, identification of the individual(s), by title/position, that would be dispatched.

EXPLANATION

Principal organizations are defined as the licensee and any state, local, and tribal government agency, department, or executive office having a major or lead role in emergency planning and preparedness. The principal organizations that may be called upon to provide additional emergency response support and/or resources to those leading the emergency response should be clearly identified (e.g., DOE's Federal Radiological Monitoring and Assessment Center [FRMAC] or the FBI). Further, supporting organizations include any Federal departments and agencies (e.g., FEMA, NRC, and FBI) or private-sector or volunteer organizations (e.g., ARC, RACES with identified supporting response responsibilities). Additionally, the roles/responsibilities and associated authorities (i.e., legal authorities related to an agency's ability to lead certain actions or portions of the response) of these principal organizations should be clearly defined in plans and procedures. In line with describing the authorities and roles/responsibilities of incoming principal organizations, the ways in which coordination and integration amongst the principal organizations leading the emergency response may need to occur are described in plans/procedures.

During an incident, representative(s) from another organization(s), (e.g., licensee; Federal, state, local, and tribal government, private sector, or NGO) may send a representative(s) to an ORO operational center (e.g., a county EOC) to act as liaisons. For example, an NPP may send a representative(s) to a county EOC or the Incident Command Post (ICP) to help coordinate equipment and resources. If applicable, plans/procedures identify the individual(s), by title/position, who would be dispatched.

REFERENCES

- National Incident Management System, Third Edition, October 2017.
- Nuclear/Radiological Incident Annex to the Response and Recovery Federal Interagency Operational Plans, October 2016.

EVALUATION CRITERION C.4

Radiological laboratories, their general capabilities, and expected availability to provide radiological monitoring analysis services that can be used in an emergency are described. Plans to augment the identified radiological laboratories are described.

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

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

- i. The laboratories qualified to analyze samples of potentially contaminated materials;
- ii. A description of the radiochemical and analytical capabilities of each laboratory;

- iii. The laboratories' locations and expected availability of each laboratory to provide services; and
- iv. The number of samples the laboratories would be able to process in a given period.

EXPLANATION

OROs with responsibility for arranging laboratory services identify available laboratories and their capabilities (e.g., the ability to analyze milk and other human food, soil samples, water samples, ambient monitoring samples, etc.). Laboratories should have the expectation to coordinate with one another in the event of a real-world emergency. The intent of this evaluation criterion is to ensure support organizations are identified and written agreements have been made to provide support when needed. These agreements need only to be identified in the emergency plan. Plans/procedures include the location(s) of identified radiological laboratories, as well as their readiness to provide radiological monitoring and analysis services, should an incident occur and the number of samples laboratories would be able to process in a given period.

The state is still expected to process and analyze samples and maintain control of data.

REFERENCES

- National Incident Management System, Third Edition, October 2017.
- Nuclear/Radiological Incident Annex to the Response and Recovery Federal Interagency Operational Plans, October 2016.

EVALUATION CRITERION C.5

Arrangements are described for integrating the licensee's response with the NRC Headquarters and regional incident response centers and, when dispatched, the NRC's site response team.

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

EVALUATION CRITERION C.5.a

The activation process for the NRC's emergency response data system (ERDS) during an emergency is described.

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

EVALUATION CRITERION C.5.b

Provisions to continuously maintain open communications lines with the NRC, when requested, are described.

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

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 facility licensees for determinations of minimum initial offsite response measures.

EVALUATION CRITERION D.1

A standard emergency classification and action level scheme is established and maintained. The scheme provides detailed EALs for each of the four ECLs in Section IV.C.1 of Appendix E to 10 CFR Part 50.

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

EVALUATION CRITERION D.1.a

The EALs are developed using guidance provided or endorsed by the NRC that is applicable to the reactor design.

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

EVALUATION CRITERION D.1.b

The initial emergency classification and action level scheme is discussed and agreed to by the licensee and OROs, and approved by the NRC. Thereafter, the scheme is reviewed with OROs on an annual basis.

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

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

- i. Reference the standard ECLs;
- ii. Acknowledgment that the ECL system will form the basis for determining the level of response to an incident that will be coordinated with the licensee; and
- iii. Agreement on the initial ECL scheme and an annual review of the scheme.

EXPLANATION

OROs should coordinate with the licensee to create the initial emergency classification and action level scheme. Once the scheme is approved by the NRC, the OROs and licensees should work together to review and revise the scheme, if needed, to ensure appropriate coordination and alignment of expected actions, etc. on an annual basis. The ECL portion of the scheme agreed to by the licensee and OROs, and approved by the NRC, should be incorporated into plans/procedures.

The purpose of the ECL system is to classify the incident by level of severity to allow for greater levels of response as the significance of the incident increases. As described in the Glossary of the latest NUREG-0654/FEMA-REP-1, Rev. 2 and this Manual, the four standard ECLs include:

- **Notification of Unusual Event (NOUE):** an ECL indicating that events are in progress or have occurred which indicate a potential degradation of the level of safety of the plant 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. This term is sometimes shortened to Unusual Event (UE) or other similar site-specific terminology. The terms Notification of Unusual Event, NOUE, Unusual Event, and UE are used interchangeably.

- **Alert:** an ECL indicating that events are in progress or have occurred which involve an actual or potential substantial degradation of the level of safety of the plant or a security event that involves probable life threatening risk to site personnel or damage to site equipment because of hostile action. Any releases are expected to be limited to small fractions of the EPA PAG exposure levels.
- **Site Area Emergency (SAE):** an ECL indicating that events are in progress or have occurred which involve an actual or likely major failure of plant functions needed for protection of the public or hostile action that results 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. Any releases are not expected to result in exposure levels which exceed EPA PAG exposure levels beyond the site boundary.
- **General Emergency (GE):** an ECL indicating that events are in progress or have occurred which involve actual or imminent substantial core degradation or melting with potential for loss of containment integrity or hostile action that results in an actual loss of physical control of the facility. Releases can be reasonably expected to exceed EPA PAG exposure levels offsite for more than the immediate site area.

REFERENCES

- NEI 99-01, Rev. 6, *Development of Emergency Action Levels for Non-Passive Reactors*, November 2012.

EVALUATION CRITERION D.2

The capability to assess, classify, and declare the emergency condition within 15 minutes after the availability of indications to NPP operators that an EAL has been met or exceeded is described.

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

EVALUATION CRITERION D.3

A summary of emergency response measures to be taken for each ECL is provided. The detailed emergency response measures are described in implementing procedures.

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

EVALUATION CRITERION D.4

Emergency response measures based on the ECL declared by the licensee and applicable offsite conditions are described.

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

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

- i. The minimum emergency response measures to be taken to protect the public at each ECL, given the offsite conditions at the time of the emergency.

EXPLANATION

Plans/procedures describe each ECL, its purpose, and appropriate emergency response measures to be taken by the OROs at each ECL. These emergency response measures are considered to be the minimum measures taken at the time of the incident, after consideration is given to other factors and offsite conditions (e.g., weather, road conditions, and threats). Planners should be cognizant that guidance on preferred protective actions may continuously evolve during a large-scale

incident. Additionally, evaluation criteria within planning standard J address a protective action logic development tool to assist licensees in developing site specific PAR procedures, in coordination with OROs. This protective action logic development tool can also be used to assist OROs with decision-making for offsite protective actions.

REFERENCES

- NUREG/CR-6953/SAND2010-2806P, Vol. 3, Review of NUREG-0654, Supplement 3, 'Criteria for Protective Action Recommendations for Severe Accidents' — Technical Basis for Protective Action Strategies, August 2010.
- Nuclear/Radiological Incident Annex to the Response and Recovery Federal Interagency Operational Plans, October 2016.

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 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 EPZ have been established.

EVALUATION CRITERION E.1

The mutually agreeable process for direct and prompt notification of response organizations, aligned with the emergency classification and action level scheme, is described.

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

TO MEET THE INTENT OF EVALUATION CRITERION E.1, ORO PLANS/PROCEDURES INCLUDE:

- i. The agreed upon process for direct and prompt notification to both response organizations and the designated offsite 24-hour warning point;
- ii. A statement that the agreed upon notification process is aligned with the emergency classification and action level scheme as described in D.1.b;
- iii. The process for when the initial notification originates from an entity other than the licensee; and
- iv. The agreed upon process for disseminating subsequent notifications from the licensee and/or ORO to other offsite organizations.

EXPLANATION

Plans/procedures describe the process for disseminating the initial notification, consistent with the ECL, from the licensee to a designated offsite 24-hour warning point. The location of the offsite 24-hour warning point is described within plans/procedures. If information included in the notification from the licensee to the offsite 24-hour warning point is recorded on a notification form, the plans/procedures contain a copy of this form. If the initial notification from licensee to the 24-hour warning point is over a non-secure system, message verification (e.g., via a return call) is necessary. If disseminated over a dedicated system (i.e., a system capable of being used only by a known, limited number of organizations), OROs may choose whether to verify receipt of notification.

As stated in 10 CFR Part 50, Appendix E, the licensee must have the capability to notify OROs within 15 minutes of declaring an incident. The licensee and applicable ORO's plans/procedures capture the mutually agreeable notification process of how all response organizations are notified when an emergency classification and action level are activated (this includes the initial notification and any subsequent notifications).

When an emergency classification and action level are activated, the licensee disseminates an initial notification to a designated offsite 24-hour warning point (e.g., fire or police department dispatch, 9-1-1 emergency center), which in turn initiates a notification chain to all appropriate response organizations. Once response organizations are notified, notification to component agencies and support organizations are initiated, as set forth in the ORO's plans/procedures. Some OROs may 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). As a best practice, consideration is also given to contacting other state and/or jurisdictions outside the plume exposure pathway EPZ and keeping them apprised of the situation as it progresses. The agreed upon initial notification process is aligned with the emergency classification and action level scheme, which are:

Notification of Unusual Event (NOUE). Events are in progress or have occurred, which indicate a potential degradation of the level of safety of the plant. No releases of radioactive material requiring offsite response or monitoring are expected unless further degradation of safety system occurs. The purpose of an offsite notification is to (1) assure that the first step in any response later found to be necessary has been carried out, (2) bring the operating staff to a state of readiness, and (3) provide systematic handling of event information and decision-making.

Alert. Events are in progress or have occurred which involve an actual or potential substantial degradation of the level of safety of the plant. Any radiological releases expected to be limited to small fractions of the EPA Protective Action Guideline exposure levels. The purpose of an offsite alert is to (1) assure that emergency personnel are readily available to respond if the situation becomes more serious or to perform confirmatory radiation monitoring, and (2) provide offsite authorities current status information.

Site Area Emergency (SAE). Events are in progress or have occurred which involve actual or likely major failures of plant functions needed for protection of the public. Any radiological releases not expected to exceed EPA PAG exposure levels except near the site boundary. The purpose of the SAE declaration is to (1) assure that response centers are manned, (2) assure that monitoring teams are dispatched, (3) assure that personnel needed for evacuation of near-site areas are at duty stations if the situation becomes more serious, (4) provide consultation with offsite authorities, and (5) provide updates for the public through offsite authorities.

General Emergency (GE). Events are in progress or have occurred which involve actual or imminent substantial core degradation or melting with potential for loss of containment integrity. Radiological releases can be reasonably expected to exceed EPA Protective Action Guideline exposure levels offsite for more than the immediate site area. The purpose of the GE declaration is to (1) initiate predetermined protective actions for the public, (2) provide continuous assessment of information from licensee and offsite organization measurements, (3) initiate additional measures as indicated by actual or potential radiological releases, (4) provide consultation with offsite authorities, and (5) provide updates for the public through offsite authorities.

In instances when the initial notification originates from an entity other than the licensee, such as during a HAB incident, notifications may not follow standard licensee-to-ORO methods, as described above. For example, local law enforcement agency points of contact may be notified by the licensee's site security department of an imminent or actual hostile action against the NPP site prior to the licensee declaring an incident. In addition, OROs may receive "pre-incident" information from various external sources (e.g., intelligence sources, airports, Federal/state law enforcement agencies), rather than receiving initial notification from the licensee. In a HAB incident, a licensee notifies OROs in accordance with onsite plans/procedures, irrespective of emergency classification level. Plans/procedures include the agreed upon process for when the initial notification originates from an entity other than the licensee.

Plans/procedures include the agreed upon process for disseminating subsequent notifications from the licensee and/or ORO to other offsite organizations.

REFERENCES

- *Comprehensive Preparedness Guide 101: Developing and Maintaining Emergency Operations Plans, Version 2.0*, November 2010.
- *National Incident Management System*, January 2019.

EVALUATION CRITERION E.1.a

Provisions for notification of response organizations are established, including the means for verification of messages.

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

TO MEET THE INTENT OF EVALUATION CRITERION E.1.a, ORO PLANS/PROCEDURES INCLUDE:

- i. Method for verifying the initial notification from the licensee to the 24-hour warning point, if applicable;
- ii. Provisions for notifying all appropriate response organizations, including specific notifications made at each ECL;
- iii. The individual(s), by title/position, responsible for notifying emergency response personnel within their organization; and
- iv. Individual(s), by title/position, responsible for disseminating subsequent notifications.

EXPLANATION

Plans/procedures have clear and consistent means for providing notification to the designated 24-hour warning point and all applicable response organizations.

a. Initial Notification Procedures

Once the offsite 24-hour warning point verifies the initial notification from the licensee, plans/procedures include the notification process for all appropriate response organizations. This includes identifying an individual(s), by title/position, who is responsible for notifying all applicable response organizations. A diagram, such as a call-down list, illustrating the initial notification process flow to response organizations may supplement a plan/procedure description of this process.

Upon notifying the designated individuals at each response organization, ORO plans/procedures document the process of how appropriate emergency response personnel within their organization are alerted, notified, and mobilized to support the organizations' response roles. This process includes specifying the individual(s), by title/position, responsible for notifying each staff member, either by including a notification call list or making reference to such a list in the ORO's plans/procedures.

During a HAB incident, there are special considerations to consider. The licensee notification pathways (to initial warning points and local law enforcement agencies) serve different and distinct purposes and may not occur in parallel based on progression of the HAB incident. Licensee notifications to local law enforcement may include sensitive information. ORO plans/procedures address the challenge of ensuring that all appropriate parties who need to take immediate action are included when multiple-pathway notification occurs. If local law enforcement agencies receive the initial notification or the licensee's initial response to a HAB incident at the NPP is in direct interaction with local law enforcement, this could result in unintentional 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 plans/procedures include a notification process that works in all directions (not just from the 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 centers, emergency management agencies, local law enforcement agencies). If law enforcement responds to a HAB incident that has potential to impact an NPP, plans/procedures include provisions to notify the site and appropriate emergency management agencies.

b. Subsequent Notification Procedures

The plans/procedures may call for subsequent notifications to locations other than the 24-hour 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 24-hour warning point; or that the offsite 24-hour warning point's responsibility

for passing along notifications may end after it places a call to the state and county emergency management agencies. Plans/procedures describe the process for disseminating subsequent notifications from the licensee and/or ORO to other applicable offsite organizations, including the individual(s), by title/position, responsible for disseminating subsequent notifications.

REFERENCES

- Comprehensive Preparedness Guide 101: Developing and Maintaining Emergency Operations Plans, Version 2.0, November 2010.
- National Incident Management System, January 2019.

EVALUATION CRITERION E.1.b

The capability to notify responsible OROs within 15 minutes and the NRC within 60 minutes is described.

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

EVALUATION CRITERION E.2

The alert and notification systems (ANSs) used to alert and notify the general public within the plume exposure pathway EPZ and methods of activation are described. This description includes the administrative and physical means, the time required for notifying and providing prompt instructions to the public within the plume exposure pathway EPZ, and the organizations or titles/positions responsible for activating the system.

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

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

- i. A statement that the ANS is capable of meeting the 15-minute design objective;
- ii. A description of the 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 (if applicable), and their respective point(s) of activation;
- iii. A description of the administrative means of alert and notification, including:
 - a. Title of the organizations or individuals responsible for: (1) making the decision to activate the ANS and (2) activating the system; and
 - b. ANS activation procedures and associated time needed to implement these procedures.
- iv. List of broadcast stations and/or other systems (e.g., Integrated Public Alert and Warning System [IPAWS], National Weather Service (NWS), tone alert radios, route alerting) used to provide emergency instructions to the public;
- v. Describe the broadcast stations' or systems' capability to participate in the public notification process;
- vi. If broadcast stations are used to activate the system, a description of individual responsibilities from each broadcast station and system, and documentation agreed upon commitments (e.g., MOUs and/or LOAs) to honor their responsibilities in a radiological incident;
- vii. Identification of the broadcast station and system points of contact, by title/position, who are accessible 24 hours a day, 7 days a week and identification of an alternate station if the selected station does not have backup power supply;
- viii. Provisions for special news broadcasts to disseminate supplemental information to the emergency alert system (EAS) message; and
- ix. The interval for broadcasting official information statements.

EXPLANATION

The plans/procedures must outline the minimally acceptable design objectives to allow FEMA to make its assessment based on the capabilities of the ANS and not just the technical specifications. This criterion addresses the means to alert and notify the public within the plume exposure pathway EPZ that there is an incident at the NPP. Alert refers to the process used to get the attention of the public; notification is the detailed information and/or instructions from the officials following the alert signal. This criterion covers both the physical and administrative means for alert and notification of the public. The physical means of alert and notification include addresses and the methods and equipment needed for alerting the public; the administrative means describes the organizations and/or people responsible for alert and notification, and the responsibilities for each organization and/or person, involved in the alert and notification sequence. According to the Federal Communications Commission (FCC), EAS stations must maintain a 24-hour capability to interrupt broadcasts whether they are streaming live programming or previously aired programming.

Plans/procedures include a list of broadcast stations and other systems used to provide emergency instructions to people in the plume exposure pathway EPZ. An acceptable system has the capability to broadcast official information, 24 hours a day, 7 days a week and will remain unaffected by adverse environmental conditions (e.g., floods, power outage). The EAS must have the capability to repeat the EAS messages multiple times. Establishing a set of intervals ensures maximum coverage. Plans/procedures address the mechanism for advising the EAS station to discontinue messages that no longer apply.

For further information regarding ANS, please see Part V of this Manual.

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 1994.
- National Incident Management System, January 2019.
- National Response Framework, July 2014.

EVALUATION CRITERION E.3

The licensee and state, local, and tribal government organizations establish the contents of the initial and follow-up emergency notifications to be sent from the NPP.

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

TO MEET THE INTENT OF EVALUATION CRITERION E.3, ORO PLANS/PROCEDURES INCLUDE:

- i. Initial notification templates to capture the ECL, whether a release is taking place, any populations and areas that may potentially be affected, and whether protective measures may be necessary; and
- ii. Provisions as to what information is to be included in follow-up notifications from the NPP to offsite authorities.

EXPLANATION

Plans/procedures describe how the licensee and OROs determine the contents of initial and follow-up emergency notifications that are sent from the NPP to OROs.

The licensee and OROs may develop initial notification templates to capture key information that is needed from the NPP such as the ECL, whether a radiological release is taking place, potentially affected population and areas, and whether protective measures may be necessary.

Follow-up notifications are notifications that are distributed after an initial notification has been distributed. These notifications may contain updated information on the incident (e.g., a change to the ECL from the initial notification). Contents for follow-up notifications include the following information, if known and appropriate:

- Location of incident, and name and telephone number (or communication channel identification) of caller;
- Date/time of incident;
- ECL;
- Type of projected or actual release (airborne, waterborne, surface spill, etc.) and estimated duration/impact times;
- Estimate of quantity of radioactive material released or being released, and the points and height of releases;
- Chemical and physical form of released material, including estimates of the relative quantities and concentration of noble gases, iodine, and particulates;
- Meteorological conditions at appropriate levels (wind speed, during [to and from site], indicator of stability, precipitation, if applicable);
- Actual or projected dose rates at the site boundary and/or projected integrated dose at site boundary;
- Projected dose rates and integrated dose at the projected peak at 2-, 5-, and 10 miles, including any affected sector(s);
- Estimate of any surface radioactive contamination in the plant, onsite, or offsite;
- Any licensee emergency response actions underway;
- Recommended emergency actions, including protective measures;
- Request for any onsite support by offsite organizations; and
- Prognosis for worsening or termination of event based on plant information.

REFERENCES

- *Comprehensive Preparedness Guide 101: Developing and Maintaining Emergency Operations Plans*, Version 2.0, November 2010.
- *National Incident Management System*, January 2019.

EVALUATION CRITERION E.4

Each organization establishes the contents of the initial and follow-up messages to the public including, as applicable, instructions for protective actions.

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

TO MEET THE INTENT OF EVALUATION CRITERION E.4, ORO PLANS/PROCEDURES INCLUDE:

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

EXPLANATION

Within plans/procedures, all organizations responsible for public information messages establish contents of initial and follow-up messages to distribute to the public, including, as applicable, instructions for protective actions.

Initial messages. OROs are responsible for developing public information messages that are included in their plans/procedures. The EAS messages are modified as necessary and sent to the identified EAS station(s) for broadcast to the public. Plans/procedures discuss the process for modifying or selecting pre-scripted or computer-generated EAS messages. Plans/procedures discuss the process of transforming the protective action decisions (PADs) made by the responsible entities into a format that is understandable to the general public. At a minimum, contents of the message should include the following:

- Identification of the ORO and official with authority for providing the EAS alert signal and instructional message;
- Identification of the commercial NPP and a statement that indicates an emergency exists at the site;
- Reference to REP-specific emergency information (e.g., brochures, calendars) for use by the general public during an emergency; and
- A closing statement requesting the affected and potentially affected populations to stay tuned for additional information, or to tune into another station for further instructions and information (e.g., special news broadcast).

Follow-up messages. OROs develop message templates for special news broadcasts as follow-up messages to the EAS message. These follow-up messages are prepared and disseminated in a timely manner after the original EAS message is broadcast. If not clearly identified in the EAS message(s), these broadcasts must include the following information:

- Precautionary protective actions for persons with disabilities and access/functional needs (e.g., school children, transportation-dependent individuals), agriculture advisories, transportation restrictions (e.g., air, water, or rail), 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 area (e.g., area A uses route 1), including a description. The description includes a means a means for translating that PAD-covered area from the format used by OROs into a format that includes landmarks and boundaries;
- Methods to maximize protection when requested to shelter-in-place;
- Public inquiry telephone numbers or email address available to the public, as well as appropriate responses to rumors and inquiries;
- Ingestion-related instructions and information, when applicable; and
- Items or things evacuees should or should not take with them when evacuating (e.g., livestock, household pets).

Plans/procedures describe the method used to release follow-up messages, such as a press release read over the air, live interviews with ORO officials, or live recorded messages from the ORO's EOC(s).

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 subsequently counter, any rumors that may impact the public's willingness to follow any instructions issued by authorities.

Non-English language messages. At a minimum, EAS messages and any special news broadcasts should be translated into any non-English language spoken by either more than 10,000 individuals or more than 5% of the total voting age citizens in a single political subdivision (e.g., county, townships, municipality, etc.) within the EPZ. If required, plans/procedures address

the process for developing and broadcasting foreign language messages. OROs make arrangements to ensure that the content of foreign language messages is consistent with the messages in English. This may be accomplished by reviewing the written foreign language messages, having them translated to English, and compare against the original English messages. When foreign language messages are utilized, they are included in plans/procedures, or otherwise provided by the reviewer.

REFERENCES

- *Comprehensive Preparedness Guide 101: Developing and Maintaining Emergency Operations Plans*, Version 2.0, November 2010.
- 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 1999.
- Voting Rights Act of 1965, Pub. L. No. 89-110 (1965) (codified as amended at 42 U.S.C. § 1973 et seq.).

EVALUATION CRITERION E.5

Provisions are made to provide timely supplemental information periodically throughout the radiological incident to inform the public.

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

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

- i. A description of how supplemental information is provided periodically to inform the public throughout an incident;
- ii. A description of supplemental topics/messages that may be disseminated; and
- iii. A description of the method for disseminating supplemental information.

EXPLANATION

ORO should provide timely supplemental information periodically throughout a radiological incident to inform the public (criterion E.4 establishes the contents for messaging, including protective action instructions). Supplemental information may include providing a status update or reiterating critical information or instructions that have already been disseminated through initial and follow-up messages.

A description of the communication system(s) and method(s) for disseminating supplemental information (e.g., informational bullets/posts, broadcasts, social media, ANS) are also included in the plans/procedures. OROs develop special news broadcasts as supplemental information to the EAS message. These special news broadcasts are prepared and disseminated in a timely manner after the initial EAS message is broadcast. Plans/procedures describe the method and related processes used to release special news broadcasts of supplemental information.

REFERENCES

- *Comprehensive Preparedness Guide 101: Developing and Maintaining Emergency Operations Plans*, Version 2.0, November 2010.
- *National Incident Management System*, January 2019.
- *National Response Framework*, July 2014.

Planning Standard F – Emergency Communications

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

EVALUATION CRITERION F.1

Each principal response organization establishes redundant means of communication and addresses the following provisions:

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

EVALUATION CRITERION F.1.a

Continuous capability for notification to, and activation of, the emergency response network, including a minimum of two independent communication links.

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

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

- i. A description of the system used to ensure continuous availability to receive and transmit notifications; and
- ii. A description of the equipment used for notifying and communicating with the organization's personnel and other response organizations. The equipment described must include at least two independent communication links.

EXPLANATION

This evaluation criterion addresses the continuous capability of the identified communications systems in the emergency response network²¹ to receive and dispatch notifications to appropriate emergency response personnel within an ORO's organization and among other response organizations. Plans/procedures describe the equipment used for notifying and communicating with appropriate personnel and other response organizations. The equipment described includes at least two independent communication links (e.g., dedicated telephone line, specific radio net, etc.). This description also includes how the identified systems will continuously be able to receive and transmit notifications. For example, the system is generally a continuously staffed warning point (e.g., police dispatch center) and/or a duty officer system in which the designated duty officer carries a device for personal notification.

In addition to a description, OROs should consider including a diagram depicting the communication links.

REFERENCES

- FEMA Comprehensive Preparedness Guide 101, *Developing and Maintaining Emergency Operations Plans*, Version 2.0, November 2010.
- *National Incident Management System*, Third Edition, October 2017.

²¹ The emergency response network is the generic term used to refer to communications systems, including hardwired and wireless telephone networks, broadcast and cable television, radios, mobile radios, satellite systems, and increasingly, the Internet.

EVALUATION CRITERION F.1.b

Communication with applicable organizations to include a description of the methods that may be used when contacting each organization.

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

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

- i. Provisions for a minimum of two independent communication methods between all applicable organizations requiring communications within the plume and ingestion exposure pathway EPZs; and
- ii. Organizational titles and alternates for both ends of the communication links.

EXPLANATION

The intent of this evaluation criterion is for OROs to describe their methods of communicating with the all applicable organizations (e.g., field monitoring teams, private sector contractors, Federal agencies, etc.), and appropriate facilities as needed (e.g., EOF, EOCs, alternate EOCs, JIC). This description includes the following: (1) a list of applicable organizations, which includes both internal and external organizations, that comprise the overall response effort (i.e., at a minimum the Federal, state, local, and tribal government; licensee; and other private sector organizations identified in evaluation criteria A.1); (2) a minimum of two independent communication method(s), at least one of which is independent of the switched commercial telephone system (e.g., ordinary [switched] commercial telephone, dedicated telephone line, county Law Enforcement Radio Net [LERN], National Warning System [NAWAS], cellular) for each identified organization; and (3) the processes/protocols of how communication will occur amongst and between the identified organizations.

If applicable, plans/procedures delineate if partial or all communications with Federal response organizations will be relayed through another organization (e.g., local and tribal communications with Federal response organizations may be through the state).

For HAB incidents, the response to a hostile action at an NPP may need expansion of the traditional REP communication capabilities and procedures, and involve non-traditional REP entities (e.g., FBI). Therefore, the following capabilities are considered: (1) the need for interoperable, redundant, and reliable communication with the licensee, the EOC, incident command and non-traditional REP entities and locations (e.g., FBI, FEMA, and HHS); (2) the need for two independent communication links to support the exchange of sensitive information; and (3) the need for procedures for the sharing of sensitive information among Federal, state, local, and tribal agencies and the licensee.

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

For each identified communication method, both ends of the communication link identify an alternate point of contact for all applicable organizations. Alternates and their organizational title are described in plans/procedures.

REFERENCES

- FEMA Comprehensive Preparedness Guide 101, *Developing and Maintaining Emergency Operations Plans*, Version 2.0, November 2010.
- National Incident Management System, Third Edition, October 2017.

EVALUATION CRITERION F.1.c

Systems for alerting or activating emergency personnel in each response organization.

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

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

- i. A general description of how emergency personnel are alerted and activated; and
- ii. Lists of names and contact information of emergency personnel to alert or activate based on the ECL.

EXPLANATION

For each ECL, plans/procedures describe the alert and activation process (i.e., notified of an incident and requested to report to their emergency duty station) of applicable emergency personnel, including establishing a list of names and their contact information of personnel. Typically, an assigned individual at a warning point (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, or otherwise activate the response organization through an automated system.

Lists of response staff and contact information may be withheld from the plans/procedures and replaced with a reference indicating where this information may be obtained (e.g., EOC, county building, or dispatch center).

REFERENCES

- FEMA Comprehensive Preparedness Guide 101, *Developing and Maintaining Emergency Operations Plans*, Version 2.0, November 2010.
- *National Incident Management System*, Third Edition, October 2017.

EVALUATION CRITERION F.2

Systems for coordinated communication methods for applicable fixed and mobile medical support facilities are described.

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

TO MEET THE INTENT OF EVALUATION CRITERION F.2, ORO PLANS/PROCEDURES INCLUDE:

- i. A description of at least two independent communication methods among the fixed and mobile medical support facilities, applicable EOCs, and the licensee.

EXPLANATION

The intent of this evaluation criterion is to ensure effective means of communication have been established among the licensee, applicable EOCs, and the identified fixed and mobile medical support facilities. Mobile medical facilities include aid camps, triage stations, and other temporary medical care locations used for response.

Plans/procedures describe the communication methods between the fixed and mobile medical support facilities identified in evaluation criterion L.1 (i.e., for all primary and backup hospitals/medical facilities and ambulances with a role in the transportation and treatment of contaminated, injured individuals).

The transport crew is able to communicate directly with the receiving fixed and mobile medical support facilities 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. For additional information on transporting radiologically contaminated, injured individuals see evaluation criterion L.4.

REFERENCES

- FEMA Comprehensive Preparedness Guide 101, *Developing and Maintaining Emergency Operations Plans*, Version 2.0, November 2010.
- The Joint Commission: Hospital, Emergency Management Chapter, Standard EM.02.02.05, July 2012.

EVALUATION CRITERION F.3

The testing method and periodicity for each communication system used for the functions identified in evaluation criteria E.2, F.1, and F.2 are described.

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

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

- i. A description of the test method and periodicity (e.g., monthly, quarterly or annually) for each communication system used for the functions identified in evaluation criteria E.2, F.1, and F.2.

EXPLANATION

Communication system testing validates if the system hardware operates properly and capable to perform the functions identified in evaluation criteria E.2, F.1, and F.2. Periodic testing is conducted to ensure that communications systems are available when needed. Plans/procedures indicate that:

- ORO communications systems are tested monthly;
- Communications with the Federal response organizations and states within the ingestion exposure pathway EPZ are tested quarterly;
- Communications with the NPP, ORO EOCs, and field assessment teams are tested annually; and
- All communications drills include a message content check.

Periodic testing is described for systems that are less frequently used or limited to emergency use, such as dedicated telephone circuits, emergency-only radio channels, devices used for personnel notification, etc. Testing includes any associated electronic or computer equipment (e.g., fax machines, auto-dial equipment, or computers used to store phone numbers). Communication 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. Plans/procedures describe the testing method and periodicity (e.g., monthly, quarterly, or annually) of how and when communication systems are to be tested.

REFERENCES

- FEMA Comprehensive Preparedness Guide 101, *Developing and Maintaining Emergency Operations Plans*, Version 2.0, November 2010.
- National Incident Management System, Third Edition, October 2017.

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.

EVALUATION CRITERION G.1

Provisions are made for a coordinated annual dissemination of information to the public within the plume exposure pathway EPZ, including transient populations and those with access and functional needs, regarding how they will be notified and what actions should be taken. The information is disseminated using multiple methods, to include non-English translations per current Federal guidance.

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

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

- i. A description of public information material(s) (e.g., brochure, utility bill insert, current technology used for disseminating public information) distributed annually to the general public within the plume exposure pathway EPZ, including the dissemination method(s) used to reach all residences;
- ii. Provisions for identifying individuals who need evacuation assistance and how personally identifiable information (PII) will be protected;
- iii. A description of public information material(s) (e.g., visitor brochure) targeted to transient populations, including dissemination method(s);
- iv. Provisions for providing accessible public information for those with access and functional needs within the plume exposure pathway EPZ; and
- v. Mechanisms for translating public information for non-English speaking populations within plume exposure pathway EPZ.

EXPLANATION

This evaluation criterion addresses the contents, format, and dissemination methods of annually distributed public information to all residents within the plume exposure pathway EPZ, including to individuals with access and functional needs and transient populations. Public information materials may take various forms, including brochures (for both residents and visitors), utility bill inserts, or calendars; all of these materials may be distributed in hardcopy and/or through electronic means (e.g., text message, email, websites, etc.). Considerations for disseminating information in accessible formats for individuals with access and functional needs,²² including providing translated information for non-English speaking populations, are described. When using electronic formats, consideration should be given to distributing to those who may not have readily available access to current technology (i.e., computers, cellular telephones).

Public information materials are consistent with plans/procedures and any information/pre-scripted material used to make PADs and compose messages (e.g., pre-scripted material for the EAS, tone alert radio broadcasts, social media platforms, or WEA system).

²² The National Response Framework (June 2016) defines access and functional needs refers to persons who may have additional needs before, during, and after an incident in functional areas, including but not limited to: maintaining health, independence, communication, transportation, support services, self-determination, and medical care. Individuals in need of additional response assistance may include those who have access and functional needs; live in institutionalized settings; are older adults; are children; are from diverse cultures; have limited English proficiency or are non-English speaking; or are transportation disadvantaged.

Copies of public information materials must be provided to the FEMA on an annual basis through the ALC. In addition to the ALC submission, revised annual public information materials are sent to FEMA prior to dissemination for review. For additional information, see Part IV, Section N.

a. Information for the General Public

Generally, the licensee and OROs coordinate and communicate on the content and distribution arrangements of information disseminated to the general public in the plume exposure pathway EPZ. Plans/procedures describe the methods used to disseminate public information, assuring that all residences in the plume exposure pathway EPZ are reached. Information is consistent with emergency response plans/procedures, and written clearly and concisely, in “plain language,” for easy comprehension among the general public. Information may include the following:

- A clear statement of purpose for receiving the information;
- Date (year) of issue and issuing agency(ies);
- A statement instructing recipients to maintain the information for future use;
- A statement emphasizing that recipients should monitor information channels for updates;
- A point of contact for additional and/or follow-up information;
- Basic information on radiation, including how the NPP produces electricity, the ECLs, etc.;
- Detailed information on how the public located in the plume exposure pathway EPZ will be notified and where to obtain emergency information and instructions for protective actions. 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;²³
- Information on protective actions for those located both in- and outside their residence (e.g., in a vehicle, at work, out shopping or dining) when a protective action is ordered, including:
 - Instructions/actions on sheltering-in-place (e.g., close doors and windows, turn off air conditioning or heating, monitor for additional information);
 - Instructions/actions on preparing for an evacuation, if/when directed (e.g., secure the home, pack essential evacuation supplies, check with neighbors to carpool or see if they need a ride, report to identified evacuation destination(s) [e.g., reception or relocation center], monitor for additional information or protective action instructions [e.g., respiratory protection advisements], information on transportation assistance);
 - Instructions/actions on distributing and administering radioprotective drugs to the general public (e.g., KI), or if state and/or tribal governments have authorized the use of radioprotective drugs for the general public. In some cases, state and/or tribal governments within a plume exposure pathway EPZ may have different policies and procedures for public distribution and use of radioprotective drugs. In such cases, public information materials address these varying policies and procedures and clearly delineate the differences among the plume and/or ingestion exposure pathway EPZ jurisdictions;

²³ As a condition of licensing, all radio and television stations were mandated by the 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: 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.

- An easy-to-read plume exposure pathway EPZ map clearly highlighting evacuation routes, reception center locations, and centers used for public services during an emergency (e.g., places for parents to pick up their children, facilities designated to provide monitoring and decontamination of household pets). The map includes a simple legend, written directions, physical addresses, and a compass;
- Provisions for individuals with access and functional needs, within the plume exposure pathway, including a method for individuals in need of evacuation assistance to contact authorities and identify their or another's need for assistance during an evacuation;²⁴
- Information for individuals with access and functional needs, which may include information pertaining to the care of school children (public and private), those with access and functional needs, older adults, and/or transportation disadvantaged;
- Information on centers used for public services during an emergency, congregate care, and the services and supplies provided by those centers (e.g., information of facilities accepting household pets);
- Policies and provisions for service animals and pets; and
- Agricultural information, if appropriate to the area, including information or instructions regarding protection of livestock and commercial agricultural or home garden/livestock products. This may include references to additional sources of information.

b. Identification of Individuals Needing Assistance during an Evacuation

Plans/procedures describe a method(s) for identifying individuals needing assistance when evacuating. Such individuals may include those with access and functional needs, older adults, and transportation-dependent. Methods for identifying these individuals needing assistance may include: (1) coordinating with other agencies to gather a comprehensive list of such individuals, (2) a registration form in the annually distributed public information materials for individuals to complete and return to the appropriate agency, and (3) providing a method in the annually distributed public information materials for individuals to contact authorities and identify their need or another's need (e.g., an elderly family member living alone) for assistance during an evacuation. The method or combination of methods are comprehensive enough to generate a complete list of individuals who will need evacuation assistance.

c. Information for Transient Populations

The licensee and OROs may develop condensed versions of public information directed at transient populations (e.g., signs, decals, notices, visitor brochures, etc.), separate from information distributed to the general public. These condensed versions 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, social media outlet, or telephone book page.

Distribution of informational materials directed at transient populations are located in places likely to be frequented by transients, such as gas stations, motels/hotels, parks and recreation areas, marinas, shopping malls, major employers, etc. Plans/procedures include a list of the locations where such materials are posted, as well as a mechanism for annual updates.

New signs are not required to be posted every year, provided none of the displayed information has changed. However, plans/procedures specify an annual procedure for: (1) determining whether any of the notices need to be updated, and (2) if so, replacing old materials with the new materials. In addition, OROs annually audit locations where information is posted to determine if information is still visible and legible, or whether information needs to be replaced or moved for better visibility.

²⁴ The Americans with Disabilities Act of 1990 (ADA), the Rehabilitation Act of 1973 (RA), and the Fair Housing Act of 1968 (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.

d. Accessibility and Foreign Language Translation of Public Information Materials

Plans/procedures include provisions for creating accessible 508 compliant materials²⁵ (e.g., materials meet minimal font size specifications, contain good color contrast between font and background, electronic materials are able to be interpreted by a screen reader, etc.) to reach those with access and functional needs within the plume exposure pathway EPZ. When translating, care should be given not to translate the official name of the ECL(s); the proper names of the four classification levels should be used. In general, proper names should be left in the source language with a translation explanation of the name in square brackets right after it. It is acceptable to translate the meaning of the ECL, but not the actual ECL. The ECL's proper names should remain in English through all translated documents (i.e., news releases, special news bulletins, and EAS messages), with the definitions of the ECLs being the focus of the translation.

Plans/procedures include provisions for providing public information to non-English speaking populations within the plume exposure pathway EPZ. At a minimum, public information materials are translated into any non-English language spoken by more than 10,000 individuals or more than 5% of the total voting age population in a single political subdivision (usually a county, but a township or municipality in some States) within the plume exposure pathway EPZ.²⁶ All translated information is clear, accurate, consistent, and complete.

As appropriate, contacts and service contracts are established to develop accessible and/or translated information materials for dissemination to the public prior to and during an incident. It is recommended for OROs to identify local media and/or community organizations (e.g., specialized newspapers, radio or TV stations, and Voluntary Organizations Active in Disaster [VOAD]) to help reach individuals with access and functional needs and non-English speaking populations, as well as targeting these populations during awareness/preparedness campaigns.

If translations of public information materials are not provided for a non-English speaking language within the plume exposure pathway EPZ, FEMA recommends OROs make other efforts to provide that population similar information provided to other populations in the plume exposure pathway EPZ. Such efforts may 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(s);
- 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 and help further support the purpose of the public information program, ensuring populations within the plume exposure pathway EPZ are educated in what to expect and how to respond to a radiological incident.

e. Information for the Ingestion Exposure Pathway EPZ

The licensee and/or OROs are prepared to disseminate information for implementing protective actions for the entire ingestion exposure pathway EPZ should the ECL reach a SAE or GE. Plans/procedures describe the methods for annual distribution of ingestion exposure pathway EPZ information within the plume exposure pathway EPZ, and when applicable, within the ingestion exposure pathway EPZ. Copies of public information materials must be provided to the FEMA on an annual basis through the ALC. In addition to the ALC submission, revised annual public information materials are sent to FEMA prior to dissemination for review. For additional information, see Part IV, Section N.

Information for the ingestion exposure pathway covers the following subjects:

²⁵ For guidance on creating 508 compliant materials, visit <https://www.section508.gov/>.

²⁶ See Part IV, Section O. Public Information Guide and Process.

- Effects of radiation and radioactive material deposits on the human food supply;
- Explanation of ORO ingestion PAGs;
- How farmers, human food processors, and distributors will be notified of when and which protective actions are taken in an emergency;
- Those with personal gardens, farm-stands, or hobby farms (e.g., backyard poultry) will be notified of when and which protective actions are taken in an emergency;
- Identification of sources of where to obtain further emergency information during an emergency, such as National Oceanic and Atmospheric Administration (NOAA) Weather Radio and the EAS; and
- Identification of possible preventive protective actions taken for foodstuffs and water, including livestock, poultry, fruits, vegetables, and other crops. Examples of preventive protective actions include:
 - Milk – Removing all lactating dairy animals from pasture and placing them on uncontaminated feed and water;
 - Vegetables and Fruits – Washing, brushing, and 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 scenario, 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 transfer little or no radioactive material to the human diet could be substituted for other human 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;
 - 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; and
 - Other emergency protective actions which may involve the interdiction or condemnation of foodstuffs, feeds or other contaminated products.

REFERENCES

- EPA-400/R-17/001, *PAG Manual: Protective Action Guides and Planning Guidance for Radiological Incidents*, January 2017.
- EPA-402/K-17/002, *Protective Action Questions & Answers for Radiological and Nuclear Emergencies: A companion document to the U.S. Environmental Protection Agency Protective Action Guide (PAG) Manual*, September 2017.
- Executive Order 13407.

- FEMA/Federal Radiological Preparedness Coordinating Committee, *Communicating During and After a Nuclear Power Plant Incident*, June 2013.
- *National Incident Management System*, Third Edition, October 2017.
- *National Response Framework, Emergency Support Function #15 – External Affairs Annex*, June 2016.
- *National Response Framework, Public Affairs Support Annex*, May 2013.

EVALUATION CRITERION G.2

Methods, consistent with JIS concepts, are established for coordinating and disseminating information to the public and media. Plans include the physical location(s) for interacting with the media.

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

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

- i. The physical location(s) for briefing and interacting with the media;
- ii. A physical description of the media briefing facility(ies);
- iii. A description of the organization's capability to answer media telephone inquiries; and
- iv. The mechanism for coordination between the team of personnel designated to answer media calls and the organization's spokesperson(s)/Public Information Officer(s) (PIO(s)), as well as POCs located at other facilities supporting the joint information center (JIC).

EXPLANATION

During a radiological incident, large numbers of media representatives are expected to congregate in the area of the incident, seeking information about the incident and response efforts. A joint information system (JIS) is a structured approach to organizing, integrating, and delivering information that ensures timely, accurate, accessible, and consistent messages can be delivered across multiple jurisdictions and/or disciplines to the media, nongovernmental organizations (NGOs), and the private sector. Critical supporting elements of the JIS include the plans, protocols, procedures, and structures used to provide public information.

a. Physical Location and Facility Description

To promote organized release of information, suitable locations for briefing the media are designated in advance, whether at a JIC, a separate facility, or both. In most instances, the licensee and involved governmental jurisdictions have designated a single facility for joint use; however, media contact 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 evaluation criterion addresses the physical requirements of a media facility for all jurisdictions that operate a media facility, whether joint or separate.

Plans/procedures include a physical description of the facility, including location, size, and the steps necessary to get the facility operational (e.g., coordination with other organizations, installation of equipment, and rearranging of furnishings). If the primary facility is located within the plume exposure pathway EPZ, then an alternate facility is identified and available with similar capabilities, and described with the same level of detail specified for the primary facility.

The facility description includes a statement indicating at what point in time the media facility will be activated and the individual, by title/position, responsible for staffing and operating the 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 operating the JIC, and method for contacting that organization. Identification and detailed description of an alternate facility located outside the plume exposure EPZ and equipped with the same capabilities as the primary facility, if the primary facility is within the plume exposure pathway EPZ.

b. Public Inquiries

In addition to face-to-face interactions, each principal organization is capable to respond to media inquiries. To effectively manage telephone inquiries on a large-scale, a multi-line phone setup, and a designated team of trained personnel are established to handle media calls. If an internet-based system is used to complement this capability, plans/procedures include a description of the system's capabilities and how the system will be appropriately monitored and staffed.

At a minimum, plans/procedures specify a telephone number that is strictly designated for incoming media inquiries (separate from a number given out to the general public) and a team of trained personnel, by title/position, designated to answer and respond to media inquiries. Plans/procedures describe the mechanism(s) for coordinating between the team of personnel answering media inquiries, the organization's spokesperson(s)/PIO(s), and POCs located at other facilities supporting the JIC.

c. Recommended Features for a Joint Information Center (JIC)/Media Facility

Certain features are recommended for supporting JIC and media center operations. Even for jurisdictions with limited resources and performing small-scale media functions at their own facilities (e.g., towns, small municipalities, EOC), FEMA recommends incorporating, to the extent possible, the following recommended features for a JIC/media facility:

- A briefing room to accommodate members of the media;
- Private (i.e., media-free) work areas for public information personnel;
- Effective communications systems for the spokesperson(s)/PIO(s) to maintain contact with EOCs and all other relevant response locations;
- Sufficient equipment to support operations;
- 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;
- Internet connectivity;
- Provisions to control access to the facility (e.g., security personnel, a sign-in desk, identification badges);
- A work area for the public inquiry team;
- A work area for the media inquiry team; and
- A media monitoring area.

REFERENCES

- FEMA Comprehensive Preparedness Guide 101, *Developing and Maintaining Emergency Operations Plans*, Version 2.0, November 2010.
- FEMA/Federal Radiological Preparedness Coordinating Committee, *Communicating During and After a Nuclear Power Plant Incident*, June 2013.
- *National Incident Management System*, Third Edition, October 2017.
- *National Response Framework, Emergency Support Function #15 – External Affairs Annex*, June 2016.
- *National Response Framework, Public Affairs Support Annex*, May 2013.

- National Response Team, *National Response Team (NRT) Joint Information Center Model – Collaborative Communications during Emergency Response*, April 2013.
- NUREG/CR-7033, *Guidance on Developing Effective Radiological Risk Communication Messages: Effective Message Mapping and Risk Communication with the Public in Nuclear Plant Emergency Planning Zones*, February 2011.

EVALUATION CRITERION G.3

Organizations designate news media points of contact and a spokesperson(s) with access to necessary information.

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

TO MEET THE INTENT OF EVALUATION CRITERION G.3, ORO PLANS/PROCEDURES INCLUDE:

- i. Identification of the individual(s), by title/position, to serve as news media point(s) of contact and spokesperson(s)/PIO(s) at designated media briefing location(s);
- ii. If operating remotely from the EOC, a description of how the exchange of information between the EOC and other media briefing location(s) will be coordinated;
- iii. The process for identified individual(s) to obtain, verify, and coordinate approval in advance of disseminating information to the public and/or media; and
- iv. Procedures for control and authorization of releasing sensitive information.

EXPLANATION

To establish effective news media interaction, plans/procedures identify individuals to serve as news media POCs and spokesperson(s) to interact with the media. Designated licensee, state, local, and/or tribal individuals to serve as primary news media POCs for the media to contact with their inquiries. A spokesperson (e.g., PIO, media director/coordinator, public affairs officer) participates and/or leads regular news briefings and conferences on behalf of an agency (state, county, municipality, company, or group), and are fully prepared with current information and incident facts, incident messages, and incident management roles and responsibilities. Spokespersons may include incident management leadership and public affairs professionals.

a. Spokesperson/PIO Role and Responsibilities

A spokesperson(s)/PIO(s) is trained in interacting with the media to avoid overburdening key response officials and controlling access to the latest official information concerning the emergency and response efforts.

If media interaction is planned for more than one location, a spokesperson(s) is assigned to each location. To effectively perform the role, a spokesperson/PIO has direct access to the latest official information concerning the emergency and their agency's response efforts. If a spokesperson/PIO is unable to be or function at the EOC, or at other media briefing location(s), plans/procedures identify a mechanism for forwarding key information to the PIO/spokesperson and allowing that person to approach response officials for answers to specific questions in advance of releasing any information to the public and/or media.

b. Information Control and Release Procedures

ORO procedures establish formal control mechanisms to maintain consistency and reliability of information before being released to the public or media, such as using preapproved generic press statements, and requiring information be consistent and obtaining approval by an authorized individual(s). Furthermore, plans/procedures include the process for an identified individual(s) to obtain, verify, and coordinate approval in advance of disseminating any information to the public or media in a timely manner.

ORO plans/procedures include comprehensive controls and procedures for the control and authorization of releasing sensitive information (e.g., information about injuries, private information about persons with access and functional needs, sensitive law-enforcement information). 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). Use of 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.

c. Considerations for HAB Incidents

In a 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, law enforcement, and additional components of the DHS. The presence of these agencies will require additional coordination and may call for different procedures regarding the sharing and dissemination of public information. The 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 investigation 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 a HAB incident. Roles and responsibilities for release of public information in a HAB incident are defined in ORO plans/procedures (particularly between the FBI and response organizations, including the Incident Command). Guidelines need to determine what is withheld for security reasons and what information is released to protect the public.

REFERENCES

- FEMA Comprehensive Preparedness Guide 101, *Developing and Maintaining Emergency Operations Plans*, Version 2.0, November 2010.
- FEMA/Federal Radiological Preparedness Coordinating Committee, *Communicating During and After a Nuclear Power Plant Incident*, June 2013.
- National Incident Management System, Third Edition, October 2017.
- National Response Framework, *Emergency Support Function #15 – External Affairs Annex*, June 2016.
- National Response Framework, *Public Affairs Support Annex*, May 2013.
- NUREG/CR-7033, *Guidance on Developing Effective Radiological Risk Communication Messages: Effective Message Mapping and Risk Communication with the Public in Nuclear Plant Emergency Planning Zones*, February 2011.

EVALUATION CRITERION G.3.a

Arrangements are made for the timely exchange of information among the designated spokespersons representing the entities involved in incident response.

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

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

- i. Provisions for the timely exchange, discussion, and coordination of information among all designated spokespersons/PIOs, including those at different locations.

EXPLANATION

Utilizing JIS is an effective tool to achieve public information goals and facilitate timely exchange, discussion, and coordination of information among all designated spokesperson(s)/PIO(s). Coordination and communication among all

designated spokesperson(s)/PIO(s) of different organizations and levels of government ensures information disseminated to the public is accurate, consistent, timely, and easy to understand. Provisions for the timely exchange, discussion, and coordination of information among all designated spokesperson(s)/PIO(s) are described in the plans/procedures, which may include verbal (e.g., face-to-face, teleconference, video chat, etc.), electronic (e.g., email), and/or print communications (e.g., hard copies of press releases or other informational materials).

If an organization has a spokesperson(s)/PIO(s) at a separate facility, in addition to or instead of the JIC, equipment and procedures for timely exchange of information with other spokespersons/PIOs are available and included.

REFERENCES

- EPA-402-F-07-008, *Communicating Radiation Risks, Crisis Communications for Emergency Responders*, September 2007.
- FEMA-517, *Basic Guidance for Public Information Officers (PIOs)*, November 2007.
- FEMA Comprehensive Preparedness Guide 101, *Developing and Maintaining Emergency Operations Plans, Version 2.0*, November 2010.
- FEMA/Federal Radiological Preparedness Coordinating Committee, *Communicating During and After a Nuclear Power Plant Incident*, June 2013.
- *National Incident Management System, Third Edition*, October 2017.
- *National Response Framework, Emergency Support Function #15 – External Affairs Annex*, June 2016.
- *National Response Framework, Public Affairs Support Annex*, May 2013.
- National Response Team, *National Response Team (NRT) Joint Information Center Model – Collaborative Communications during Emergency Response*, April 2013.
- NUREG/CR-7033, *Guidance on Developing Effective Radiological Risk Communication Messages: Effective Message Mapping and Risk Communication with the Public in Nuclear Plant Emergency Planning Zones*, February 2011.

EVALUATION CRITERION G.4

Organizations establish coordinated arrangements for identifying and addressing public inquiries and inaccurate information.

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

TO MEET THE INTENT OF EVALUATION CRITERION G.4, ORO PLANS/PROCEDURES INCLUDE:

- i. A description of the capability to effectively receive and manage numerous, simultaneous responses to public inquiries, and address inaccurate information;
- ii. The method(s) for publicizing all the available communication channels, including dedicated telephone number(s) and other platforms, for public inquiries;
- iii. Provisions for monitoring public inquiries and media messaging to identify incomplete, inaccurate, or ambiguous information related to the emergency in the public domain; and
- iv. If an ORO sends a delegate or relies on another organization to answer public inquiries, identify which organization provides or coordinates the public inquiries and the method for contacting that organization.

EXPLANATION

Establishing an effective public inquiry program provides a central, official source for the public to access and obtain answers to questions during a response effort. It also helps response officials identify 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.

At many locations, public inquiry is conducted as a joint operation, often co-located with the JIC. Public inquiry may be done by one principal organization on behalf of appropriate OROs.

a. Capability and Activation of Public Inquiries Center/Hotline

Plans/procedures of organizations responsible for the function of public inquiry include a statement indicating at what point in time the public inquiries center/hotline will be activated and who, by title/position, will be responsible for staffing and operation. Telephones and trained 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 trained personnel, identified by title/position, may be used to complement this capability.

b. Media Monitoring

A media monitoring function supplements the public inquiry program to identify incomplete, inaccurate, or vague information related to the incident being disseminated in the public domain.

The scope of media monitoring includes, as appropriate, print, radio, television, cable, and internet-based media.

c. 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. Based on inquiries received, staff is on alert for patterns or trends that may suggest the presence of unconfirmed accounts, rumors, misinformation, or confusion, and reports such patterns or trends to the spokesperson(s)/PIO(s) for clarification.

Plans/procedures also describe the method the spokesperson(s)/PIO(s) 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 spokespersons/PIOs, as appropriate, prior to the release of clarified and/or corrected information to the public and the media. The spokesperson(s)/PIO(s) promptly addresses such issues, as appropriate, in subsequent press releases and/or press briefings.

Finally, 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.

REFERENCES

- EPA-402-F-07-008, *Communicating Radiation Risks, Crisis Communications for Emergency Responders*, September 2007.
- FEMA Comprehensive Preparedness Guide 101, *Developing and Maintaining Emergency Operations Plans, Version 2.0*, November 2010.
- FEMA/Federal Radiological Preparedness Coordinating Committee, *Communicating During and After a Nuclear Power Plant Incident*, June 2013.
- *National Incident Management System, Third Edition*, October 2017.
- *National Response Framework, Emergency Support Function #15 – External Affairs Annex*, June 2016.
- *National Response Framework, Public Affairs Support Annex*, May 2013.
- NUREG/CR-7033, *Guidance on Developing Effective Radiological Risk Communication Messages: Effective Message Mapping and Risk Communication with the Public in Nuclear Plant Emergency Planning Zones*, February 2011.

EVALUATION CRITERION G.5

Organizations conduct programs to acquaint news media with the emergency plans at least annually.

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

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

- i. Provisions for an annual media briefing or other information exchange means to acquaint news media with emergency plans, the media's role during an incident response, and other radiological incident response topics;
- ii. A description of each informational item provided in the media kits; and
- iii. Means of distributing media kits.

EXPLANATION

OROs have a role as conduits of information to new media to promote accurate, objective reporting during radiological incidents. Informational items could include state or local fact sheets, public information brochures for local residents and/or transients, plume exposure pathway EPZ maps, ingestion pathway EPZ information, etc.

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

- An overview of the JIS and emergency plans/procedures, to include organizational roles and authorities, ECLs, and protective actions;
- POCs 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; and
- General information concerning radiation exposure and health effects, as well as the distribution and use of KI by the general public, as appropriate.

As described under evaluation 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 plume exposure pathway EPZ. However, in some cases, state and/or tribal governments within a plume exposure pathway 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 plume exposure pathway EPZ as part of their outreach and awareness efforts addresses all policies for the distribution and use of KI, noting the differences between such policies and procedures across jurisdictions.

OROs provide copies of materials used for media briefing to FEMA for review, as well as the date the media briefing was held, on an annual basis through the ALC. In addition to the ALC submission, materials may be reviewed during a staff assistance visit (SAV), exercise, separate mailing, etc. To avoid public confusion, it is essential that the information provided to the local media be consistent with the information contained in plans/procedures used to make PADs and compose messages (e.g., pre-scripted material for the EAS, tone alert radio broadcasts, social media platforms, or WEA system).

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, Third Edition, October 2017.
- National Response Framework, Emergency Support Function #15 – External Affairs Annex, June 2016.
- National Response Framework, Public Affairs Support Annex, May 2013.

Planning Standard H – Emergency Facilities and Equipment

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

EVALUATION CRITERION H.1

A TSC is established, using current Federal guidance, from which NPP conditions are evaluated and mitigative actions are developed.

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

EVALUATION CRITERION H.2

An OSC is established, using current Federal guidance, from which repair team activities are planned and teams are dispatched to implement actions.

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

EVALUATION CRITERION H.3

An EOF is established, using current Federal guidance, as the primary base of emergency operations for the licensee during a radiological incident. The EOF facilitates the management and coordination of the overall emergency response, including the sharing of information with Federal, state, local, and tribal government authorities.

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

EVALUATION CRITERION H.3.a

For an EOF that is located more than 25 miles away from the NPP site, provisions are made for locating NRC and offsite responders closer to the NPP site.

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

EVALUATION CRITERION H.4

An alternative facility (or facilities) is established, using currently provided and/or endorsed guidance, which would be accessible even if the NPP site is under threat of or experiencing hostile action.

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

EVALUATION CRITERION H.5

A JIC is established, and its location is identified, to coordinate communication from Federal, state, local, and tribal government authorities and licensee personnel with the public and media.

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

EVALUATION CRITERION H.6

Each organization establishes an emergency operations center (EOC) for use in directing and controlling response functions, and provides for timely EOC activation. For an EOC located within the plume exposure pathway EPZ, an alternate EOC, or location outside the plume exposure pathway EPZ, is identified to continue response functions in the event of an evacuation.

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

TO MEET THE INTENT OF EVALUATION CRITERION H.6, ORO PLANS/PROCEDURES INCLUDE:

- i. A description of, or reference to, the location and layout of the EOC;
- ii. The organization and official, by title/position, responsible for maintaining the operational readiness of the EOC;
- iii. A list of facility equipment necessary to support EOC operations;
- iv. Access control details into the facility;
- v. Backup power capability to the facility, if available; and
- vi. A description of, or reference to, the location and layout of the alternate EOC, if applicable.

EXPLANATION

Plans/procedures include or reference the location and layout of the EOC for directing and controlling emergency response functions, facility equipment (e.g., telephones, displays, fax machines, computers), and source(s) of backup power, if available. To ensure timely EOC activation and readiness, plans/procedures identify the organization and official, by title/position, responsible for maintaining operational readiness of the EOC.

Plans/procedures indicate access to the EOC is limited to individuals with functional responsibilities to support EOC operations and describe the access controls for preventing unauthorized personnel from gaining entry.

For EOC locations situated within the plume exposure pathway EPZ, plans/procedures identify an alternate EOC, or location outside the plume exposure pathway EPZ to continue response functions in the event of an evacuation. In case of a power failure, plans/procedures identify provisions to continue response functions, which may include alternate power sources, alternate locations, the use of a mobile command vehicle, etc.

If there is an alternate EOC, plans/procedures include the location and layout, and facility equipment (see evaluation criterion F.1.b for additional information on alternate EOC communication links).

REFERENCES

- FEMA Comprehensive Preparedness Guide 101, *Developing and Maintaining Emergency Operations Plans*, Version 2.0, November 2010.
- National Incident Management System, Third Edition, October 2017.
- National Response Framework, Third Edition, June 2016.
- Nuclear/Radiological Incident Annex to the Response and Recovery Federal Interagency Operational Plans, October 2016.

EVALUATION CRITERION H.7

Onsite monitoring systems used to initiate emergency response measures in accordance with the emergency classification scheme, as well as those to be used for conducting assessment, are identified. Monitoring systems consist of geophysical phenomena monitors, including meteorological, hydrologic, and seismic instrumentation; radiation monitors and sampling equipment; plant process monitors; and fire, toxic gas, and combustion products detectors.

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

EVALUATION CRITERION H.8

Provisions are made to acquire data from offsite monitoring and analysis equipment, including data on geophysical phenomena (e.g., meteorological, hydrologic, and seismic monitors) and radiological data (e.g., from FMTs, environmental dosimeters, and laboratory analyses).

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

EVALUATION CRITERION H.9

Organizations directly responsible for offsite radiological monitoring provide for radiological monitoring equipment. This includes equipment that is located or stored near the NPP site, as well as additional equipment that may be brought to the site.

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

TO MEET THE INTENT OF EVALUATION CRITERION H.9, ORO PLANS/PROCEDURES INCLUDE:

- i. A description of radiological monitoring equipment, by type and amount, that is located at or stored near the NPP, or will be brought in by the ORO; and
- ii. A list of fixed radiological monitoring stations near the NPP.

EXPLANATION

Plans/procedures identify offsite radiological monitoring equipment located at or stored near the NPP (e.g., at staging areas, ICPs, the EOF) and monitoring equipment OROs may bring to the NPP site. Plans/procedures include written descriptions of the types and quantities of equipment available at each location, including potential resources at fixed radiological monitoring stations located near the NPP site. Radiation detectors, permanent record dosimeters (PRDs) for the environmental monitoring program, and/or air sampling pumps from fixed radiological monitoring stations are identified in plans/procedures as potential resources. Maps of the fixed stations are included in plans/procedures.

REFERENCES

- National Incident Management System, Third Edition, October 2017.
 - Nuclear/Radiological Incident Annex to the Response and Recovery Federal Interagency Operational Plans, October 2016.
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EVALUATION CRITERION H.10

Instrumentation is provided to obtain current meteorological information. Additional provisions are made to obtain representative meteorological information from other sources as needed by the NPP's radiological assessment models for site-specific characterization of plume dispersion and transport. Meteorological information is provided to the control room, TSC, EOF (or backup EOF), and NRC (via ERDS).

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

EVALUATION CRITERION H.11

Provisions are made to ensure that emergency equipment and supplies are tested, maintained, and available in sufficient quantities, to include reserves and replacements, when needed. This includes:

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

TO MEET THE INTENT OF EVALUATION CRITERION H.11, ORO PLANS/PROCEDURES INCLUDE:

- i. Quantities of instruments, equipment, and supplies necessary to ensure that procedures in the plan can be performed; and
- ii. Backup emergency equipment and supply reserves/replacements.

EXPLANATION

Plans/procedures include provisions to ensure sufficient quantities of equipment for all emergency workers responding to an NPP incident. The plans/procedures discuss the following equipment types, as appropriate to their organization's operational role in an incident.

a. Dosimetry

Dosimeters are available in two basic types: PRDs (e.g., thermoluminescent dosimeters [TLDs] and optically stimulated luminescence dosimeters [OSLDs], which have to be read by a laboratory) and direct-reading dosimeters (DRDs) (e.g., ion chamber electroscopes and electronic dosimeters, which can be read by the user). Both PRDs and DRDs are necessary to document and assure worker safety. Dosimetry must be capable of measuring limiting and reporting exposure values, taking into account potential incident specific DRD to total effective dose (TED) conversion factors. For this reason, emergency workers operating within the plume exposure pathway EPZ will normally call for low and high range DRDs. For more information on dosimeters, refer to evaluation criterion K.3.

Plans/procedures identify the dosimetry, including DRDs and PRDs, used by emergency workers and include quantities of items needed, based on the number of emergency workers; quantities of equipment available, by type and model; and information details on 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 which organization will supply the equipment, including quantity available and estimated arrival time.

b. Portal Monitors

If portal monitors are used, plans/procedures provide inventory information, including equipment models, types, quantities, and locations. Plans/procedures also include information on backup equipment, including equipment models, types, quantities, locations, and backup electrical power for portal monitors without an independent backup supply.

c. Radiological Survey Instruments

Plans/procedures provide separate lists of the radiological survey instruments used by FMTs and those used by emergency workers at reception centers, and/or other locations, as needed. The equipment lists include quantities of instruments needed, based on the number of FMTs and reception center/other applicable location 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.

d. Air Sampling Equipment

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

e. Laboratory Analysis Equipment

Plans/procedures include inventory information on laboratory analysis equipment for each organization 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.

f. Mutual Aid Resources

If the incoming resources arrive with their own equipment (e.g., monitors and/or dosimetry), they will be evaluated by REP Program standards. FEMA will not inventory equipment that is not part of the REP Program. If an agency has a defined role in an ORO's plan, the agency is subject to the planning process and standards, as well as the guidance of this Manual.

REFERENCES

- ANSI N323AB-2013, American National Standard for Radiation Protection Instrumentation Test and Calibration, Portable Survey Instruments, June 27, 2014.
- 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, Third Edition, October 2017.

EVALUATION CRITERION H.11.a

Identification of the organization(s) responsible for the testing and maintenance of emergency equipment.

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

TO MEET THE INTENT OF EVALUATION CRITERION H.11.a, ORO PLANS/PROCEDURES INCLUDE:

- i. The organization(s) responsible for testing and maintenance of all emergency equipment.

EXPLANATION

Plans/procedures identify the organization(s) responsible for testing and maintaining all emergency equipment, including inventory, inspections, calibration, and operational checks.

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, Third Edition, October 2017.

EVALUATION CRITERION H.11.b

Calibration and operational checks of emergency equipment per national standards or the manufacturer's instructions, whichever is more frequent.

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

TO MEET THE INTENT OF EVALUATION CRITERION H.11.b, ORO PLANS/PROCEDURES INCLUDE:

- i. Specifics for maintaining and conducting calibration and operational checks of emergency equipment;
- ii. Tests to be performed on each type of equipment and who will complete those tests; and
- iii. Documentation methods for all testing and maintenance procedures performed.

EXPLANATION

Plans/procedures describe how operational checks and calibration are conducted and maintained for all emergency equipment identified in the ORO's plans/procedures, which may not be limited to the equipment described under evaluation criterion H.11. The testing and maintenance to be performed and appropriate frequency are described for each type of equipment, per the appropriate national standards or manufacturer's instructions, whichever is more frequent.

All operational checks and calibration is recorded by the individual(s) or organization(s) performing the procedures.

a. Dosimetry

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 to turn them in for processing, and instructions for handling and storing control badges. Plans/procedures address the methods and frequency for inspection of DRDs (e.g., checks for electrical leakage and calibration).

b. Portal Monitors

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 FEMA-REP-21, *Contamination Monitoring Standard for a Portal Monitor Used for Radiological Emergency Response*. Plans/procedures indicate that each monitor will be labeled with the date of the last operational check and date of the next calibration. It is suggested calibration be conducted annually, unless equally effective means are used to assure equipment response. As an example, field calibration can be accomplished by establishing a fixed geometry for a calibration source, comparing the indicated measurement to the true or expected reading, and recording measurements in an instrument log. Reliability of portal monitors is most often degraded during transport, assembly, and disassembly.

c. Radiological Survey Instruments

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). When instruments are used on a regular basis (i.e., in a lab or during inspections), quarterly operational checks may not be necessary. However, for instruments used infrequently (i.e., those in storage and not deployed to field assets), OROs complete operational checks periodically, when they come back from annual calibration, at deployment, and before use, or on a quarterly basis. Instruments being used to measure activity have accompanying documentation and/or a range of reading 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 normally performed at least annually unless more frequent calibration is specified by the manufacturer.

d. Air Sampling Equipment

When instruments are used on a regular basis (i.e., in a lab or during inspections), quarterly operational checks may not be necessary. However, for instruments used infrequently (i.e., those in storage and not deployed to field assets), OROs complete operational checks periodically, when they come back from annual calibration, at deployment, and before use, or on a quarterly basis.

e. Laboratory Equipment

Plans/procedures discuss methods and frequency of calibration for all types of laboratory equipment being used. If backup equipment is provided by another laboratory, the plans/procedures include the name of the laboratory and provide a summary of its capabilities. When instruments are used on a regular basis (i.e., in a lab or during inspections), quarterly operational checks may not be necessary. However, for instruments used infrequently (i.e., those in storage and not deployed to field assets), OROs complete operational checks periodically, when they come back from annual calibration, at deployment, and before use, or on a quarterly basis.

f. Mutual Aid Resources

Incoming mutual aid resources are expected to meet all calibration and operational checks described in this evaluation criterion. When instruments are used on a regular basis (i.e., in a lab or during inspections), quarterly operational checks may not be necessary. However, for instruments used infrequently (i.e., those in storage and not deployed to field assets), OROs complete operational checks periodically, when they come back from annual calibration, at deployment, and before use, or on a quarterly basis.

REFERENCES

- ANSI N323AB-2013, *American National Standard for Radiation Protection Instrumentation Test and Calibration, Portable Survey Instruments*, June 27, 2014.
- 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, Third Edition*, October 2017.

EVALUATION CRITERION H.12

Emergency kits are identified by general category. Contents and quantity of each emergency kit are specified in the emergency plan or other document(s) referenced in the emergency plan.

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

TO MEET THE INTENT OF EVALUATION CRITERION H.12, ORO PLANS/PROCEDURES INCLUDE:

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

EXPLANATION

Plans/procedures identify sufficient supplies of emergency equipment by category of kit (e.g., protective equipment, communications equipment, radiological monitoring equipment, and emergency supplies) and quantity of each item per kit. Protective equipment refers to clothing (e.g., booties, gloves, coveralls, rain suits, and 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 evaluation criterion I.6. 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, Third Edition, October 2017.

EVALUATION CRITERION H.13

Each organization identifies the location(s) for the receipt and analysis of field monitoring data and coordination of sample media, and identifies the organization(s) responsible for assessing radiological data.

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

TO MEET THE INTENT OF EVALUATION CRITERION H.13, ORO PLANS/PROCEDURES INCLUDE:

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

EXPLANATION

Plans/procedures identify the organization(s) responsible for assessing radiological data, location(s) for compiling and analyzing all field monitoring data, methods used by FMTs to relay information to the identified location(s), and means by which the data 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 applicable, 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 identified location(s). If a privately owned lab is used, a LOA is necessary.

REFERENCES

- FEMA-REP-2, Rev. 2, Guidance on Offsite Emergency Radiation Measurement Systems, Phase 1 – Airborne Release, June 1990.
- National Incident Management System, Third Edition, October 2017.
- Nuclear/Radiological Incident Annex to the Response and Recovery Federal Interagency Operational Plans, October 2016.

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.

EVALUATION CRITERION I.1

Capabilities for performing radiological assessment for all reactor core and spent fuel pool sources, individually and collectively, including response to events occurring simultaneously at all units on the NPP site, are described. These capabilities include:

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

EVALUATION CRITERION I.1.a

Methods for determining the magnitude and isotopic composition of an ongoing release of radioactive material through waterborne or airborne release pathways, or estimating these parameters for a potential release.

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

EVALUATION CRITERION I.1.b

A radiological assessment model for airborne releases that provides estimates of offsite radiation exposures and contamination levels using a dispersion model that is representative of the plant release points, topographical features, and meteorological regimes at the NPP site.

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

EVALUATION CRITERION I.1.c

A capability to coordinate and implement in-field radiological assessments by FMTs and provisions to assess the data obtained.

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

EVALUATION CRITERION I.2

Methods for assessing contamination of drinking water through liquid release pathways or deposition of airborne materials for NPP sites located on or near bodies of water from which public drinking water is drawn.

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

TO MEET THE INTENT OF EVALUATION CRITERION I.2, THE ORO PLANS/PROCEDURES INCLUDE:

- i. Methods and locations for sampling drinking water; and
- ii. Supporting laboratory procedures that demonstrate the capability to detect radioisotopes at derived response levels (DRLs) for the most sensitive population.

EXPLANATION

Plans/procedures include the method(s) and location(s) for sampling and assessing contamination in public drinking water.

The EPA PAG Manual identifies PAG levels for drinking water and corresponding DRLs for use during a radiological incident. It includes PAGs and DRLs for adults and for sensitive populations (e.g., those who are pregnant or nursing and children age 15 and younger). The PAG Manual provides specific DRLs for Sr-90, Cs-137, and I-131, as well as a methodology for determining DRLs for other nuclides. In order to provide for public protection, OROs must have the capability to determine when the PAG for sensitive populations is reached.

REFERENCES

- DOE/NV/25946—1558, Vol. 2, *Federal Radiological Monitoring and Assessment Center Monitoring Manual: Radiation Monitoring and Sampling*, July 2012.
- Environmental Protection Agency, *Webinar Protective Action Guides (PAGs) for Drinking Water*, November 2017.
- EPA-400/R-17/001, *PAG Manual: Protective Action Guides and Planning Guidance for Radiological Incidents*, January 2017.
- FEMA-REP-2, Rev. 2, *Guidance on Offsite Emergency Radiation Measurement Systems, Phase 1 – Airborne Release*, June 1990.
- SAND2010-2575P, Vol. 2, *Federal Radiological Monitoring and Assessment Center Assessment Manual: Pre-Assessed Default Scenarios*, February 2010.
- SAND2013-10382P, *Federal Radiological Monitoring and Assessment Center Laboratory Analysis Manual*, December 2013.
- SAND2017-7122R, Vol. 1, *Federal Radiological Monitoring and Assessment Center Assessment Manual: Overview and Methods*, November 2017.

EVALUATION CRITERION I.3

The capability and responsibility for monitoring the following parameters, which provide input to radiological assessments during an emergency, are described:

1. *Status of reactor fuel (e.g., no fuel damage, technical specification activity, clad failure, core melt).*
2. *Status of containment integrity.*
3. *Leakage of radioactive material from plant systems, structures, and components.*
4. *Status of engineered safety features used to mitigate the release of radioactive material to the environment (e.g., filters, containment spray, etc.).*
5. *Onset and duration of an actual release of radioactive material to the environment, or estimating these parameters for a potential release.*

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

EVALUATION CRITERION I.4

The methods and responsibility for determining the source term present in reactor coolant, containment atmosphere, and spent fuel pool area atmosphere are described.

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

EVALUATION CRITERION I.4.a

The contingency arrangements to obtain and analyze highly radioactive samples from the reactor coolant system, containment atmosphere and sump, and spent fuel pool storage area are described.

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

EVALUATION CRITERION I.5

The organizations responsible for FMT activities, and necessary resources, are identified.

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

TO MEET THE INTENT OF EVALUATION CRITERION I.5, THE ORO PLANS/PROCEDURES INCLUDE:

- i. The organizations responsible for FMT activities; and
- ii. The capabilities and resources of FMTs.

EXPLANATION

Plans/procedures specify the organizations responsible for conducting FMT activities and the necessary resources to perform such activities. This information includes the number of FMTs per shift and specific functions of each FMT (e.g., ambient monitoring or field sampling). 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 evaluation criterion A.4. Plans/procedures and LOAs clearly delineate activities performed by these non-governmental FMTs.

REFERENCES

- FEMA-REP-2, Rev. 2, Guidance on Offsite Emergency Radiation Measurement Systems, Phase 1 – Airborne Release, June 1990.
- National Incident Management System, Third Edition, October 2017.
- Nuclear/Radiological Incident Annex to the Response and Recovery Federal Interagency Operational Plans, October 2016.

EVALUATION CRITERION I.6

Each organization, where appropriate, provides methods, equipment, and expertise to make timely assessments of the actual or potential magnitude and locations of any radiological hazards through liquid or gaseous release pathways, including development of post-plume PARs for comparison to current Federal guidance.

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

TO MEET THE INTENT OF EVALUATION CRITERION I.6, ORO PLANS/PROCEDURES INCLUDE:

- i. The process for activating and notifying FMTs;
- ii. The composition of FMTs (e.g., organizations involved, number of teams [two or more], number of members on each team);
- iii. Means of transportation available for FMTs (e.g., four-wheel drive vehicles);
- iv. Estimated deployment times to reach monitoring or sampling locations, if applicable;
- v. Staging area location(s) that may be used as initial deployment points for FMTs;
- vi. The individual, by title/position, responsible for directing FMTs to proper locations for monitoring and air sampling;

- vii. The process for obtaining centerline and plume-edge measurements;
- viii. Monitoring, sampling, and communications equipment used by FMTs;
- ix. Procedures for field monitoring, sample collection, and field sample analysis and the calculations to be used to characterize the plume, specifically those used to determine radioiodine concentrations;
- x. The laboratories designated to analyze specific samples (specific radioisotopes), including associated estimated delivery and analysis times, transportation and temporary storage arrangements, and procedures for chain-of-custody records; and
- xi. Requirements for FMT members' radiological exposure control.

EXPLANATION

a. Activation and Notification

Plans/procedures describe the process for activating and notifying two or more FMTs, 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.

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. 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 Monitoring Team Composition

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 [HP] or health physics technician [HPT] and a driver, nontechnical and familiar with the area). 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

Plans/procedures identify types and sources of transportation available 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 needed to support the field monitoring operation.

d. Estimated Deployment Times and Staging Areas

Plans/procedures identify the time it takes activated FMTs to prepare and leave the point of origin. FEMA recommends that plans/procedures include the estimated time of arrival to reach sampling and monitoring locations.

The plans/procedures also identify any staging areas near each reactor site that will be used as initial deployment points for the FMTs.

e. Coordination and Direction of Field Monitoring Teams

Plans/procedures identify how the FMTs will be directed and coordinated, including identifying the individual(s), by title/position, responsible for coordination and where this individual(s) will be located. In an effort to maximize the efficiency of resources, Field Team Coordinators should work with other ORO Coordinators when multiple entities are in play. 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 exposure pathway EPZ, suitable for collecting air samples via open- and closed-window ambient exposure rate measurements.

f. Centerline and Plume-Edge Measurements

FMTs obtain peak plume measurements (centerline measurements), as well as plume-edge measurements, as described in 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. Plans/procedures also 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.

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. Communications Equipment

Plans/procedures indicate what communications equipment (e.g., radios and cellular telephones) FMTs will use to communicate with their base, each other, and FMT support personnel (e.g., sample couriers). For further information on communications equipment, see evaluation criterion F.1.b.

h. Field Monitoring and Sampling Equipment

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

(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 less, depending on adsorbent cartridge geometry. Collection efficiency, as provided by the manufacturer, should be available and the assumption should be made that a significant fraction of the radioiodine is in the form of methyl iodide.
- 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. Counting efficiency for Geiger-Mueller (G-M) detector is generally about 10% for particulate filters and 0.25% for silver zeolite cartridges.
- 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 – microRoentgen (μR) meter and/or count rate meter with thin-window G-M detector.
- Miscellaneous Supplies – plastic bags, gloves, shoe covers, markers, labels, etc.

i. 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 evaluation criterion H.11.b. 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 and account for natural variation.

(4) Air Sampling Procedures

If the radiological release is a particulate release, the procedures indicate that the number of air samples needed 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 – 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). 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 ($\mu\text{Ci}/\text{cc}$) 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.
- Calculations – Calculations used to characterize the plume are documented. Calculations should take into account:
 - Collection efficiency and sample volume are a function of flow rate.
 - Detection efficiency for G-M detectors, such as the HP 44-9 and HP-210, is approximately 10% for particulate filters and 0.25% for silver zeolite cartridges, unless documented analysis shows otherwise.

- 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. If field counts are not performed, samples must be transported to a laboratory within four hours of collection.

(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.

j. Laboratories

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 evaluation criterion C.4. Plans/procedures describe the arrangements for transporting samples and temporary storage of samples when needed. Plans/procedures clearly identify the estimated times needed to transport collected air samples to the designated laboratory(ies), perform the 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 mobile laboratories, if available, 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 evaluation criterion A.4.

Laboratories identified to analyze environmental samples must have documented procedures that demonstrate the capability to detect contamination at EPA relocation PAG DRL for soil samples and at FDA derived intervention levels (DILs) for food samples.

REFERENCES

- EPA-400/R-17/001, PAG Manual: Protective Action Guides and Planning Guidance for Radiological Incidents, January 2017.
- Federal Register, Vol. 63, No. 156, pp.43402-43403, Guidance on Accidental Radioactive Contamination of Human Food and Animal Feeds: Recommendations for State and Local Agencies; Availability, Food and Drug Administration, August 13, 1998.
- FEMA-REP-2, Rev. 2, Guidance on Offsite Emergency Radiation Measurement Systems, Phase 1 – Airborne Release, June 1990.
- Accidental Radioactive Contamination of Human Food and Animal Feeds: Recommendations for State and Local Agencies, April 1998.
- National Incident Management System, Third Edition, October 2017.

EVALUATION CRITERION I.7

The capability to detect and measure radioiodine concentrations in air in the plume exposure pathway EPZ as low as 10^{-7} $\mu\text{Ci}/\text{cc}$ (microcuries per cubic centimeter) under field conditions is described. The sample collection process takes into account the sample flow rate, collection efficiency of the sample media used to collect the sample, duration of the sample, counter efficiency, and background radiation, including interference from the presence of noble gases.

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

TO MEET THE INTENT OF EVALUATION CRITERION I.7, THE ORO PLANS/PROCEDURES INCLUDE:

- i. The capability to collect air samples within the plume exposure pathway EPZ and perform analysis that will detect radioiodine concentrations as low as 10^{-7} $\mu\text{Ci}/\text{cc}$ under field conditions;
- ii. The process used for collecting air samples, including location of sampling points, timing of sample collection, and techniques used to collect and count; and
- iii. Calculations that use factors consistent with the ORO specific procedures to calculate airborne radioiodine concentrations.

EXPLANATION

Early determination of the projected thyroid dose will be needed. An activity level of about 10^{-7} $\mu\text{Ci}/\text{cc}$ of radioiodine is required to make a thyroid dose calculation. Some plans/procedures call for the FMTs to make this measurement using portable instrumentation. Plans/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. Plans/procedures also state that interference from noble gas and background radiation does not decrease the stated minimum detectable activity.

See evaluation criterion I.6 for field monitoring and sampling procedures and equipment.

REFERENCE:

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

EVALUATION CRITERION I.8

A means is established for relating the various measured parameters (e.g., exposure rates, contamination levels, and air activity levels) to dose or dose rates. Provisions are made for estimating integrated dose from the projected and actual dose rates and for comparing these estimates with current Federal guidance. In addition, provisions are established to validate dose projections with field data and compare projections with other organizations also calculating dose projections. The detailed provisions are described in implementing procedures.

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

TO MEET THE INTENT OF EVALUATION CRITERION I.8, ORO PLANS/PROCEDURES INCLUDE:

- i. A description of personnel and equipment that will be involved in dose assessment;
- ii. A description of dose assessment computer software, including documentation and data input procedures, that will be used;
- iii. Alternate calculation methods that may be used (e.g., hand calculations);
- iv. Information/variables to run the model, including proper units of measure;
- v. Means for obtaining initial information (e.g., from licensee monitors or inventory estimates);
- vi. A description of how field data will verify and modify model results; and
- vii. Procedures for comparing dose results with those of other organizations that perform dose assessments.

EXPLANATION

Plans/procedures for the state, and for local and tribal governments where applicable, describe the methods to estimate actual or projected doses to the public in terms that may be compared with both the current EPA PAGs and FDA DILs.

Plans/procedures address how activities to fulfill this evaluation criterion will be addressed during each of the three phases for radiological incident activities: early, intermediate, and late. More information on radiological incident activities can be found within evaluation criterion M.1.

REFERENCES

- EPA-400/R-17/001, PAG Manual: Protective Action Guides and Planning Guidance for Radiological Incidents, January 2017.
- Federal Register, Vol. 63, No. 156, pp.43402-43403, Guidance on Accidental Radioactive Contamination of Human Food and Animal Feeds: Recommendations for State and Local Agencies; Availability, Food and Drug Administration, August 13, 1998.
- FEMA-REP-2, Rev. 2, Guidance on Offsite Emergency Radiation Measurement Systems, Phase 1 – Airborne Release, June 1990.
- Accidental Radioactive Contamination of Human Food and Animal Feeds: Recommendations for State and Local Agencies, April 1998.

EVALUATION CRITERION I.9

Arrangements to locate and track the airborne radioactive plume are made using available resources, which includes Federal, state, local, and tribal governments, and/or licensee resources. Provisions are made to characterize the plume including taking peak plume measurements. Identification of the plume, includes determining a measurement that is high enough to be reasonably above background radiation readings and sufficient enough to indicate submersion within the plume.

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

TO MEET THE INTENT OF EVALUATION CRITERION I.9, ORO PLANS/PROCEDURES INCLUDE:

- i. Planned use of 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

Evaluation criterion I.6 discusses the detailed description of FMT procedures for plume monitoring. If the state, local, or tribal government plan to track and define only the outer edges of the plume, then the plans/procedures reference arrangements for outside resources to take measurements and collect air samples from peak exposure rate areas near the plume's peak concentration, also known as centerline measurements. For example, organizations may rely on Federal, licensee, or university, contractor, mutual-aid, etc. FMT data. These arrangements are established in LOAs, as appropriate. LOAs are referenced in the plans/procedures, as described in evaluation criterion A.4.

REFERENCES

- FEMA-REP-2, Revision 2, *Guidance on Offsite Emergency Radiation Measurement Systems, Phase 1 – Airborne Release*, June 1990.
- *Nuclear/Radiological Incident Annex to the Response and Recovery Federal Interagency Operational Plans*, October 2016.

EVALUATION CRITERION I.10

Organizations directly responsible for radiological monitoring, analysis, and dose projections describe the capability for coordinating monitoring efforts, tracking and trending data, and sharing analytical results with other organizations performing radiological assessment functions.

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

TO MEET THE INTENT OF EVALUATION CRITERION I.10, ORO PLANS/PROCEDURES INCLUDE:

- i. Methods of integrating monitoring and analytical augmentation and support from other state, licensee, educational and research facilities, and government and private organizations; and
- ii. Procedures and responsibilities for integrating Federal agency monitoring, analysis, and data management support.

EXPLANATION

During a radiological incident, numerous Federal, state, and local government and private resources will become available to OROs. Though response and decision-making remains a state, tribal, and/or local responsibility, plans/procedures must include integration of these resources/assets and information sharing. Plans should include coordination and integration with the National Nuclear Security Administration (NNSA) Radiological Assistance Program (RAP) Teams, the FRMAC, the Advisory Team for the Environment, Food, and Health (A-Team), as well as other agencies and assets.

REFERENCES

- FEMA-REP-2, Revision 2, *Guidance on Offsite Emergency Radiation Measurement Systems, Phase 1 – Airborne Release*, June 1990.
- *Nuclear/Radiological Incident Annex to the Response and Recovery Federal Interagency Operational Plans*, October 2016.

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. ETEs have been developed by applicants and licensees. Licensees shall update ETEs on a periodic basis. 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.

EVALUATION CRITERION J.1

The means and time required to alert, notify, and provide a range of protective actions for onsite individuals and individuals who may be in areas controlled by the licensee (including members of the public) during a radiological incident are described.

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

EVALUATION CRITERION J.1.a

Provisions are made for evacuation of onsite non-essential personnel at an SAE or General Emergency (GE).

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

EVALUATION CRITERION J.2

Provisions are made and coordinated with appropriate offsite entities for evacuation routes and transportation for onsite individuals to a suitable offsite location. Selection of location considers the potential for inclement weather, high traffic density, and potential radiological conditions. Alternate location(s) and route(s) are identified.

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

TO MEET THE INTENT OF EVALUATION CRITERION J.2, ORO PLANS/PROCEDURES INCLUDE:

- i. A description of assistance provided to licensees during an onsite evacuation or a statement that no assistance is required;
- ii. The offsite location where onsite individuals will be transported;
- iii. Alternative offsite location(s) and evacuation route(s) for use during inclement weather, when there is high traffic density, and/or during potential radiological conditions; and
- iv. Provisions for coordinating arrangements with other OROs to expedite evacuation of onsite personnel.

EXPLANATION

In cases where the licensee evacuates onsite personnel and ORO assistance is requested, ORO plans/procedures describe how assistance will be provided to licensees. For example, how OROs will manage the flow of traffic from the NPP to the designated offsite location. Plans/procedures take into account conditions such as inclement weather, high traffic density, and/or potential radiological conditions and address alternate offsite location(s) and evacuation route(s). Given that the nature of the incident onsite may affect the ability of a specific ORO to respond or may need multiple OROs, plans/procedures describe provisions for coordinating evacuation/transportation arrangements of onsite individuals with other OROs to expedite or assist.

REFERENCES

- FEMA Comprehensive Preparedness Guide 101, *Developing and Maintaining Emergency Operations Plans*, Version 2.0, November 2010.
- National Incident Management System, Third Edition, October 2017.

EVALUATION CRITERION J.3

Provisions for radiological monitoring and decontamination, if necessary, of personnel evacuated from the NPP site are described.

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

EVALUATION CRITERION J.4

The capability to account for all individuals inside the NPP Protected Area following declaration of an SAE or GE is described. The names of missing individuals are ascertained within 30 minutes following the emergency declaration and accountability is maintained for the duration of the incident. This capability includes provisions for prompt accountability following events that may preclude completion within 30 minutes (e.g., hostile action).

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

EVALUATION CRITERION J.5

Provisions are made for personal radiological protection for individuals arriving or remaining onsite during the incident.

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

EVALUATION CRITERION J.6

The basis and methodology are established for the development of PARs for the responsible OROs, including evacuation, sheltering, and, if appropriate, radioprotective drug use, for the plume exposure pathway EPZ. Current Federal guidance is used.

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

TO MEET THE INTENT OF EVALUATION CRITERION J.6, ORO PLANS/PROCEDURES INCLUDE:

- i. The rationales used to make initial and subsequent PARs;
- ii. The basis and methodology used in developing PARs, including references to applicable Federal guidance; and
- iii. The basis and methodology used in developing PARs involving radioprotective drugs, including references to applicable Federal guidance.

EXPLANATION

This evaluation criterion is only applicable to the OROs designated with the responsibility to develop PARs.

PARs are recommended measures to be taken in anticipation of, or in response to, a release of radioactive material into the environment. Sheltering and evacuation are the two PARs used to limit direct exposure of the general public within the plume exposure pathway EPZ. OROs may consider KI as a supplementary protective action.

Plans/procedures describe the basis and methodology for developing PARs, or some combination thereof, which provides the greatest protection to the public. Plans/procedures describe the factors considered in developing a PAR (e.g., meteorological data, plant conditions, release data, dose projection modeling, field measurements, topography and population in the area, etc.) and identify the source of information used. The methodology should thoroughly consider all available information and factors that may impact implementation of a PAR. Each prospective PAR is compared and considered, such as the ability to safely evacuate versus the protection provided by a structure when sheltering.

a. Initial Protective Action Recommendations

Initial PARs may be based on plant status information; however, it is not necessary to wait for calculations of projected dose from the NPP site. For an incident at a site involving actual or significant potential for offsite consequences, it may be appropriate to immediately take protective actions without waiting for release rate information or environmental measurements. The PAR development process takes into account the onsite officials' uncertainty of site conditions and uncertainty or unfavorable prognosis of events controlling the incident. During the PAR development process, it is necessary to review factors that may affect or impede an evacuation, such as characteristics of the area, population groups requiring special assistance, adverse weather conditions, direction of the plume, a HAB incident, etc. In addition to reviewing factors that impact an evacuation, this process considers protection factors for direct exposure and from inhalation exposure in shelters. Conclusions based on these considerations and factors are included in the plans/procedures.

The following are general considerations:

- A GE is the first ECL where protective actions would be expected.
- For the worst core melt sequences, immediate life-threatening doses would generally not occur outside the plume exposure pathway EPZ.
- Significant uncertainty will be associated with any prediction or model. Dose assessment should use the best information available; as data improves, dose assessment should verify and/or update recommendations.

The following should be considered when choosing between evacuation and/or sheltering as a recommendation:

- The EPA PAG Manual takes into consideration the reduction in the average dose that results from sheltering; therefore, the projected dose will be compared to the PAGs and there is no need to take into account dose reduction that results from sheltering. Consideration of sheltering effectiveness is only appropriate for evaluating whether or not sheltering will provide overall greater protection than evacuation.
- When weighing protective action options, the worst case protection factor should be considered for dwellings within the affected area, e.g., if a portion of the population occupies wood frame houses, use that protection factor even though a majority occupies large apartment buildings.
- The effectiveness of sheltering decreases with time as outside air infiltrates the building. In some instances, the protection factor of a dwelling can be negated after two hours. Additionally, buildings should be ventilated promptly after plume passage to prevent continued exposure to infiltrated radioactive material.
- For incidents where the principal source of dose is inhalation, evacuation could potentially increase exposure if it is implemented during the immediate passage of a plume; the air inside a vehicle rapidly equalizes with the air outside, even when all of the windows and vents are closed.
- 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.
- When dose projections are at levels less than 1 rem over the first four days, evacuation is not recommended due to the associated risks of moving large numbers of people.

Because of the significant uncertainties in the potential source term, the minimal dose reduction available from sheltering, and the possibility of high doses near the site, evacuation is typically the most practical initial protective action at the time of the incident. This determination is based solely on plant status information without dose projection calculations.

Sheltering-in-place is a low-cost, low-risk protective action that can provide protection with an efficiency ranging from zero to almost 100 percent, depending on the type of release, the type of shelter available, the duration of the plume passage, and climatic conditions. Because of these advantages, planners and decision-makers may consider implementing sheltering-in-place when projected doses are below 1 rem over the first four days. Sheltering-in-place should be preferred to evacuation whenever it provides equal or greater protection. After confirmation that the plume has passed, continued sheltering-in-place should be re-evaluated by public officials. Sheltering-in-place followed by informed evacuation may be most protective. The risk to health from a protective action should not exceed the risk to health from the dose that would be avoided.

Authorities with the responsibility for making decisions are identified in plans/procedures and appropriate provisions are made to communicate recommendations to those identified authorities. Coordination between the state, locals, and licensee on recommended PARs are described in plans/procedures.

b. Subsequent Protective Action Recommendations

For subsequent PARs, if source term or environmental data is available, the results of dose projection calculations are considered in the decision-making process. The methodology used for such dose projections is covered under evaluation criterion I.8. The plans/procedures delineate the decision-making 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. It is important to consider factors such as radiological source term in containment when expanding initial PARs. Changes in wind direction following the initial PAR and prior to a release is also an important consideration when expanding PARs.

c. Protective Action Recommendations Involving Radioprotective Drug Use

Plans/procedures also describe the basis for considering the recommendation for use of radioprotective drugs. Plans/procedures identify groups that might be advised to take radioprotective drugs. Plans/procedures consider plant conditions, offsite conditions, potential or actual release pathway, and isotopic mix as appropriate in developing recommendations for the use of radioprotective drugs. References to appropriate Federal guidance are used when developing PARs involving radioprotective drugs.

REFERENCES

- DOE/EH-0159T, *Effectiveness of Sheltering-in-place in Buildings and Vehicles for Plutonium*, July 1990.
- EPA-400/R-17/001, *PAG Manual: Protective Action Guides and Planning Guidance for Radiological Incidents*, January 2017.
- *National Incident Management System*, Third Edition, October 2017.

EVALUATION CRITERION J.7

A site-specific protective action strategy or decision-making process, informed by the ETE study, is coordinated between the licensee and OROs. Current Federal guidance is used.

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

TO MEET THE INTENT OF EVALUATION CRITERION J.7, ORO PLANS/PROCEDURES INCLUDE:

- i. A site-specific protective action strategy or decision-making process that is coordinated between the licensee and OROs;
- ii. References to current Federal guidance and methodologies used in developing the protective action strategy or decision-making process; and
- iii. Specific information from the evacuation time estimate (ETE) study used to develop protective action strategies.

EXPLANATION

A site-specific protective action strategy and decision-making process, establishes site-specific PAR procedures for the licensee and provides guidance for appropriate ORO decision-makers, as well as plans for various factors that may impact the implementation of a protective action (e.g., evacuation, sheltering, or combination of both) in advance of an incident.

A protective action strategy/decision-making process is coordinated between the licensee and ORO.

Plans/procedures take into consideration current site-specific ETE studies when developing protective action strategies/and/or decision-making processes. Factors such as population densities and fluctuation related to transient populations, road capacity, and access and functional needs facilities and/or populations in each subarea of the plume exposure pathway EPZ are considered and should be used to inform the development of site-specific strategies/decision-making processes. Protective action strategies/decision-making processes incorporate current Federal guidance and methodologies, and are appropriately referenced in plans/procedures.

a. Strategy Considerations

Under rapidly progressing severe accident scenarios with long evacuation times, sheltering-in-place may provide more immediate protection than radial evacuations. Adequate and clear instructions to the public on sheltering-in-place may help reduce shadow evacuations. Extreme weather conditions, such as inversions, significant precipitation, or no wind can change the protective impacts of sheltering-in-place.

When considering evacuations, staged evacuations as an initial protective action can limit exposures of those populations closest to the site. Staged evacuations can reduce evacuation times by allowing the early movement of some populations while traffic and access control points (TCPs/ACPs) are established. Additionally, staged evacuations have the added benefit of speeding up decision making times, decreasing demand on ORO traffic control and reception center resources and reducing public disruption. For sites in which the 90% ETE for the general public is less than approximately three hours, evacuation is the most appropriate protective action. For sites where the ETE is more than three hours for 90% of the population to evacuate, protective actions listed in the Exhibit II-2 are most beneficial.

Exhibit II-2: Recommended Protective Actions for Evacuation Using ETE Data

Zone	Protective Action
0 to 2 mile	If the 90% ETE for this area is 2 hours or less, immediate evacuate
2 to 5 mile	If the 90% ETE for this area is 3 hours or less, immediately evacuate
5 to 10 mile	Shelter-in-place, then evacuate when safe to do so

Other considerations in developing protective action strategies/decision-making processes include wind persistence. Licensees perform wind persistence analysis as part of their Final Safety Analysis Report (FSAR). Typical site meteorology can inform the protective action strategy. For example, if typical site meteorology includes wind shifts on a time scale that is shorter than the ETE for the downwind 2 to 5 mile sectors, this information can be used for planning purposes, to include all appropriate sectors rather than waiting for the wind to shift to occur. If decision-makers wait for the wind shift to occur and they may then have to expand evacuation while the initial evacuation is still in progress. Multiple changes to protective actions directions could undermine credibility and increase shadow evacuation and overall evacuation times.

REFERENCES

- 10 CFR Part 50, Appendix E, Section IV, paragraph 3.
- EPA-400/R-17/001, PAG Manual: Protective Action Guides and Planning Guidance for Radiological Incidents, January 2017.
- National Incident Management System, Third Edition, October 2017.

- NUREG/CR-6863/SAND2004-5900, *Development of Evacuation Time Estimates Studies for Nuclear Power Plants*, January 2005.
- NUREG/CR-6953/SAND2007-5448P, Vol. 1, *Review of NUREG-0654, Supplement 3, 'Criteria for Protective Action Recommendations for Severe Accidents'*, December 2007.
- NUREG/CR-6953/SAND2010-2806P, Vol. 3, *Review of NUREG-0654, Supplement 3, 'Criteria for Protective Action Recommendations for Severe Accidents'—Technical Basis for Protective Action Strategies*, August 2010.
- NUREG/CR-7002/SAND2010-0016P, *Criteria for Development of Evacuation Time Estimate Studies*, November 2011.

EVALUATION CRITERION J.8

The latest ETEs are:

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

TO MEET THE INTENT OF EVALUATION CRITERION J.8, ORO PLANS/PROCEDURES INCLUDE:

- i. The latest ETE information to plan for an evacuation.

EXPLANATION

ETEs are considered when planning for an evacuation. ETEs calculate the time it would take to evacuate the public within the plume exposure pathway EPZ under emergency conditions. The licensee is responsible for conducting and updating the ETE. 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 is updated at any time during the 10-year period if the following situations occur:

1. The plume exposure pathway EPZ permanent resident population time estimate increases and causes the longest ETE value for the 2-mile or 5-mile zone, including affected emergency response planning areas; or
2. The entire plume exposure pathway EPZ changes by 25 percent or 30 minutes, whichever is less, from the licensee's currently approved ETE.

Current and accurate ETE information is an essential piece in ORO plans/procedures for planning and conducting an evacuation. Primary elements of an ETE, such as population and roadway capacity are periodically evaluated and subsequently updated to determine if there is an impact on the ETE. The population review not only addresses increases in population, but also assesses changes in age demographics and individuals with access and functional needs. The roadway capacity assessment includes review of transportation improvements, constraints, traffic flow, and changes in transient traffic flow through the EPZ.

REFERENCES

- National Response Framework, *Mass Evacuation Incident Annex*, June 2008.
- NUREG/CR-6863/SAND2004-5900, *Development of Evacuation Time Estimates Studies for Nuclear Power Plants*, January 2005.
- NUREG/CR-7002/SAND2010-0016P, *Criteria for Development of Evacuation Time Estimate Studies*, November 2011.

EVALUATION CRITERION J.8.a

Incorporated either by reference or in their entirety into the emergency plan.

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

EVALUATION CRITERION J.8.b

Incorporated either by reference or as a summary of the latest ETE analysis into the emergency plan.

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

TO MEET THE INTENT OF EVALUATION CRITERION J.8.b, ORO PLANS/PROCEDURES INCLUDE:

- i. A reference or summary of the latest ETE analysis used for evacuation planning;
- ii. Time estimates for evacuation of various sectors or evacuation areas;
- iii. Time estimates for movement of populations in specific areas, particularly for individuals with access and functional needs;
- iv. Evacuation routes and traffic capacities of evacuation routes; and
- v. Potential use of alternate evacuation routes.

EXPLANATION

Plans/procedures contain or reference a summary of the latest ETEs, provided by the licensee, for evacuation planning of the general public and individuals with access and functional needs.

ETE information incorporated into plans/procedures may include time estimates for evacuation of various sectors and/or evacuation areas, time estimates for moving populations in specific areas, particularly individuals with access and functional needs that require evacuation assistance (e.g., school children, those with access and functional needs, etc.), evacuation routes and evacuation areas, and traffic capacities of evacuation routes. Plans/procedures include maps displaying evacuation routes and evacuation areas for use in development of PARs and PADs.

Consideration is given for the potential need to use alternate routes because of traffic impediments, adverse weather conditions, airborne radioactive plume, areas affected by hostile actions or other factors that can hinder timely, safe evacuation.

REFERENCES

- EPA-400/R-17/001, PAG Manual: Protective Action Guides and Planning Guidance for Radiological Incidents, January 2017.
- National Response Framework, Mass Evacuation Incident Annex, June 2008.
- NUREG/CR-6863/SAND2004-5900, Development of Evacuation Time Estimates Studies for Nuclear Power Plants, January 2005.
- NUREG/CR-7002/SAND2010-0016P, Criteria for Development of Evacuation Time Estimate Studies, November 2011.

EVALUATION CRITERION J.9

PARs are provided, in a timely manner, directly to the designated ORO(s) responsible for making protective action decisions (PADs) within the plume exposure pathway EPZ.

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

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

- i. Process for communicating PARs to designated OROs responsible for making PADs.

EXPLANATION

This evaluation criterion is only applicable to the licensee or other designated ORO(s) responsible for providing PARs to designated OROs responsible for making PADs.

PARs are based on available information and when developed, are communicated immediately, with a sense of urgency and without undo delay to OROs responsible for making PADs within the plume exposure pathway EPZ. ORO plans/procedures, as applicable, include the communication process for the timely delivery of PARs.

REFERENCES

- National Incident Management System, Third Edition, October 2017.

EVALUATION CRITERION J.10

Plans include maps, charts, or other information that demonstrate the following for the plume exposure pathway EPZ:

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

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

- Clear and legible maps, charts, and other pertinent plume exposure pathway EPZ information necessary to support emergency response.

EXPLANATION

Plans/procedures contain, possibly in a separate appendix, clear and legible maps of features or landmarks, charts, and other pertinent information in the plume exposure pathway EPZ necessary in supporting emergency response. Geographic information systems (GIS) data and products, as outlined in plans/procedures, may be used.

In addition to information described in evaluation criteria J.10.a and J.10.b, map data may also include the various sectors and planning areas, also referred to as emergency response planning areas, in the plume exposure pathway EPZ; roads; streams; towns; radiological monitoring and decontamination facilities (if not performed at designated reception/relocation centers); radiological monitoring and sampling points; and other identified special/public health facilities.

REFERENCES

- FEMA Comprehensive Preparedness Guide 101, *Developing and Maintaining Emergency Operations Plans*, Version 2.0, November 2010.
- National Incident Management System, Third Edition, October 2017.

EVALUATION CRITERION J.10.a

Evacuation routes, evacuation areas, reception centers in host areas, and shelter areas.

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

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

- Clear, legible maps of all evacuation routes, evacuation areas, reception/relocation centers in host jurisdictions, and shelter areas/congregate care centers.

EXPLANATION

Plans/procedures contain, possibly in a separate appendix, clear and legible maps of key information pertinent to emergency response during the early phase of an incident, including evacuation routes, evacuation areas, reception/relocation centers in host areas, and shelter areas/congregate care centers. OROs may use GIS data and products, as outlined by plans/procedures.

Evaluation criteria P.3 and P.4 provide further guidance on the procedures and individual(s), by title/position, responsible for updating and maintaining maps, respectively.

REFERENCES

- EPA-402/K-17/003, *Protective Action Area Map Templates*, September 2017.
- FEMA Comprehensive Preparedness Guide 101, *Developing and Maintaining Emergency Operations Plans*, Version 2.0, November 2010.
- FEMA GM-21, Rev.1, *Acceptance Criteria for Evacuation Plans*, February 29, 1984.
- *National Incident Management System*, Third Edition, October 2017.

EVALUATION CRITERION J.10.b

Population distribution around the NPP site by evacuation areas.

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

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

- i. Clear, legible maps, charts, or other information showing population distribution around the NPP site by evacuation areas.

EXPLANATION

Plans/procedures include, possibly in a separate appendix, maps that clearly and legibly show population distribution, by evacuation areas, around the NPP site. OROs may use GIS data and products, as outlined by plans/procedures. These maps identify school populations, agencies and organizations that provide functional needs support services (FNSS), and the maximum anticipated population at recreation areas, or provide reference to where this information may be found.

REFERENCES

- FEMA Comprehensive Preparedness Guide 101, *Developing and Maintaining Emergency Operations Plans*, Version 2.0, November 2010.
- FEMA GM-21, Rev.1, *Acceptance Criteria for Evacuation Plans*, February 29, 1984.
- *National Incident Management System*, Third Edition, October 2017.

EVALUATION CRITERION J.11

A capability for implementing protective actions based on current Federal guidance is established. The process ensures coordinated implementation of PADs with all appropriate jurisdictions. The process for implementing protective actions for the plume exposure pathway EPZ is described and includes the following:

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

TO MEET THE INTENT OF EVALUATION CRITERION J.11, ORO PLANS/PROCEDURES INCLUDE:

- i. The process for considering PARs provided;
- ii. Procedures for making PADs and the rationale for initial and subsequent PADs;
- iii. Procedures for implementing protective actions based upon PAGs that are consistent with EPA recommendations; and
- iv. The process to ensure coordination of PADs with all appropriate jurisdictions.

EXPLANATION

The plans/procedures describe the process and timeframe for making and implementing initial PADs, based on the licensee's notification of NPP status, PARs received from licensee and/or appropriate ORO authorities, and other appropriate/relevant input. The plans/procedures describe the capability to respond to a rapidly escalating incident and contain predetermined PADs to protect the public in these situations. Plans/procedures may allow for precautionary evacuation of individuals with access and 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

Plans/procedures include numerical dose values to be used to develop PARs and the means to determine the appropriate value to use for the situation and conditions. These numerical dose values will most often be based on the EPA PAGs (1-5 rem TED), with evacuation preferred for areas where projected doses exceed the lower end of the range (1 rem TED) except when a high risk environment or high risk group is involved. Plans/procedures should provide flexibility where doses up to the upper end of the PAG range may be the preferred decision criteria.

Typically, it is not necessary to calculate or compare risks associated with evacuation, sheltering, and/or radiation dose during an emergency response, as these calculations and assessments were considered when developing the site-specific protective action strategy/pre-planned decision-making process and are an essential part of the EPA PAGs. For areas within the plume exposure pathway EPZ not being recommended for evacuation, ORO plans/procedures include instructions for the public to stay indoors and await additional instructions. The decision to substitute sheltering for evacuation at projected doses up to 5 rem TED 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.

b. Protective Action Decision-Making

For an incident involving actual or potential significant 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, a 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 a 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 versus the risk of sheltering-in-place. If the decision is to evacuate some or all of the population in the plume exposure pathway 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.

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

REFERENCES

- EPA-400/R-17/001, PAG Manual: Protective Action Guides and Planning Guidance for Radiological Incidents, January 2017.
- Federal Register, Vol. 63, No. 156, pp.43402-43403, Guidance on Accidental Radioactive Contamination of Human Food and Animal Feeds: Recommendations for State and Local Agencies; Availability, Food and Drug Administration, August 13, 1998.
- FEMA Comprehensive Preparedness Guide 101, Developing and Maintaining Emergency Operations Plans, Version 2.0, November 2010.
- National Incident Management System, Third Edition, October 2017.

EVALUATION CRITERION J.11.a

Means for identifying and protecting residents who would have difficulty in implementing protective actions without assistance. This includes those with access and functional needs, transportation-dependent residents, those in special facilities, and those in correctional facilities. These means include notification, support, and assistance in implementing protective actions where appropriate.

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

TO MEET THE INTENT OF EVALUATION CRITERION J.11.a, ORO PLANS/PROCEDURES INCLUDE:

- i. The means to protect those with impaired mobility because of institutionalization or other confinement (e.g., children in schools or licensed day cares and persons in nursing homes, hospitals, and correctional facilities);
- ii. Methods for determining the number and location, by evacuation area, of residents, in the plume exposure pathway EPZ who may need assistance, including the type of assistance required;
- iii. The means for notifying residents needing assistance;
- iv. Reference lists of documented individuals requiring assistance in an evacuation of the plume exposure pathway EPZ and process for keeping the list(s) up-to-date;
- v. Process for evacuating identified residents and for sheltering those who cannot be moved; and
- vi. Transportation needs or resources for these groups, including types and quantities of vehicles.

EXPLANATION

a. Identified Individuals Needing Evacuation Assistance

There are multiple subsets of individuals that may have difficulty implementing protective actions, such as evacuation or sheltering, without assistance. Such individuals may include, but are not limited to, those with access and functional needs (e.g., those with access and functional needs, those who are transportation-dependent, etc.), those who may live in a facility, such as an assisted living community or skilled nursing home, or children or adults whose mobility is impaired due to institutional or other confinement. Plans/procedures describe the means for protecting all these subsets of individuals, including how they will be notified, and the type of support and assistance that will be required to assist them in implementing protective actions. Plans/procedures include the means for determining the number of individuals requiring assistance and the type of assistance that will be required. For each resident needing assistance, plans/procedures include

or reference contacts, and written agreements when applicable, to provide communication and physical assistance as well as transportation providers. Plans/procedures include the written agreements made with hospitals, medical/healthcare facilities, adult care facilities, and community mental health centers outside the plume exposure pathway EPZ to receive these individuals. For individuals requiring assistance of service animals, the plans/procedures also include provisions for the animals' protection and accommodation.

For identified individuals who need assistance implementing protective actions, plans/procedures include:

- The list of individuals that have been identified as needing assistance with implementing protective actions and the process for keeping the list current (e.g., working with the designated authority(ies) or organization(s) responsible for collecting the names and information of these individuals). This list is maintained by the appropriate local and/or tribal government organization(s) (e.g., local emergency management agency) and may be included by reference. Additional discussion of the methods used to identify these individuals can be found with evaluation criterion G.1;
- A 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; and
- An up-to-date estimate of transportation needs and list of resources, including types and quantities.

b. Schools

Plans/procedures stipulate that OROs, as appropriate, will take the initiative to identify and contact all schools within the plume exposure pathway EPZ to ensure that school officials have plans/procedures in place for protecting the health and safety of children under their care in the event of an incident.

Plans/procedures also include the following:

- Identification of all schools (i.e., public and private, kindergartens, and preschools) within the plume exposure pathway EPZ;
- Identification of the organization and individuals, by title/position, responsible for both planning and implementing the protective actions at each identified school;
- School-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 reception/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 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.

c. Hospitals and Medical/Health Care Facilities

Plans/procedures identify the hospitals and other medical/healthcare facilities within the plume exposure pathway EPZ, including a point of contact and the individual(s), by title/position, responsible for planning and implementing protective actions for these facilities.

Plans/procedures describe the means for protecting patients in hospitals and other medical/healthcare facilities, including the means of evacuating patients and the actions to protect patients who cannot be relocated.

Plans/procedures should have some form of communication protocol in place to prevent traversing the plume during an evacuation. However, if traversing the plume is unavoidable, plans/procedures should account for the transport going to a reception/relocation 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 patients.

The Joint Commission requires hospitals to have plans to provide for radioactive isolation and decontamination. Additionally, Occupational Safety Health Act (OSHA) published *OSHA 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 other agencies place requirements on hospitals to prepare for contaminated patients, the REP Program has no need to evaluate these facilities' evacuation plans, nor does the ORO have the responsibility to provide training or dosimetry to facilities receiving transfer patients from the evacuation zone.

d. Licensed Day Cares, Nursing Homes, and Other Special Facilities

Plans/procedures identify the licensed day cares, nursing homes, and other special facilities within the plume exposure pathway EPZ, including a point of contact and the individual(s), by title/position, responsible for planning and implementing protective actions for these facilities.

Plans/procedures describe the means for protecting these individuals, including how facilities will be notified to evacuate (e.g., when other special facilities are notified or as part of the notification of the general public).

When estimating transportation needs and/or other potential resources, potential assistance that may be needed for these facilities should be considered. The ability to contact these facilities, or for them to initiate contact, should also be considered.

e. Correctional Facilities

Plans/procedures identify correctional facilities within the plume exposure pathway EPZ, including a point of contact and the individual(s), by title/position, responsible for planning and implementing protective actions for the correctional facility populations.

Plans/procedures describe the means for protecting correctional facility populations, including any planned protective actions.

REFERENCES

- Federal Register, Vol. 81, No. 180, pp. 63859-64044, *Medicare and Medicaid Programs; Emergency Preparedness Requirements for Medicare and Medicaid Participating Providers and Suppliers; Final Rule*, Centers for Medicare and Medicaid Services, September 16, 2016.
- FEMA Comprehensive Preparedness Guide 101, *Developing and Maintaining Emergency Operations Plans*, Version 2.0, November 2010.
- National Response Framework, *Mass Evacuation Incident Annex*, June 2008.
- Occupational Safety Health Act, *OSHA Best Practices for Hospital-Based First Receivers of Victims from Mass-Casualty Incidents*, January 2005.
- Post-Katrina Emergency Management Reform Act of 2006, Pub. L. No. 109-295, §§ 641-654 (2006) (codified as amended at 6 U.S.C. §§ 741-754).
- The Joint Commission: Hospital, Emergency Management Chapter, *Standard EM.02.02.05*, July 2012.

EVALUATION CRITERION J.11.b

The decision-making methodologies for use of radioprotective drugs and the provisions for administration to the general public, emergency workers, and institutionalized persons within the plume exposure pathway EPZ. This includes the means of determining quantities, maintaining and managing supplies, communicating recommendations, and distributing.

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

TO MEET THE INTENT OF EVALUATION CRITERION J.11.b, ORO PLANS/PROCEDURES INCLUDE:

- i. The individual(s), by title/position, with the authority to make decisions regarding the use of radioprotective drugs during an emergency;
- ii. The criteria and decision-making processes for recommending the use of radioprotective drugs;
- iii. Groups who may be advised to take radioprotective drugs;
- iv. A description of the adequate supply of radioprotective drugs for each individual in the plume exposure pathway EPZ, including quantities, storage locations, and means of distribution;
- v. A description of the adequate maintenance, shelf life extensions, and timely replacement of radioprotective drugs; and
- vi. 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 evaluation criterion focuses on implementation of KI use, including maintenance of KI supplies, distribution, and record keeping. Evaluation criteria J.6 and J.7 focuses on the decision-making processes leading to KI use.

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 incident. The plans/procedures describe the criteria for determining whether KI is to be administered, including criteria for the general public, emergency workers, and institutionalized persons within the plume exposure pathway EPZ, if applicable.

Guidance on KI administration is provided in the EPA PAG Manual and the FDA Federal Register notice, *Guidance on Use of Potassium Iodide as a Thyroid Blocking Agent in Radiation Emergencies*. The plans/procedures identify what groups might be instructed or advised to use KI, including emergency workers, particular institutions within the plume exposure pathway EPZ whose populations could not be evacuated quickly, and, if applicable, the general population. ORO plans/procedures consider the following provisions for KI administration to the general public, emergency workers, and institutionalized populations:

- For the general public, KI is considered as a supplementary protective action to be taken concurrently with evacuation or sheltering-in-place. The EPA recommends KI be administered to the general public when the thyroid dose of a one year old is projected to exceed 5 rem. FDA provides KI dosage and administration guidance based on age. OROs should only consider recommending KI if there is iodine present and the public may be exposed to the plume.
- For emergency workers, KI should be administered when radioactive iodine is projected or detected in the atmospheric release. Emergency response organizations that do not routinely distribute KI to emergency workers, but rather distribute KI based on incident and release characteristics, the plans/procedures clearly identify the method and time needed to complete the distribution. The plans/procedures also identify how the recommendation to take radioprotective drugs will be communicated to emergency workers.

- For institutionalized populations, such as hospital/medical facility patients, OROs should consider provisions for the use of KI by the institutional staff that will care for them. Plans/procedures also identify how recommendations to take radioprotective drugs will be communicated to institutionalized persons.

ORO plan for and maintain an adequate supply for each individual²⁷ in the plume exposure pathway EPZ, which includes identifying quantities, storage locations, and means of distribution in the plans/procedures. OROs document procedures for maintaining a radioprotective drug supply, including acceptable storage conditions, obtaining shelf life extensions, and replacement. Plans/procedures include the forms used for documenting ingestion of radioprotective drugs, as well as information regarding those who have declined the use of KI in advance.

Plans/procedures include a statement that manufacturer's instructions will be provided when administering KI.²⁸ 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 acquiring the KI supply.

REFERENCES

- EPA-400/R-17/001, *PAG Manual: Protective Action Guides and Planning Guidance for Radiological Incidents*, January 2017.
- Federal Register, Vol. 66, No. 13, pp. 5427-5440, *Consideration of Potassium Iodide in Emergency Plans; Final Rule*, Nuclear Regulatory Commission, January 19, 2001.
- Federal Register, Vol. 66, No. 238, pp.64046-64047, *Guidance on Use of Potassium Iodide as a Thyroid Blocking Agent in Radiation Emergencies; Availability*, Food and Drug Administration, December 11, 2001.
- Federal Register, Vol. 67, No. 7, pp.1355-1357, *Federal Policy on Use of Potassium Iodide (KI)*, Federal Emergency Management Agency, January 10, 2002.
- Federal Register, Vol. 69, No. 45, pp.10725-10725, *Guidance for Federal Agencies and State and Local Governments: Potassium Iodide Tablets Shelf Life Extension; Availability*, Food and Drug Administration, March 8, 2004.
- National Research Council of the National Academies, *Distribution and Administration of Potassium Iodide in the Event of a Nuclear Incident*, 2004.

EVALUATION CRITERION J.11.c

Means of evacuation informed by the updated ETEs. The evacuation routes and transportation resources to be utilized are described and include projected traffic capacities of evacuation routes and implementation of traffic control schemes during evacuation.

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

TO MEET THE INTENT OF EVALUATION CRITERION J.11.c, ORO PLANS/PROCEDURES INCLUDE:

- A statement identifying which version of the ETE study the evacuation plan and procedures are based on;
- Means for controlling traffic to assure a safe and efficient evacuation; and
- The resources and equipment necessary to control traffic control.

²⁷ For additional guidance, see National Research Council of the National Academies, *Distribution and Administration of Potassium Iodide in the Event of a Nuclear Incident*, 2004.

²⁸ Manufacturer's patient information is available on the "Drugs@FDA" Approved Drug Products database website at www.accessdata.fda.gov/scripts/cder/drugsatfda/.

EXPLANATION

The plans/procedures identify how the general public within the plume exposure pathway EPZ will be evacuated if necessary. This includes individuals who are capable of using public transportation. The evacuation of individuals who need assistance in an evacuation due to access and functional needs or institutional or other confinement is addressed in evaluation criterion J.11.a. The plans/procedures include measures to promote a smooth flow of evacuation traffic and assist persons who have no means of transportation.

Plans/procedures consider results of the ETE study when selecting evacuation as a protective action. The version of the ETE study that the evacuation plan and procedures are based on is identified. Utilizing the results of the ETE study, consideration is given to how far in advance an evacuation may need to occur. Consideration is also given to the population densities and time estimates for individual evacuation areas. Traffic capacities on the evacuation routes for selected evacuation areas are considered and when applicable, alternative routes are considered and selected. Means for controlling the flow of traffic, including establishing traffic control points (TCPs) along evacuation routes and converting two-way roads to all one-way in order to increase traffic capacity are identified in plans/procedures. Plans/procedures identify personnel and equipment necessary to control traffic flow. In addition, a means for identifying alternative routes and the resources needed to redirect traffic, as necessary, are identified in plans/procedures (e.g., during a HAB incident, OROs may need to use alternate evacuation routes to avoid areas of hostile activity or to facilitate in-bound response).

REFERENCES

- FEMA Comprehensive Preparedness Guide 101, *Developing and Maintaining Emergency Operations Plans*, Version 2.0, November 2010.
- National Incident Management System, Third Edition, October 2017.
- National Response Framework, *Mass Evacuation Incident Annex*, June 2008.
- NUREG/CR-7002/SAND2010-0016P, *Criteria for Development of Evacuation Time Estimate Studies*, November 2011.

EVALUATION CRITERION J.11.d

The locations of pre-identified reception centers beyond the boundaries of the plume exposure pathway EPZ, organizations responsible for managing reception centers, arrangements for handling service animals and pets, and provisions for radiological monitoring/decontamination.

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

TO MEET THE INTENT OF EVALUATION CRITERION J.11.d, ORO PLANS/PROCEDURES INCLUDE:

- i. Locations of all reception centers and host schools for evacuees and students by name and address;
- ii. Organizations responsible for managing reception centers and staffing requirements for each center;
- iii. Provisions and arrangements for the radiological monitoring of evacuees, service animals, pets, and evacuee vehicles;
- iv. Arrangements for managing students at reception centers and/or host schools;
- v. Identified hospitals, correctional facilities, and nursing homes that will receive evacuees; and
- vi. Arrangements for congregate care based on historical need.

EXPLANATION

Plans/procedures identify reception centers in host/support jurisdictions. These centers are located at least 5 miles, preferably 10 miles, beyond the boundaries of the plume exposure pathway EPZ. The plans/procedures provide information on all reception centers, including: name, specific location (e.g., address, city), capacity, accessibility features for persons with access and functional needs, arrangements for handling service animals, and pets the organization(s) managing the centers, and staffing requirements for each center.

Plans/procedures include provisions and describe the process for radiological monitoring of evacuees, service animals, pets, and evacuee vehicles at reception centers, and address any special radiological monitoring considerations. Current FEMA policy indicates that the planning basis for monitoring personnel and equipment is 20 percent of the plume exposure pathway EPZ population assigned to each facility, see evaluation criterion J.13 for additional information.

Plans/procedures identify, if possible, which schools will be directed to which reception centers and/or host schools located beyond the plume exposure pathway EPZ boundary. The plans/procedures describe arrangements for managing 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. Special consideration should be given for the needs of students who reside within the plume exposure pathway EPZ, but who attend school outside the plume exposure pathway EPZ.

The plans/procedures identify any hospitals, correctional facilities, and nursing homes that will receive evacuees.

Some evacuees may need congregate care after arriving at a reception center. 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 will vary, it is prudent to incorporate a planning basis that is flexible and can be modified as the incident warrants.

FEMA developed *Guidance on 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 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

- FEMA, *Guidance on Planning for Integration of Functional Needs Support Services in General Population Shelters*, November 2010.
- Post-Katrina Emergency Management Reform Act of 2006, Pub. L. No. 109-295, §§ 641-654 (2006) (codified as amended at 6 U.S.C. §§ 741-754).

EVALUATION CRITERION J.11.e

Means for the initial and ongoing control of access to evacuated areas and organizational responsibilities for such control, including identifying pre-selected control points.

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

TO MEET THE INTENT OF EVALUATION CRITERION J.11.e, ORO PLANS/PROCEDURES INCLUDE:

- Means for initial and ongoing control of access to evacuated areas;
- Organization(s) responsible for providing access control and staffing TCPs and ACPs;
- Maps identifying pre-selected TCPs/ACPs (may be incorporated by reference);
- Equipment and resources needed (e.g., cones or barricades);
- 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

Plans/procedures identify the various transportation modes (e.g., air, rail, water, and highway) in the plume exposure pathway EPZ and how access control of evacuated areas will be accomplished. The organization(s) responsible for controlling each mode (e.g., organizations controlling road access) and the means for controlling access of each mode (e.g., cones and barricades) are described in the plans/procedures.

Plans/procedures include or reference maps identifying the pre-selected locations of TCPs and ACPs, describe staffing requirements for identified TCPs and ACPs, and identify the roles and responsibilities for TCP and ACP personnel, such as verifying emergency worker identification and authorizing access to the affected areas. The plans/procedures contain information relevant to TCP/ACP setup and implementation, including listing the necessary 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

- FEMA Comprehensive Preparedness Guide 101, *Developing and Maintaining Emergency Operations Plans*, Version 2.0, November 2010.
- National Incident Management System, Third Edition, October 2017.
- National Response Framework, *Mass Evacuation Incident Annex*, June 2008.
- NUREG/CR-7002/SAND2010-0016P, *Criteria for Development of Evacuation Time Estimate Studies*, November 2011.

EVALUATION CRITERION J.11.f

Identification of and means for dealing with potential impediments to the use of evacuation routes (e.g., seasonal impassibility of roads) and contingency measures. The resources available to clear impediments and responsibility for re-routing traffic, as necessary, are described.

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

TO MEET THE INTENT OF EVALUATION CRITERION J.11.f, ORO PLANS/PROCEDURES INCLUDE:

- i. Resources available (e.g., personnel and equipment) to clear impediments to use of evacuation routes and emergency response in areas affected by incidents;
- ii. The potential need to use alternate routes because of traffic impediments, including procedures for implementing alternate evacuation routes; and
- iii. The individual(s), by title/position, responsible for directing resources and rerouting traffic.

EXPLANATION

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. Traffic impediments may include adverse weather conditions, an airborne radioactive plume, areas affected by hostile actions, road construction, or other factors along designated evacuation routes that may hinder a timely, safe evacuation. Where outside resources will be used, the plans/procedures include or reference written agreements, as described in evaluation criterion A.4. The plans/procedures also specify the individual(s), by title/position, responsible for directing such resources and for re-routing traffic as necessary.

When rerouting traffic, the capability of the infrastructure to handle the evacuation should be considered; this includes, but is not limited to, the following considerations: road capacity, weight limits, bridges, overpasses, heights, roadway composition, and any other roadway-specific considerations that may affect the infrastructure's capability to handle the evacuation.

REFERENCES

- FEMA Comprehensive Preparedness Guide 101, *Developing and Maintaining Emergency Operations Plans*, Version 2.0, November 2010.
- National Incident Management System, Third Edition, October 2017.

EVALUATION CRITERION J.11.g

Identification of and means to implement precautionary protective actions (e.g., actions taken at an SAE).

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

TO MEET THE INTENT OF EVALUATION CRITERION J.11.g, ORO PLANS/PROCEDURES INCLUDE:

- Precautionary protective actions that may be taken;
- The ECLs at which a precautionary protective action may be taken; and
- Methods used to implement precautionary protective actions.

EXPLANATION

Precautionary protective actions are preplanned actions taken in advance of a release or at a GE that provide additional levels of protection. These actions can include a number of activities that can be conducted prior to the declaration of a GE when protective actions for the general public are needed. Examples of precautionary protective actions may include early evacuation of schools, licensed day cares, nursing homes, medical/health care facilities, and other identified special facilities. Other precautionary protective actions may include provisions to place animals on stored feed and water prior to an anticipated evacuation order, clearing or closing of waterways, or closing public recreational areas, parks, and beaches.

Plans/procedures identify preplanned precautionary protective actions appropriate for each jurisdiction. For each precautionary protective action identified, the plans/procedures identify the ECL at which the precautionary protective action may be implemented. Implementation methods for all identified precautionary protective actions are described in plans/procedures.

REFERENCES

- FEMA Comprehensive Preparedness Guide 101, *Developing and Maintaining Emergency Operations Plans*, Version 2.0, November 2010.

EVALUATION CRITERION J.12

Protective actions to be used for the ingestion exposure pathway EPZ are specified, including the methods for protecting the public from consumption of contaminated foodstuffs, and are based on current Federal guidance.

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

TO MEET THE INTENT OF EVALUATION CRITERION J.12, ORO PLANS/PROCEDURES INCLUDE:

- The organization and individual(s), by title/position, with the authority to make decisions in the ingestion exposure pathway EPZ;
- Planned ingestion protective actions and the rationale for the selection of actions;
- The methodology used to designate the areas of concern where monitoring and sampling will be implemented;

- iv. The methodology for collecting agricultural samples, including identifying field team members, providing necessary supplies, names and addresses of points of contact to obtain permission to collect samples, and chain of custody procedures;
- v. The analytical laboratory capability to analyze various samples and the procedure for reporting analytical results to the appropriate organization;
- vi. The location and means of obtaining up-to-date information on licensed agribusiness facilities within the ingestion exposure pathway EPZ;
- vii. The ability to obtain information on facilities outside the ingestion exposure pathway EPZ at risk for receiving potentially contaminated products, including names and telephone numbers for points of contact;
- viii. The location and means of obtaining up-to-date information on land use (i.e., which crops are being grown in which areas), including the status of harvesting;
- ix. The DILs that would warrant implementation of protective actions and the rationale and assumptions used to develop the DILs;
- x. The availability of suitable maps, including GIS maps, for recording various data; and
- xi. The means by which the agribusiness will be notified of a PAD that would affect the ability to sell or move foodstuffs or agricultural products.

EXPLANATION

Plans/procedures identify the organization and the individual(s), by title/position, with the authority to make PADs for the ingestion exposure pathway EPZ. The recommendations on incidental radioactive contamination of human food and animal feeds recommend that public health risk be averted by limiting the radiation dose received from eating contaminated foodstuffs.²⁹ 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 human 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 EPZ, there are two categories of PADs: (1) precautionary protective actions and (2) emergency protective actions. Precautionary protective actions are taken to prevent or reduce contamination of milk, foodstuffs, and drinking water. Emergency protective actions are taken to isolate foodstuff to prevent its introduction into commerce and to determine whether condemnation or other disposition is appropriate.

²⁹ For further information, see Federal Register, Vol. 63, No. 156, pp.43402-43403, *Guidance on Accidental Radioactive Contamination of Human Food and Animal Feeds: Recommendations for State and Local Agencies; Availability*, Food and Drug Administration, August 13, 1998.

a. Precautionary Protective Actions

Precautionary protective actions taken prior to confirmation of contamination include:

- Simple precautionary protective actions to avoid or reduce the potential for contamination of human food and animal feeds. These will not guarantee that contamination in human food will be below the DILs, but they should significantly reduce the severity of the problem. Typical precautionary protective actions include covering exposed products, moving animals to shelter, corralling livestock, and providing protected animal feed and water.
- Temporary embargoes to prevent human 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 human food.

Precautionary protective actions can be taken before the release or arrival of contamination if officials have advanced 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 protective actions before declaration of a SAE or GE if predictions of the extent and magnitude of the offsite contamination are persuasive. Precautionary protective actions related to the embargo of unlicensed agricultural products may be addressed in public messages and other informational brochures.

As appropriate, plans/procedures include methods to track human food leaving and limit human food entering the ingestion exposure pathway EPZ. This information includes dairies, human food processing plants, surface water supplies, water intakes, farmers markets, farm stands, nurseries, and other permanent facilities.

b. Determination of Contamination in Human Food

Plans/procedures identify how the levels of contamination in human food will be determined. This includes sampling and analysis capability.

c. Protective Actions for Human Foods Confirmed to be Contaminated

Protective actions when the contamination in human food equals or exceeds the DILs include:

- Temporary embargoes to prevent contaminated human 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 human food production and processing actions that reduce the amount of contamination in or on human 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 human food leaving and limit human food entering the ingestion exposure pathway 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 for contaminated animal feeds include:

- Substituting uncontaminated water for contaminated water.
- Removing lactating dairy animals and meat animals from contaminated animal feeds and pasture.
- Substituting uncontaminated animal feed for those which are contaminated.

Putting dairy animals on stored animal 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

Plans/procedures describe the rationale for selecting the sampling areas. Plans/procedures describe resources for collecting human food and agricultural product samples in the areas of concern, including use of chain-of-custody documentation. 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 human 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. 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. Additionally, plans/procedures make provisions for recording land use information, such as the location of agribusiness activities (e.g., dairies, human food processing plants, surface water supplies, water supply intakes, and other permanent activities). Processing plants that are located within the ingestion exposure pathway EPZ are identified. Plans/procedures further delineate those plants that receive potentially contaminated products from inside the ingestion exposure pathway EPZ and those that receive products from outside of the ingestion exposure pathway 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

Plans/procedures specify the organization and individual, by title/position, 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 human food or agricultural products and describe the process to prevent the sale or movement of products of concern.

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, measured concentrations of specific radionuclides in human foods in lieu of the PAGs. In order to characterize the extent of the problem, many laboratory analyses may be needed. The plans/procedures specify the actions that will be taken prior to the determination of the actual levels of contamination in the human food produced in the impacted area.

REFERENCES

- EPA-400/R-17/001, PAG Manual: Protective Action Guides and Planning Guidance for Radiological Incidents, January 2017.
- Federal Register, Vol. 63, No. 156, pp.43402-43403, Guidance on Accidental Radioactive Contamination of Human Food and Animal Feeds: Recommendations for State and Local Agencies; Availability, Food and Drug Administration, August 13, 1998.
- NUREG-1442/FEMA-REP-17, Rev. 1, Emergency Response Resources Guide for Nuclear Power Plant Emergencies, July 1992.

EVALUATION CRITERION J.13

The means for registering, monitoring, and decontaminating evacuees, service animals, pets, vehicles, and possessions at reception centers in host areas are described. The personnel and equipment available are capable of monitoring 20 percent of the plume exposure pathway EPZ population, including transients, assigned to each facility within a 12-hour period.

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

TO MEET THE INTENT OF EVALUATION CRITERION J.13, ORO PLANS/PROCEDURES INCLUDE:

- i. The radiological capabilities to monitor evacuees, service animals, pets, vehicles, and possessions;
- ii. Decontamination procedures, including the triggers/action levels³⁰ that indicate the need for decontamination activities and procedures for medical attention referral;
- iii. Contamination control measures, such as safety requirements, decontamination site layout, and decontamination protocol;
- iv. 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, service animals, and pets; and
- v. The processes for registering evacuees, service animals, and pets in host/support jurisdictions, including documentation of monitoring for referral to temporary care facilities.

EXPLANATION

a. Monitoring

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 plume exposure pathway EPZ population (including transients) at reception centers in host/support jurisdictions within a 12-hour period. The 20 percent planning basis does not include re-monitoring of persons who have been decontaminated; re-monitoring is conducted within approximately a 12-hour period.

“Total plume exposure pathway EPZ population” includes residents, an 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 center. The FEMA guidance document, FEMA-REP-22, *Contamination Monitoring Guidance for Portable Instruments Used for Radiological Emergency Response to Nuclear Power Plant Accidents* specifies the time it takes to monitor an individual, vehicle, 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

³⁰ “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.”

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 $\mu\text{Ci}/\text{cm}^2$ 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 need to be monitored by hand.

The plans/procedures indicate the triggers/action levels requiring decontamination. 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 access and functional needs and pets 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 maintain a list or other record of all persons, vehicles, service animals, and pets monitored, and whether contamination was detected. Forms are typically used for recording monitoring results and are included in the plans/procedures.

b. Decontamination

Quality health physics practices and the philosophy of as low as reasonably achievable (ALARA) indicate that the plans/procedures provide for decontamination of individuals, vehicles, service animals, and pets found to be contaminated during the monitoring process. Currently, there is no federal guidance that provides information on decontaminating animals. However, plans/procedures need to describe the means for decontaminating service animals and pets, as defined in this document. FEMA does not intend to evaluate the demonstration of the decontamination of service animals and pets, but will evaluate that plans/procedures describe the means for decontaminating service animals and pets, as directed by evaluation criterion J.13, through the plan review process. Further information on the plan review process can be found in Part IV, Section J.

Decontamination capabilities available at a reception center include, at a minimum, sinks and showers with soap and water, and a change 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. 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 were unable to 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.

c. Contamination Control

The plans/procedures describe contamination control methods (e.g., proper floor coverings, personal protective equipment (PPE) worn by trained emergency personnel, etc.). Plans/procedures outline 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, service animals, and pets that have been

monitored and found to be uncontaminated are kept separate from those individuals, vehicles, service animals, and pets that have yet to be monitored or are contaminated. Individuals, service animals, pets, and vehicles exiting the monitoring and decontamination area are provided with an indication (e.g., hand stamp, sticker, bracelet, form, etc.) that they, their service animals, pets, and/or vehicles 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 require confirmation that their vehicle is free from contamination or that it 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, etc.) at reception centers, as well as the location where the waste will be initially stored and how the storage areas will be marked and secured. The plans/procedures outline facilities for handling evacuees' service animals, pets, contaminated vehicles, and possessions, including storage, security, and owner identification. Waste water from decontamination operations does not need to be collected.

d. Registration

Plans/procedures identify the means for registering evacuees and their service animals and pets. Forms or electronic means (e.g., computer, audio, video, etc.) may be used. Registration forms include name, address, family members, and time of arrival at the facility. If ARC 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

- EPA-400/R-17/001, PAG Manual: Protective Action Guides and Planning Guidance for Radiological Incidents, January 2017.
- 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 Response Framework, Mass Evacuation Incident Annex, June 2008.
- Nuclear/Radiological Incident Annex to the Response and Recovery Federal Interagency Operational Plans, October 2016.
- Post-Katrina Emergency Management Reform Act of 2006, Pub. L. No. 109-295, §§ 641-654 (2006) (codified as amended at 6 U.S.C. §§ 741-754).

NUREG CRITERION J.14

General plans for the removal or continued exclusion of individuals from restricted areas are developed. Relocation plans include:

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

TO MEET THE INTENT OF EVALUATION CRITERION J.14, ORO PLANS/PROCEDURES INCLUDE:

- i. General plans for the removal or continued exclusion of individuals from restricted areas; and
- ii. Relocation plans are developed when the decision for removal or continued exclusion of individuals from restricted areas.

EXPLANATION

The general plans for the removal or continued exclusion of individuals from restricted areas will be developed for the intermediate phase, defined as the period beginning after the source and releases have been brought under control and environmental measurements are available for use as a basis for decisions on protective actions and extending until these protective actions are terminated. This phase may last from weeks to months but is projected for one year for calculation purposes.

In contrast to the early phase, where decisions must be made and implemented quickly, many decisions and actions during the intermediate phase may be taken after federal resources are present, as described in the Nuclear/Radiological Incident Annex (NRIA). The focus of decisions made during this phase are on whether particular areas or properties from which people have been evacuated will be decontaminated and reoccupied or if the occupants will be relocated for an extended period.

The intermediate phase PAGs and corresponding protective actions are used by state and local officials when developing plans to protect the public from exposure to radiation from deposited radioactive materials.

If circumstances exist that prevent an area from being returned to acceptable levels of radiation, it is necessary to relocate individuals – either temporarily or permanently – from that area to prevent chronic radiation exposure that may impact the health and safety of the public living in that area. 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. The creation of relocation plans is further detailed in the J.14 sub-criteria.

REFERENCES

- EPA-400/R-17/001, *PAG Manual: Protective Action Guides and Planning Guidance for Radiological Incidents*, January 2017.

EVALUATION CRITERION J.14.a***Process for implementing current Federal guidance for relocation.***

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

TO MEET THE INTENT OF EVALUATION CRITERION J.14.a, ORO PLANS/PROCEDURES INCLUDE:

- i. Organization(s) with the responsibility for making decisions on relocation;
- ii. The rationale used to determine areas for relocation; and
- iii. The process for notifying individuals who are being relocated.

EXPLANATION

Plans/procedures describe the rationale behind the relocation decision(s), which are made based on environmental monitoring and laboratory analysis of radiological contamination in the area(s), and the ability to remove or reduce radioactive contamination to safe levels of exposure. Plans take into consideration the coordination among OROs regarding the implementation of relocation.

Plans/procedures identify a process for notifying individuals of the decision to relocate, including a reassessment of the area to determine if/when the public can safely return. Provisions for transportation-dependent individuals in relocation areas that were not previously evacuated are considered in plans and procedures. Provisions also are made to monitor and decontaminate individuals in relocation areas that were not previously evacuated.

In the case that permanent relocation is necessary, a long-term relocation plan is developed. This includes planning for critical services such as schools, electricity, water, sewer, and care of domestic and farm animals in the relocation area. Plans

and procedures identify assistance available to relocate individuals, including the organization(s) responsible for providing such assistance.

REFERENCES

- EPA-400/R-17/001, PAG Manual: Protective Action Guides and Planning Guidance for Radiological Incidents, January 2017.

EVALUATION CRITERION J.14.b

Means to identify and determine the boundaries of relocation areas, including a buffer zone.

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

TO MEET THE INTENT OF EVALUATION CRITERION J.14.b, ORO PLANS/PROCEDURES INCLUDE:

- The process used to identify areas where the projected first-year dose will exceed the 2 rem relocation PAG; and
- The process for identifying the need for buffer zones, as well as their establishment when warranted.

EXPLANATION

The PAGs for relocation are intended for use in establishing the boundary of a relocation area within an area where radioactive materials have been deposited. OROs plans and procedures describe the process for monitoring and assessing the radioactive contamination levels of relocation areas. The process to compare results of monitoring and assessment to current PAGs is identified and a method to identify relocation areas are described.

Buffer zones are identified around relocation areas when there is a possibility that particles from high deposition areas could drift into the occupied areas. The buffer zones should be established to restrict residential use until radiological measurements and assessment confirm that it is no longer necessary. The buffer zones should be set with the understanding that conservatism is inherent in the PAGs.

Coordination should occur among responsible OROs when identifying appropriate boundaries, control points, and buffer zones if needed. Areas identified for temporary or permanent relocation will need to be secured and access is controlled, this process is further described in evaluation criterion J.14.d.

It may be necessary to allow reentry to relocation areas. Further planning guidance for temporary reentry is described in evaluation criterion M.1.b.

REFERENCES

- EPA-400/R-17/001, PAG Manual: Protective Action Guides and Planning Guidance for Radiological Incidents, January 2017.

EVALUATION CRITERION J.14.c

Prioritization of relocation based on projected dose to an individual and the timeframe for relocation.

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

TO MEET THE INTENT OF EVALUATION CRITERION J.14.c, ORO PLANS/PROCEDURES INCLUDE:

- Priorities for relocation; and
- Designation of intervals to continually assess projected doses from the relocation areas.

EXPLANATION

Setting priorities for relocation is important as, in most cases, the protective actions during the intermediate phase will be carried out over a relatively long period of time. These priorities will be important given the size of the affected area and that it may be impractical to relocate members of the public from areas that barely exceed the relocation PAGs. The following priorities are appropriate:

- First, protect all people from doses that could cause acute health effects from all exposure pathways, including previous exposure to the plume.
- Conduct radiological surveys to verify or adjust estimates of radiological impacts, including the designation of intervals to continually assess projected doses from the relocation areas.
- Recommend that affected people reduce their exposures by using simple decontamination techniques and remaining indoors.

The high-priority decisions on whether to relocate people from high exposure rate areas must have exposure rate measurements and dose analyses. Monitoring and dose assessment will be an ongoing and continual process, completed at specified intervals, with priority given to the areas with the highest exposure rates.

REFERENCES

- EPA-400/R-17/001, *PAG Manual: Protective Action Guides and Planning Guidance for Radiological Incidents*, January 2017.

EVALUATION CRITERION J.14.d***Control of access to and egress from relocation areas and security provisions for evacuated areas.***

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

TO MEET THE INTENT OF EVALUATION CRITERION J.14.d, ORO PLANS/PROCEDURES INCLUDE:

- i. Establishment of access control/check points around the relocation area;
- ii. Processes for identifying those who are authorized to enter relocation areas;
- iii. Methods to provide exposure and contamination control to those authorized to enter relocation areas; and
- iv. Establishment of monitoring and decontamination stations at points of egress in the buffer zone around relocation areas.

EXPLANATION

Access control/check points are established to ensure only authorized individuals are allowed entry to the relocation area. A credentialing/authorization system is established. Missions inside the relocation area are verified, as is proper contamination and exposure control protocols. Provisions for monitoring and decontamination of those exiting the relocation area are described in plans and procedures.

Plans include provisions for resources and manpower to secure and control access to relocation areas. Provisions include resources, supplies and radiation protective equipment for workers manning access points.

Additional guidance for temporary reentry can be found in evaluation criteria M.1 and M.1.b.

REFERENCES

- EPA-400/R-17/001, *PAG Manual: Protective Action Guides and Planning Guidance for Radiological Incidents*, January 2017.

EVALUATION CRITERION J.14.e

Contamination control during relocation.

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

TO MEET THE INTENT OF EVALUATION CRITERION J.14.e, ORO PLANS/PROCEDURES INCLUDE:

- i. Methods for monitoring and decontamination of individuals who are being relocated from areas not previously evacuated.

EXPLANATION

It may be necessary to provide monitoring and decontamination services to populations identified to be in a relocation area that were not previously evacuated. Reception centers already identified for use during the emergency phase of an incident may be used. It may be more appropriate to use monitoring and decontamination stations set up in the buffer zone if they are already established. Using monitoring and decontamination stations inside the buffer zone around the relocation area has the benefit of reducing the potential for spread of contamination. Resources are identified to support continued use of reception centers or monitoring and decontamination stations established in the buffer zone and are consistent with those planned for at a reception center or emergency worker monitoring and decontamination station.

Additional guidance considerations for contamination control can be found in evaluation criterion M.1.b.

REFERENCES

- EPA-400/R-17/001, *PAG Manual: Protective Action Guides and Planning Guidance for Radiological Incidents*, January 2017.

EVALUATION CRITERION J.14.f

Means for coordinating and providing assistance during relocation.

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

TO MEET THE INTENT OF EVALUATION CRITERION J.14.f, ORO PLANS/PROCEDURES INCLUDE:

- i. Physical and economic assistance for those who are relocated; and
- ii. Provisions for physical, economic, and financial assistance of individuals being relocated.

EXPLANATION

It will be necessary to plan for and provide assistance to those who must be relocated. Plans and procedures identify appropriate local, state, and federal resources to assist individuals who are being relocated. Plans also identify the means to connect relocated individuals with appropriate agencies to meet their needs for assistance.

REFERENCES

- *National Incident Management System*, Third Edition, October 2017.

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.

EVALUATION CRITERION K.1

The radiation protection controls for emergency workers to be implemented during emergencies are described. These controls address the following aspects:

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

EVALUATION CRITERION K.1.a

Onsite emergency exposure guidelines for emergency workers consistent with their assigned duties and current Federal guidance and the conditions under which the guidelines apply.

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

EVALUATION CRITERION K.1.b

The capability to evaluate emergency worker dose (i.e., the sum of the effective dose equivalent and the committed effective dose equivalent) at the time of exposure when direct measurement is not feasible.

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

EVALUATION CRITERION K.1.c

The capability to monitor and assess the radiation doses received by emergency workers for the duration of the incident.

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

EVALUATION CRITERION K.1.d

The capability to implement onsite contamination control measures.

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

EVALUATION CRITERION K.1.e

The capability to decontaminate emergency workers, equipment, and vehicles.

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

EVALUATION CRITERION K.1.f

Appropriate radiation protection briefings for repair teams that are being dispatched into the plant and FMTs being sent onsite and offsite, the scope of which is consistent with the expected risk to the team.

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

EVALUATION CRITERION K.1.g

The process for NPP site access and dosimetry issuance to personnel from OROs arriving to assist with the onsite response.

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

EVALUATION CRITERION K.2

Individual(s) that can authorize personnel to receive radiation doses in excess of the occupational dose limits in accordance with the minimum standards set forth in 10 CFR Part 20 or 29 CFR 1910.1096, as applicable to the organization, are identified by title/position. Such authorizations are documented.

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

TO MEET THE INTENT OF EVALUATION CRITERION K.2, ORO PLANS/PROCEDURES INCLUDE:

- i. (Or reference) The occupational dose limits in accordance with the regulation applicable to their organization;
- ii. The individual(s), by title/position, who can authorize radiation doses in excess of occupational limits; and
- iii. Processes for authorizing and documenting personnel to exceed occupational dose limits.

EXPLANATION

The NRC's 10 CFR Part 20 (Standards for Protection against Radiation) and the OSHA 29 CFR 1910.1096 (Toxic and Hazardous Substances-Ionizing Radiation) describe their respective agency's dose limits an individual may incur during normal, non-emergency conditions. The purpose of 10 CFR Part 20 is to control the receipt, possession, use, transfer, and disposal of licensed material by any licensee in such a manner that the total dose to an individual (including doses resulting from licensed and unlicensed radioactive material and from radiation sources other than background radiation) does not exceed the standards for protection against radiation as described in the regulation. However, limits are not to be construed as limiting actions that may be necessary to protect health and safety. 29 CFR 1910.1096 describes OSHA's radiation exposure safety and dose limit standards in the workplace. Plans and procedures include or reference the appropriate occupational dose limits in accordance with the regulation applicable to their organization.

Plans/procedures identify individual(s), by title/position, for personnel to contact when seeking authorization to receive a dose above occupational limits. Plans/procedures include processes for authorizing personnel to exceed occupational dose limits, including proper documentation of such authorizations.

As required by regulation applicable to their organizations, plans/procedures consider occupational radiation dose accumulated under non-emergency conditions before assigning additional response and/or recovery activities to mitigate further health risks.

REFERENCES

- 10 CFR Part 20, *Standards for Protection Against Radiation*.
- 29 CFR 1910.1096, *Ionizing Radiation*.
- EPA-400/R-17/001, *PAG Manual: Protective Action Guides and Planning Guidance for Radiological Incidents*, January 2017.

EVALUATION CRITERION K.2.a

The process for allowing onsite volunteers to receive radiation exposures in the course of carrying out lifesaving and other emergency activities is described.

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

EVALUATION CRITERION K.2.b

The process for authorizing emergency workers to incur exposures that may result in doses in excess of the current Federal guidance is described.

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

TO MEET THE INTENT OF EVALUATION CRITERION K.2.b, ORO PLANS/PROCEDURES INCLUDE:

- i. Emergency worker dose limits;
- ii. Process for when emergency worker dose limits are reached and subsequently exceeded;
- iii. Authorization and documentation processes for authorizing emergency workers to exceed dose limits, including exceeding limits identified in current Federal guidance;
- iv. Briefing and documentation processes for communicating risks involved for incurring excessive dose; and
- v. Any special conditions requiring additional limitations.

EXPLANATION

Most incidents, even lifesaving operations, can be managed within established dose limits through exposure mitigating measures and practices (e.g., use of KI, where appropriate; limiting time spent working in radiation areas; rotating available emergency workers³¹). Emergency workers may or may not be individuals normally exposed to ionizing radiation as a part of their occupations; furthermore, state and local authorities designate what categories of their workers are classified as emergency workers. OROs make every effort to keep emergency worker exposures ALARA. However, there may be instances where emergency workers may be at risk of incurring radiation exposure beyond the EPA PAG Manual recommended dose limits for emergency workers. Plans/procedures emphasize excess exposures are undertaken only if absolutely necessary, and as authorized and controlled by authorized personnel.

The EPA PAG Manual provides OROs guidance on emergency worker exposure control and exposure guidelines to support decision-making. Plans/procedures include or reference the dose limits for emergency worker exposures found in the EPA PAG Manual and address the assignment of these limits for emergency work.

Plans/procedures reference or include the process for authorizing and documenting emergency workers volunteering to receive doses in excess of the specified dose limits described in the plans/procedures, including providing a description of the full reporting and decision chain process (i.e., from the emergency worker requesting and obtaining authorization to communicating back to the emergency worker with the final decision). Plans/procedures also include the briefing and documentation processes for communicating radiation and health risks involved for exceeding dose limits, including providing the source of information used to brief volunteers.

³¹ An emergency worker is an individual not normally exposed to ionizing radiation as part of their occupation that may be exposed in excess of occupational dose limits while performing actions to mitigate the consequences of a radiological incident for human health and safety, quality of life, property, and the environment. State and local authorities designate what categories of workers are classified as emergency workers. Emergency workers may include law enforcement personnel, firefighters, health services personnel, and animal care specialists.

Special conditions requiring additional limitations or exceptions are addressed in plans and procedures (e.g., declared pregnancies or minors). 10 CFR Part 20 – specifically Parts 20.1206, 20.2105, and 20.2204 – provides additional information on planned special exposures.

REFERENCES

- EPA-400/R-17/001, PAG Manual: Protective Action Guides and Planning Guidance for Radiological Incidents, January 2017.
- FEMA-REP-2, Rev. 2, Guidance on Offsite Emergency Radiation Measurement Systems, Phase 1 – Airborne Release, June 1990.
- National Incident Management System, Third Edition, October 2017.
- Nuclear/Radiological Incident Annex to the Response and Recovery Federal Interagency, Operational Plans, October 2016.

EVALUATION CRITERION K.3

The capability to determine the doses received by emergency workers involved in any commercial NPP radiological incident is described. Each organization makes provisions for distribution of direct-reading dosimeters (DRDs) and permanent record dosimeters (PRDs).

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

TO MEET THE INTENT OF EVALUATION CRITERION K.3, ORO PLANS/PROCEDURES INCLUDE:

- Types and quantities of dosimeters (and dosimeter chargers, when applicable) available per location and the number of emergency workers requiring dosimetry devices;
- Dosimetry storage locations;
- Process for distributing dosimeters to all emergency workers;
- Exposure control methods for emergency workers, including exposure from inhalation;
- Process for reading DRDs and any early reading of PRDs; and
- Specific dosimetry instructions, including record keeping of dosimeter readings and return of dosimeters.

EXPLANATION

Plans/procedures include provisions for maintaining 24-hour capabilities to determine incurred radiation doses to any emergency worker potentially exposed to radiation (i.e., dosimetry) and employ exposure control methods to minimize an emergency worker's TED, also known as whole body dose.

a. Dosimeters

Dosimeters are instruments for measuring external radiation exposure. They do not measure internal committed effective dose from inhaled or ingested radioactive materials. Dosimeters are available in two basic types: DRDs and PRDs. Plans/procedures describe the type and quantity of dosimeters available per storage location and how they are to be administered to emergency workers at risk to radiation exposure. The selected dosimeter will provide an accurate record of the radiation exposure received by the emergency worker over the duration of the incident.

- **DRDs.** DRDs are small ionization detection instruments that indicate radiation exposure directly and can be read in real time by the user. Also referred to as a “pocket dosimeter.” Two major types of DRDs are acceptable for use in emergency response: (1) the ion chamber electroscope and (2) the electronic dosimeter with a visual 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. Ion chamber electroscopes must be checked for charge leakage and may be affected by shock, such as that which would happen from being dropped. 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.

- **PRDs.** PRDs are devices designed to be worn by a single individual for the assessment of radiation dose from external sources of radiation and evaluated by a processor accredited by the National Voluntary Laboratory Accreditation Program (NVLAP) or other accreditation program in accordance with ANSI N13.11-2009, *Personal Dosimetry Performance Criteria for Testing*. There are different types of PRDs, including, but not limited to, the OSLD and the TLD. 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.

Issuing the Right Dosimetry

A mathematical correction factor is used to translate DRD readings in units of roentgen (R) into applicable dose limits in units of rem. OROs should ensure emergency workers have the appropriate dosimeters to read administrative, reporting, and turn-back limit doses, as designated in their emergency response plans.

Example: For severe core degradation, the plume may contain enough particulates and iodine to yield a correction factor of 10 or more rem per R. If the emergency worker dose limit is 5 rem, a 0-20R dosimeter cannot distinguish the exposure limit. If the plume is pure noble gas and the correction factor is 1 rem per R, a 0-200 mR dosimeter cannot read 5000 mR.

Dosimeters measure external exposure to gamma radiation, but do not measure dose from inhaled airborne radioactive material, thus omitting a major portion of the TED. Dose to the thyroid from uptake of radioiodine is mitigated by the correct and timely administration of KI. Although inhalation dose of particulate materials can be controlled by properly fitted respirators, respirators are not generally practical for radiological incident response. OROs commonly utilize DRDs and establish appropriate correction factors to account for the inhalation portion of the incurred dose during the early phase.

When plume data becomes available to dose assessors through modeling and field sampling data, supervisors, radiation safety officers, and decision-makers should use the calculated correction factor to determine emergency worker dose and set exposure limits. Assessment of the actual dose received by emergency workers will continue after the incident is over. 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.

EPA PAG Manual background documentation suggests a correction factor of 5 as a starting point when KI is administered. Dose assessors must characterize the composition of the plume to develop the correction factor appropriate for each incident. The DRDs provided to emergency workers must be capable of reading R in the range corresponding to administrative limits and incident specific calculated limits.

While using ion chamber electrosopes, 1 dosimeter is acceptable and meets the minimum criteria. However, 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. Life-saving missions are likely to arise without warning; in such cases, there is typically little time to issue additional dosimetry, so the use of both high-range and low-range DRDs is recommended.

Emergency workers with assignments outside the plume exposure pathway EPZ who might come into contact with radioactive materials must have PRDs. Because there is little chance of inhalation exposure by these individuals, a correction factor to convert R as read by the DRDs to rem 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 permitted for emergency workers assigned to locations within close enough proximity to the area DRD to reasonably account for emergency worker exposure. Group dosimetry is also permitted for emergency workers assigned to a fixed nuclear facility inside the plume exposure pathway EPZ; however, if emergency workers are deployed outside the building, including moving to an alternate facility, they must be issued a DRD.

b. Quantities of Dosimeters

Plans/procedures indicate the quantities of dosimeters available for emergency worker use. Each emergency worker must carry a PRD. Emergency workers with assignments in the plume exposure pathway EPZ must also carry DRDs. The state determines whether DRDs are required for emergency workers and/or teams with assignments outside of the plume exposure pathway 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, etc.). 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. The plans/procedures address how the OROs will overcome possible shortages during an incident.

c. Distribution of Dosimetry

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.

d. Dose Limits and Exposure Control Options

Agreed upon dose limits for emergency workers are provided in plans/procedures, as provided in the latest EPA PAG Manual, or other appropriate guidance. The following three options for exposure 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. After the evacuation of the general public is complete, emergency workers entering the plume exposure pathway EPZ will be assigned a predetermined administrative dose limit, stated in terms of external radiation dose only that is lower than the maximum TED dose recommended by the EPA for the class of emergency response activity to be performed. The TED 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 TED. 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 TED to emergency workers entering the plume exposure pathway EPZ 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 TED to an emergency worker is unlikely to exceed the applicable limit. The TED 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 TED 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 TED is unlikely to

exceed the limit. For example, if the external dose measured by a DRD is limited to 5 R, the TED is unlikely to exceed 25 rem. Once dose assessors characterize the plume by modeling and by field sampling, an incident specific exposure to TED correction factor should be calculated and used to establish updated administrative exposure limits. If emergency workers have ingested KI, committed effective dose contribution from inhaled radioiodines may be omitted, but the particulate committed effective dose contribution should be included in the calculation.

- **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 TED to emergency workers below the maximum dose recommended for the various classes of activity. The TED 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 exposure limits could remain the same throughout an incident, 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 TED. OROs do not need to undertake such retrospective analyses; instead they may rely on those conducted by licensees and Federal agencies. PRDs could provide the external dose component; OROs should keep records on the time history of exposure.

e. Record Keeping and Return

OROs keep a record listing of the persons to whom both PRDs and DRDs are assigned. Emergency workers keep their assigned PRDs throughout the incident response, unless their lead organization requests them earlier. 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.

f. Considerations for HAB incidents

Under REP scenarios, the number of responders requiring dosimetry and KI – and the levels of radiation to which they may be exposed – has been fairly predictable. In a 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 a 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 a 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 a 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 a 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 for consistency in worker exposure limits and processes during equipment distribution and use.

REFERENCES

- ANSI N13.11-2009, *Personal Dosimetry Performance Criteria for Testing*, March 12, 2015.
- EPA-400/R-17/001, *PAG Manual: Protective Action Guides and Planning Guidance for Radiological Incidents*, January 2017.
- FEMA-REP-2, Rev. 2, *Guidance on Offsite Emergency Radiation Measurement Systems, Phase 1 – Airborne Release*, June 1990.
- Nuclear Regulatory Commission, *NRC Regulatory Issue Summary 2002-21, National Guard and Other Emergency Responders Located in the Licensee’s Controlled Area*, November 8, 2002.

EVALUATION CRITERION K.3.a

Provisions to ensure that DRDs are read at designated intervals and dose records are maintained for emergency workers are described.

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

TO MEET THE INTENT OF EVALUATION CRITERION K.3.a, ORO PLANS/PROCEDURES INCLUDE:

- i. Designated time intervals for reading DRDs;
- ii. The method for emergency workers to record and report DRD readings;
- iii. The methods for obtaining and recording dose readings from emergency workers;
- iv. The method for maintaining dose records for emergency workers; and
- v. Appropriate reporting if administrative limits have been reached or exceeded.

EXPLANATION

Plans/procedures describe the designated time intervals for emergency workers to read and record their DRD dose readings. The time interval can change as the incident progresses, based on radiological conditions. All emergency workers record each reading and note any exposure (including no exposure) on a record card or form provided with the DRDs.

Plans/procedures describe how emergency workers will be informed of the requirement to read, record, and report DRD readings. Typically, when a specified exposure has occurred, the emergency worker informs the radiological health officer or other supervisor, particularly if the administrative limits for the mission have been reached or exceeded (refer to

evaluation criterion K.2.b for additional information). 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. 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.

REFERENCES

- EPA-400/R-17/001, PAG Manual: Protective Action Guides and Planning Guidance for Radiological Incidents, January 2017.
- FEMA-REP-2, Rev. 2, Guidance on Offsite Emergency Radiation Measurement Systems, Phase 1 – Airborne Release, June 1990.
- National Incident Management System, Third Edition, October 2017.
- Nuclear/Radiological Incident Annex to the Response and Recovery Federal Interagency Operational Plans, October 2016.

EVALUATION CRITERION K.4

Action levels for determining the need for decontamination are specified and the means for radiological decontamination are established for emergency workers and the general public, as well as equipment, vehicles, and personal possessions. The means for disposal of contaminated waste created by decontamination efforts are also established.

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

TO MEET THE INTENT OF EVALUATION CRITERION K.4, ORO PLANS/PROCEDURES INCLUDE:

- i. A description of facilities for monitoring and decontaminating emergency workers, equipment, and vehicles;
- ii. A description of facilities for monitoring and decontaminating general public, personal possessions, and vehicles;
- iii. Locations of monitoring and decontamination facilities (facilities for the public should be located outside the plume EPZ);
- iv. Number of people needed to perform monitoring and decontamination operations;
- v. Survey instruments (i.e., specific appropriate equipment and sensitivity, including radiation type) used to monitor emergency workers, equipment, and vehicles;
- vi. Other supplies and equipment needed for monitoring and decontamination;
- vii. Methods for controlling the spread of contamination at the emergency worker and general public monitoring facilities;
- viii. The process for handling contaminated waste collection, handling, and storage;
- ix. Radioactive contamination levels that will trigger decontamination procedures, expressed in applicable units;
- x. The process for re-monitoring individuals, equipment, vehicles, and personal possessions, and recording the results; and
- xi. Criteria for sending individuals with fixed contamination for medical attention.

EXPLANATION

Since emergency workers and the general public may become contaminated with radioactive materials during an incident, plans/procedures describe the capability to activate and operate facilities for monitoring and decontaminating the general public, emergency workers, possessions, equipment, and vehicles.

Plans/procedures describe the facilities and its capabilities for monitoring and decontamination, including facility locations, available trained staff, and other pertinent operation and implementing procedures (e.g., monitoring, contamination control, detected contamination, decontamination procedures) to minimize the spread of contamination and harmful health risks.

a. Monitoring and Decontamination Facility Locations

Plans/procedures indicate the location of monitoring and decontamination facilities for emergency workers and the general public. Facilities for decontamination of emergency workers and their equipment may be either co-located or located separately from decontamination facilities for the general public, and are located outside the plume and/or ingestion pathway EPZ. Facilities contain the necessary equipment and supplies for monitoring and decontaminating individuals and possessions, as well as an open area for monitoring and decontaminating vehicles and equipment. Facilities include showers and have sufficient parking space to separate contaminated and decontaminated or 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.

b. Monitoring Procedures

Monitoring procedures and survey 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 (before the individual, emergency worker, possessions, equipment and vehicles can be released).

Plans/procedures describe the procedures for monitoring individuals 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.³²

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.

For additional information on total population monitoring, please see evaluation criterion J.13.

c. Monitoring Vehicles and Equipment

In addition to monitoring emergency workers and the general public, plans/procedures address monitoring 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 specify trigger/action levels for decontamination. 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 exposure pathway 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 $\mu\text{Ci}/\text{cm}^2$ 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

³² For further guidance, see FEMA-REP-22, *Contamination Monitoring Guidance for Portable Instruments Used for Radiological Emergency Response to Nuclear Power Plant Accidents*, October 2002.

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.

d. Monitoring Equipment

Monitoring procedures include the types of available monitoring equipment, how operational checks will be conducted, and how people and equipment will be monitored. OROs conduct operational checks on monitoring equipment according to the procedures and guidance under evaluation criteria H.11 and H.11.b. For a hand-held monitor with a probe, these 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.

e. Contamination Control Procedures

The plans/procedures describe contamination control procedures and methods (e.g. floor coverings, PPE worn by emergency workers, instructional signs) for each facility, including the means for separating contaminated individuals from those who have not been monitored or from those found to be uncontaminated.

f. Detected Contamination Procedures

Plans/procedures describe a process for recording contamination of emergency workers and the general public, as well as procedures for isolating contaminated vehicles, equipment, and personal possessions, if necessary. Plans/procedures describe the process for collecting, handling, and storing contaminated waste, which may include clothing, equipment, decontamination supplies, etc. (OROs do not need to collect waste water from decontamination operations). This process may include: (1) the individual, by title/position, responsible for disposing of or storing contaminated waste, including both initial and intermediate storage, (2) procedures to avoid raising the background gamma exposure rate significantly in the monitoring area; (3) location for initial and intermediate waste storage; (4) security measures to protect mishandling of waste, (5) demarcation and security for storage areas; and (6) means for disposal and/or long-term storage.

g. Decontamination Procedures

Plans/procedures include the decision criteria for prompting decontamination of the general public, emergency workers, equipment, and vehicles. Instruments used for determining contamination levels are usually count rate meters employing G-M detectors, the decision criterion is typically given in counts per minute (cpm). The plans/procedures specify trigger/action levels, although they may change depending on the detection instruments used.

Plans/procedures describe decontamination procedures for emergency workers, the general public, equipment, possessions, and vehicles. Generally, decontamination supplies available at the emergency worker decontamination center(s) or general public decontamination center(s) 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 HEPA 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 to greasy or waxed surfaces.

The plans/procedures provide for 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.

REFERENCES

- EPA-400/R-17/001, PAG Manual: Protective Action Guides and Planning Guidance for Radiological Incidents, January 2017.
- FEMA Policy Statement, Policy Statement on Disposal of Waste Water and Contaminated Products from Decontamination Activities, January 1989.
- 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, Third Edition, October 2017.
- Nuclear/Radiological Incident Annex to the Response and Recovery Federal Interagency Operational Plans, October 2016.

Planning Standard L – Medical and Public Health Support

Arrangements are made for medical services for contaminated injured individuals.

EVALUATION CRITERION L.1

Arrangements are established with primary and backup hospitals (one hospital is located outside the plume exposure pathway EPZ) and medical services. These facilities have the capability for evaluation of radiation exposure and uptake. The persons providing these services are adequately trained and prepared to handle contaminated, injured emergency workers and members of the general public.

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

TO MEET THE INTENT OF EVALUATION CRITERION L.1, ORO PLANS/PROCEDURES INCLUDE:

- i. A list of primary and backup hospitals/medical facilities to treat potentially contaminated, injured, and/or exposed individuals;
- ii. Individual facility capabilities to evaluate radiation exposure and uptake, including the number of radiologically trained medical personnel and support staff;
- iii. A description of hospital/medical facility and support service capabilities to treat potentially contaminated, injured, and/or exposed individuals; and
- iv. A description of dosimetry procedures, including record-keeping and final receipt for processing.

EXPLANATION

This evaluation criterion refers to arranging medical care for the general public and emergency workers; medical care for members of the licensee staff is addressed in evaluation criterion L.2.

Plans/procedures identify one primary local hospital/medical facility and one backup facility for each NPP site for evaluating and treating potentially contaminated, injured, and/or exposed individuals. The primary and backup hospitals/medical facilities for the public may be the same as those for the licensee employees and emergency workers. 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, but 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 hospital/medical facility and one emergency medical transportation services provider are located at least 5 miles outside the plume exposure pathway EPZ.

ORO include or reference written agreements with hospital/medical facilities and technical staff not employed by the hospital/medical facility. For additional information on medical and public health written agreements, refer to evaluation criterion A.4.

a. Facility and Staff Capabilities

Primary and backup facility and staff capabilities are addressed in individual hospital/medical facility plans/procedures. These plans/procedures specify the individual(s), by title/position, in charge of coordinating and updating their hospital/medical facility's plans/procedures,

Hospital/medical facility plans/procedures identify the number of radiologically trained medical personnel available, including a Radiation Safety Officer (RSO) and appropriate medical staff to supervise the evaluation and treatment of potentially contaminated, injured, and/or exposed individuals. Hospital/medical facility plans/procedures specify the

appropriate medical staff that will be present or readily available at all times during radiation emergency area (REA)³³ operations; hospital/medical facility plans/procedures include or reference listings of such staff. Although not required, a HPT or medical physicist should be available to assist the medical staff.

Plans/procedures specify the individual(s), by title/position, responsible for monitoring and determining the nature and extent of radiological contamination of incoming individuals. Licensee personnel, HPTs, trained hospital personnel, or members of the transport crew (see evaluation criterion L.4) may perform monitoring. If licensee personnel will perform radiological monitoring and contamination control for potentially contaminated, injured, and/or exposed individuals, plans/procedures document these arrangements and reference supporting written agreements.

Plans/procedures include what to do when the capabilities of the primary and backup facilities are exceeded. This may involve activating the additional facilities identified in evaluation criterion L.3.

Facility Plans/Procedures: Hospital/medical facility plans/procedures describe the following:

- Maximum number of contaminated, injured, and/or exposed patients who could be treated at one time;
- Contingencies in place if the number of patients requiring 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 mobilize and their responsibilities;
- Communication methods, particularly for emergency vehicles en route to the facility;
- Routes for incoming emergency vehicles;
- List of equipment available, including personal protective equipment (e.g., gloves, booties, etc.);
- 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 REA from the rest of the facility;
- Details for the monitoring and decontamination of patients, including controlling contamination, disposing of contaminated waste, and re-monitoring after decontamination;
- An example of the system used to record patient data;
- References to written agreements or LOAs with hospitals/medical facilities;
- References to written agreements or LOAs for technical staff that are not employed by the hospital/medical facility;
- Individual facility capabilities, including the number of radiologically trained medical personnel and support staff; and
- Hospital/medical facility and support service operations for treating potentially contaminated, injured, and/or exposed individuals.

³³ An REA is an area in a medical facility for monitoring, decontamination, and the potential treatment of contaminated, injured, and potentially exposed individuals, and for contamination control.

Staff Dosimetry Plans/Procedures: In addition, hospital/medical facility plans/procedures contain the following information regarding staff dosimetry:

- How to obtain assigned dosimetry;
- Organization responsible for issuing dosimetry;
- Individual, by title/position, or organization responsible for radiological monitoring and exposure record-keeping and processing;
- Mechanism for obtaining exposure records in special cases where dosimetry is not issued by the organization responsible for final record-keeping; and
- Dosimetry procedures, including record keeping and final receipt for processing.

REFERENCES

- Federal Register, Vol. 81, No. 180, pp. 63859-64044, Medicare and Medicaid Programs; Emergency Preparedness Requirements for Medicare and Medicaid Participating Providers and Suppliers; Final Rule, Centers for Medicare and Medicaid Services, September 16, 2016.
- National Incident Management System, Third Edition, October 2017.
- Occupational Safety Health Act, OSHA Best Practices for Hospital-Based First Receivers of Victims from Mass-Casualty Incidents, January 2005.
- The Emergency Medical Services Systems Act of 1973, Pub. L. No. 93-154 (1973), as amended.

EVALUATION CRITERION L.2

Arrangements for the medical treatment of contaminated, injured onsite personnel and those onsite personnel who have received significant radiation exposures and/or significant uptakes of radioactive material are described. These arrangements include the following components:

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

EVALUATION CRITERION L.2.a

An onsite first aid capability with adequate medical equipment and supplies.

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

EVALUATION CRITERION L.2.b

Primary and backup offsite medical facilities.

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

EVALUATION CRITERION L.2.c

Radiological controls capability, including the isolation of contamination, assessment of contamination levels, radiation exposure monitoring for medical facility staff, collection of contaminated waste, and decontamination of treatment areas.

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

EVALUATION CRITERION L.2.d

Provisions to evaluate for radiological contamination either prior to transport to a medical facility or after arrival.

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

EVALUATION CRITERION L.2.e

Contact information for facilities capable of treating overexposure to radioactive material.

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

EVALUATION CRITERION L.3

Supplemental lists are developed that indicate the location of the closest public, private, and military hospitals and other emergency medical facilities within the state or contiguous states considered capable of providing medical support for any contaminated, injured individual.

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

TO MEET THE INTENT OF EVALUATION CRITERION L.3, ORO PLANS/PROCEDURES INCLUDE:

- i. Supplemental lists of additional hospitals/medical facilities capable of providing medical support for contaminated, injured individuals. The list includes any special radiological capabilities.

EXPLANATION

In circumstances where primary and backup facilities are inundated with patients, plans/procedures identify additional public, private, and military medical hospitals/medical facilities within the state or contiguous states available to assist with overflow and provide medical surge support for contaminated, injured individuals. Supplemental lists are meant to be used only when needed and enable ORO officials to direct the public to additional facilities capable of handling contaminated, injured individuals.

This supplemental list includes the following information for each facility:

- Name of facility;
- Location of facility;
- Type of facility (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; and
- Any special radiological capabilities (e.g., specific radiologically trained staff such as health or medical physicists), the types of monitoring equipment available, and the facility's capabilities for analyzing samples for internal and external contamination.

This information may be included in an appendix.

REFERENCES

- FEMA Comprehensive Preparedness Guide 101, *Developing and Maintaining Emergency Operations Plans*, Version 2.0, November 2010.
- National Incident Management System, Third Edition, October 2017.

EVALUATION CRITERION L.4

Each organization arranges for the transportation of contaminated, injured individuals and the means to control contamination while transporting victims of radiological incidents to medical support facilities and the decontamination of transport vehicle following use.

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

TO MEET THE INTENT OF EVALUATION CRITERION L.4, ORO PLANS/PROCEDURES INCLUDE:

- i. The individual(s), by title/position, responsible for determining an appropriate hospital/medical facility and the determination process;
- ii. Means of transporting individuals;
- iii. How to request additional emergency medical transport services;
- iv. Process for maintaining communications between the transport crew and hospital/medical facility staff;
- v. Specifics of radiological monitoring and contamination control measures during transport;
- vi. Decontamination techniques, including trigger/action levels; and
- vii. Dosimetry for the transport crew.

EXPLANATION

Transporting radiologically contaminated, injured individuals involves more than moving an individual from the incident scene to a hospital/medical facility. Plans/procedures address the vehicles, equipment, procedures, and personnel needed for medical transportation support, including written agreements from transportation providers. For additional information on written agreements with medical transportation providers, refer to evaluation criterion A.4.

The following topics are included in this discussion.

a. Appropriate Medical Facility

Plans/procedures identify the individual, by title/position, responsible for arranging transportation to the appropriate hospital/medical facility for contaminated, injured individuals. Plans/procedures include the process for selecting a facility based on the extent of contamination and nature of the injuries. For patients with urgent medical conditions (e.g., serious injury), the plans/procedures establish priorities between addressing contamination and the need for prompt transportation to a medical facility. Individuals with critical medical conditions (e.g., heart attack) are transported directly to the nearest facility regardless of the plume exposure pathway EPZ conditions.

b. Transport of Individuals

Two factors are considered in determining the appropriate type of vehicle to transport contaminated, injured 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., automobile, van, bus) may be used. When more severe symptoms or injuries are present, emergency workers use specialized vehicles (e.g., ambulance, medevac, or critical care unit). Plans/procedures address the process for activating written agreements for additional emergency medical transport 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 transport crews maintain communication with the hospital/medical facility to allow for advance preparations for treatment. Procedures identify the individual, by title/position, responsible for receiving notification from the transport crew and notifying REA staff to begin setup. Procedures include a list of information that is provided to the receiving hospital/medical facility (e.g., the individual's physical condition, vital signs, type of radiological contamination, and estimated time of arrival).

d. Monitoring of Individuals

Plans/procedures identify the individual, by title/position, responsible for monitoring an individual to determine the nature and extent of external radiological contamination. Licensee personnel, HPTs, 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 individuals, LOAs support these arrangements.

Plans/procedures 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 hospital/medical facility, plans/procedures state that transport crews assume the individual is contaminated and employ appropriate contamination control measures. Plans/procedures 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 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. Contamination control measures are only intended to control the spread of contamination and will not protect the patient or attendants from radiation; as such, 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/tribal emergency management agency) responsible for issuing and collecting dosimetry and describe how the transport crew would obtain their dosimetry.

REFERENCES

- 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*, Third Edition, October 2017.

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

General plans for recovery and reentry are developed.

EVALUATION CRITERION M.1

General recovery, reentry, and return plans for radiological incidents are developed, as appropriate. These plans address reoccupancy, as appropriate. The plans should include:

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

TO MEET THE INTENT OF EVALUATION CRITERION M.1, ORO PLANS/PROCEDURES INCLUDE:

- i. Planned recovery efforts, including a list of recovery-specific actions and organizations responsible for carrying them out;
- ii. The process for public reentry into restricted areas;³⁴
- iii. The process for establishing restricted areas; and
- iv. The process for establishing reoccupancy decisions.

EXPLANATION

Following the EPA PAG Manual's three phases of a radiological incident (early, immediate, and late), this evaluation criterion addresses the post-plume activities regarding recovery, reentry, return, and reoccupancy during the intermediate and late phases. The three phases are defined as:

- **Early Phase** – The beginning of a radiological incident when immediate decisions for effective use of protective actions are needed and must therefore be based primarily on the status of the radiological incident 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 be used. Protective actions based on the PAGs may be preceded by precautionary actions during the period. This phase may last from hours to days.
- **Intermediate Phase** – The period beginning after the source and releases have been brought under control (has not necessarily stopped, but is no longer growing) and reliable environmental measurements are available for use as a basis for decisions on protective actions and extending until these additional protective actions are no longer needed. This phase may overlap the early phase and late phase and may last from weeks to months.
- **Late Phase** – The period beginning when recovery actions designed to reduce radiation levels in the environment to acceptable levels are commenced and ending when all recovery actions have been completed. This phase may extend from months to years. A PAG level, or dose to avoid, is not appropriate for long-term cleanup.

a. Recovery

Recovery, in a broad sense, is accomplished through the timely restoration, strengthening, and revitalization of infrastructure, housing, and a sustainable economy, as well as the health, social, cultural, historic, and environmental fabric of communities affected by a catastrophic incident. Specifically, recovery from a radiological incident refers to the process of reducing radiation exposure rates and concentrations of radioactive material in the environment to acceptable levels for the return of the general public for return or use after the early phase of an incident.

³⁴ Restricted area includes the restricted area and buffer zone. A restricted area is an area of controlled access from which the population has been evacuated or relocated. A buffer zone is an area adjacent to a restricted area where reentry may be allowed, but for which protective actions are recommended to minimize exposure to radiation and spread of contamination.

The process for recovery from a radiological incident is described in the plans/procedures, including outlining actions to be taken in the recovery process and identifying the organization(s) responsible for executing recovery activities. Plans/procedures describe ongoing environmental radiological measurements, dose assessment, and sampling plans (refer to evaluation criterion M.7 for additional information on sampling plans and evaluation criterion M.8 for additional information on dose assessment).

Radiological accident assessment will continue during the intermediate and late phases (refer to planning standard I for additional information on accident assessment). Activities may include: (1) air and soil sampling and analysis; (2) dose assessment and projection; and (3) establishing restricted areas. A restricted area (i.e., any area to which access is controlled for the protection of individuals from exposure to radiation and radioactive materials) is comprised of the restricted area and the buffer zone. Criteria for establishing a restricted area are identified in the plan/procedures, including establishing an appropriate buffer zone to reduce potential resuspension of radioactive materials into occupied areas.

b. Reentry

Reentry can occur during the early, intermediate, and late phases; this evaluation criterion speaks to post-plume reentry activities. Workers or members of the public who have been displaced from a restricted area, may be allowed to reenter under controlled conditions to perform additional emergency response activities or to carry out specific types of personal business. For example, farmers may be permitted to reenter a restricted area to provide essential care for livestock.

Plans and procedures include provisions to allow reentry into a restricted area, as further described under evaluation criterion M.1.b.

c. Return

Return refers to permanent resettlement in evacuation or relocation areas with no restrictions, based on acceptable environmental and public health conditions. Restricted areas must be below radiation protection criteria for relocation before the evacuated or relocated persons are allowed to return to their homes and businesses. Plans/procedures include the processes for relaxing protective actions and allowing for the public to return to previously restricted areas, as further described in evaluation criterion M.5.

All procedures to support reentry 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.

d. Reoccupancy

Reoccupancy refers to the return of households and communities to relocation areas³⁵ during the cleanup process, at radiation levels acceptable to the community. Since final cleanup goals may take years to achieve, reoccupancy of the affected area will be possible when interim cleanup can reduce short-term exposures to acceptable levels while work continues to achieve long-term goals. Reoccupancy is based on the belief that early community involvement focusing on desired post-incident uses of the land, will result in expedited, cost-effective, and publicly-supported cleanups. Furthermore, community decision-makers should bring together a broad group of stakeholders (residents, local business owners, local government officials, etc.) interested in the rebuilding of their communities and ensure the group is a voice for the entire community, rather than a few interested parties.

After an incident, cleanup and reoccupancy are likely to occur subarea by subarea in order of priority and community assessments. Critical infrastructure is likely to have been restored to some level of functionality; however, further remediation of infrastructure should be evaluated against the final cleanup goal. A community-based, transparent development of priorities would follow, resulting in sequential actions to remediate and reoccupy areas (e.g., residential, commercial) utilizing temporary cleanup levels that would be considered acceptable for an interim period of time, prior

³⁵ Areas where people (households) have been removed or excluded from contaminated areas to avoid chronic radiation exposure. May also be referred to as Restricted Area.

to final cleanup goals being achieved. Land use may need to be changed in a subarea where it is not feasible, with a combination of remediation with engineering and institutional controls, to support the pre-incident land use in a manner that protects human health. In all cases, an appropriate population health monitoring program should be implemented proportionate to the potential or estimated health risk.

REFERENCES

- EPA-400/R-17/001, PAG Manual: Protective Action Guides and Planning Guidance for Radiological Incidents, January 2017.
- National Disaster Recovery Framework, Second Edition, June 2016.
- National Incident Management System, Third Edition, October 2017.
- Nuclear/Radiological Incident Annex to the Response and Recovery Federal Interagency Operational Plans, October 2016.
- Recovery Federal Interagency Operational Plan, Second Edition, August 2016.

EVALUATION CRITERION M.1.a

Provisions for allowing reentry into areas controlled by the licensee. Reentry planning includes evaluation of the controls necessary for reentry under post-incident conditions.

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

EVALUATION CRITERION M.1.b

Provisions for reentry into restricted areas, including exposure and contamination control, as appropriate. A method for coordinating and implementing decisions regarding temporary reentry into restricted areas is addressed.

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

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

- i. The process for authorizing reentry, including the individual(s), by title/position, authorized to grant access into a restricted area;
- ii. The evaluation criteria/method for approving reentry requests;
- iii. The access control process for reentry, including the authorization verification method by access control/check point officials;
- iv. Provisions for exposure control of those authorized reentry;
- v. Contamination control practices within a restricted area; and
- vi. Methods and resources for monitoring and decontamination of individuals exiting a restricted area.

EXPLANATION

Plans/procedures specify the individual(s), by title/position, authorized to grant access into a restricted area and include associated authorization processes. Plans/procedures outline the criteria and activities that warrant restricted area access, and describe the process for evaluating reentry requests. Requests for reentry are evaluated on an individual basis and not automatically approved for any particular group (e.g., farmers). Plans/procedures include information on the types of reentry permitted and under what conditions reentry are permissible. Some conditions include: (1) the use of ACPs to issue dosimetry to reentering individuals, including training on dosimetry use; (2) use of stay times (i.e., the amount of time a person can safely stay in a restricted area without exceeding their exposure limit), depending on the location of the reentry destination; (3) use of a health physicist escort or other personal escort trained in the use of dosimetry; and (4) provisions for monitoring and decontaminating exiting individuals.

Plans/procedures include the access control process, including the method for an access control/check point attendant to verify authorization for reentry into a restricted area (e.g., an official authorization form). Further, individuals reentering into a restricted area are provided the appropriate PRD and DRD. The DRD must have a range capable of detecting level(s) of radiation exposure that may be received within a restricted area. Exposure limits are provided to individuals reentering a restricted area based on the mission, but also limited to applicable Federal guidance. The process for recording individuals' accumulated exposure while in a restricted area is described in plans and procedures.

To ensure that proper reentry procedures are followed, training on basic radiation protection and contamination control is provided (or verified) to individuals reentering the restricted area, prior to gaining entry. OROs identify who is responsible for verifying and providing this training in the plans. Appropriate PPE is provided and worn while in the restricted area to reduce personal contamination.

To avoid the spread of contamination, plans/procedures describe provisions and resources to monitor and decontaminate individuals exiting the restricted area. Monitoring and decontamination stations are set at egress points within the established buffer zone(s), with identified trigger levels to prompt decontamination activities. The process for decontamination is described in plans and procedures, including the process for when repeated attempts to decontaminate are unsuccessful. Provisions for collecting, controlling, and disposing radioactive contaminated waste is also described.

REFERENCES

- EPA-400/R-17/001, PAG Manual: Protective Action Guides and Planning Guidance for Radiological Incidents, January 2017.
- Nuclear/Radiological Incident Annex to the Response and Recovery Federal Interagency Operational Plans, October 2016.

EVALUATION CRITERION M.2

Individuals that will comprise the licensee's recovery organization are identified by title/position. The recovery organization includes technical personnel with responsibilities to develop, evaluate, and direct recovery and reentry operations.

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

EVALUATION CRITERION M.3

The process for initiating recovery actions is described and includes the criteria for terminating the emergency.

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

EVALUATION CRITERION M.4

The process for initiating recovery actions is described and includes provisions to ensure continuity during transfer of responsibility between phases. The chain of command is established.

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

TO MEET THE INTENT OF EVALUATION CRITERION M.4, ORO PLANS/PROCEDURES INCLUDE:

- The process for initiating recovery actions;
- Provisions for continuity during transfer of responsibility from the emergency phase to the recovery phase;
- Changes that may take place in the organizational structure, to include the chain of command; and
- The means to keep all involved response organizations informed of the recovery efforts.

EXPLANATION

Recovery planning may take place prior to the initiating conditions of an incident have stabilized and immediate actions to protect public health, safety, and property are accomplished. Plans/procedures describe the process of moving from emergency activities to recovery activities, including the transition process from emergency response to recovery activities. A clearly established chain of command for the recovery phase is identified in plans/procedures, including potential changes in organizational authority. For example, in circumstances where the Governor is in charge of the emergency response, he/she may delegate to another authority organization to take charge of recovery actions.

Plans/procedures include information on the means for keeping all response organizations informed of ongoing efforts during the intermediate and late phases of an incident. Information such as what remedial measures will be taken, how long they will take, and expected final outcome.

REFERENCES

- EPA-400/R-17/001, PAG Manual: Protective Action Guides and Planning Guidance for Radiological Incidents, January 2017.
- National Disaster Recovery Framework, Second Edition, June 2016.
- Nuclear/Radiological Incident Annex to the Response and Recovery Federal Interagency Operational Plans, October 2016.
- Recovery Federal Interagency Operational Plan, Second Edition, August 2016.

EVALUATION CRITERION M.5

The framework for relaxing protective actions and allowing for return are described. Prioritization is given to restoring access to vital services and facilities.

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

TO MEET THE INTENT OF EVALUATION CRITERION M.5, ORO PLANS/PROCEDURES INCLUDE:

- i. Criteria for relaxing protective actions and allowing for public return;
- ii. The process for allowing public return into a previously restricted area; and
- iii. A process for establishing priorities in restoring vital services and facilities to areas where return is permitted.

EXPLANATION

Plan/procedures clearly identify criteria that must be met for relaxing protective actions and allowing the public to return to previously restricted areas. These criteria are based on Federal guidance and collected environmental monitoring information.

Plans/procedures describe the process for allowing the public to return to previously restricted areas, including the entities involved in the decision-making and basis for decisions. Radiation protection considerations must be addressed in concert with health, environmental, economic, social, psychological, cultural, ethical, political, and other regional considerations. Thus, many Federal, state, and local/tribal agencies will play important roles in this decision-making process. During the late phase of a radiological incident, decision-makers will have more time and information allowing for better data collection, more complex modeling, stakeholder involvement, and options analysis. Community members will influence decisions such as if and when to allow people to return home to contaminated areas. There will be populations, who were not relocated or evacuated, living in contaminated areas where efforts to reduce exposures will be ongoing. Implicit in these decisions is the ability to balance health protection with the desire of the community to resume normal life.

Restoration of vital services and facilities are prioritized and taken into account during the recovery process in order to provide populations adequate resources when they are ultimately allowed to return. Prioritization is given to services such as schools, healthcare/medical services, and basic utilities (e.g., electricity and water).

REFERENCES

- EPA-400/R-17/001, PAG Manual: Protective Action Guides and Planning Guidance for Radiological Incidents, January 2017.
- National Disaster Recovery Framework, Second Edition, June 2016.
- Nuclear/Radiological Incident Annex to the Response and Recovery Federal Interagency Operational Plans, October 2016.
- Recovery Federal Interagency Operational Plan, Second Edition, August 2016.

EVALUATION CRITERION M.6

The organization(s) responsible for developing and implementing cleanup operations offsite is identified.

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

TO MEET THE INTENT OF EVALUATION CRITERION M.6, ORO PLANS/PROCEDURES INCLUDE:

- The appropriate local, state, tribal or Federal organization(s) responsible for cleanup operations; and
- Resources that may be needed to conduct cleanup efforts.

EXPLANATION

Early cleanup efforts may begin as early as the intermediate phase and continue through the late phase. Procedures to remediate radioactive materials may need to be developed for areas where deposition occurred.

Plans/procedures specify the appropriate Federal, state, local, and tribal organization(s) with primary responsibility for determining the need for, and carrying out, cleanup operations of radioactive waste. Plans/procedures take into account resources that may be needed by the responsible organizations to conduct cleanup efforts. Applicable Federal guidance is considered during the cleanup process.

REFERENCES

- EPA-400/R-17/001, PAG Manual: Protective Action Guides and Planning Guidance for Radiological Incidents, January 2017.
- National Disaster Recovery Framework, Second Edition, June 2016.
- National Incident Management System, Third Edition, October 2017.
- Nuclear/Radiological Incident Annex to the Response and Recovery Federal Interagency Operational Plans, October 2016.
- Price-Anderson Nuclear Industries Indemnity Act of 1957, Pub. L. No. 85-256 (1957) (codified as amended at 42 U.S.C. § 2210).
- Recovery Federal Interagency Operational Plan, Second Edition, August 2016.

EVALUATION CRITERION M.7

Provisions for developing and modifying sampling plans are established. Provisions for laboratory analysis of samples are included in the plan.

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

TO MEET THE INTENT OF EVALUATION CRITERION M.7, ORO PLANS/PROCEDURES INCLUDE:

- The process for developing and modifying sampling plans;
- Identification of laboratories to process samples; and
- A description of each identified laboratory's sampling capability and capacity.

EXPLANATION

Ongoing sampling will be necessary throughout the three phases of a radiological incident. Sampling plans will initially focus on determining if populations have been evacuated from areas where public health and safety is impacted by the contamination levels. As the response progresses into the intermediate phase, sampling plans are modified as appropriate to include consideration of the human food chain, and further evolve into decision-making on reentry.

During the intermediate and late phases, sampling plans will continually evolve and determine what additional, specific analyses will be required (e.g., strontium analysis) before individuals are able to safely return. When conducting additional, specific analyses during these phases, it is important for plans/procedures to identify laboratories and their capabilities and capacity to conduct all necessary types of analysis. Especially for laboratories capable of processing complex samples (e.g., strontium), where an abundance of samples are expected to come through for analysis, plan/procedures capture the laboratory capacity and expected processing timeframe. As applicable, plans/procedures identify any laboratory restrictions, such as limitations on analyzing radiation levels of samples, posed against the designated laboratories.

REFERENCES

- EPA-400/R-17/001, *PAG Manual: Protective Action Guides and Planning Guidance for Radiological Incidents*, January 2017.
- *National Disaster Recovery Framework*, Second Edition, June 2016.
- *National Incident Management System*, Third Edition, October 2017.
- *Nuclear/Radiological Incident Annex to the Response and Recovery Federal Interagency Operational Plans*, October 2016.
- *Recovery Federal Interagency Operational Plan*, Second Edition, August 2016.

EVALUATION CRITERION M.8

A method for periodically conducting radiological assessments of public exposure is established.

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

TO MEET THE INTENT OF EVALUATION CRITERION M.8, ORO PLANS/PROCEDURES INCLUDE:

- i. The agencies responsible for, and involved in, long-term dose assessment activities post-incident; and
- ii. The method for periodically conducting radiological assessments of public exposure, including estimation of the health impacts.

EXPLANATION

The purpose of this evaluation criterion is to provide a basis for estimating the health effects from the radiological incident. The plans/procedures include information about how the state, local, or tribal jurisdiction will estimate total population exposure caused by the incident from all pathways. One or more Federal agencies (e.g., DOE, NRC, EPA) may perform the dose assessment process in coordination with state, local or tribal agencies.

REFERENCES

- Centers for Disease Control and Prevention (CDC), *Population Monitoring in Radiation Emergencies: A Guide for State and Local Public Health Planners*, Second Edition, April 2014.
- EPA-400/R-17/001, *PAG Manual: Protective Action Guides and Planning Guidance for Radiological Incidents*, January 2017.
- *Nuclear/Radiological Incident Annex to the Response and Recovery Federal Interagency Operational Plans*, October 2016.

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.

EVALUATION CRITERION N.1

Exercises and drills are conducted, observed, and critiqued/evaluated as set forth in NRC and FEMA regulations and guidance.

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

TO MEET THE INTENT OF EVALUATION CRITERION N.1, ORO PLANS/PROCEDURES INCLUDE:

- i. Exercises are conducted in accordance with NRC and FEMA regulations and guidance.

EXPLANATION

Once plans/procedures are developed and staff are trained in the response functions, exercises are conducted to demonstrate the capabilities that are described to ensure they can be functionally implemented. Exercises are a component of FEMA's reasonable assurance determination that OROs' plans/procedures are adequate to protect public health and safety in the vicinity of commercial NPPs. Part III of this Manual provides detailed information on REP exercise development, conduct, and documentation.

The NPS is broken up into six parts: (1) Identifying and Assessing Risk; (2) Estimating Capability Requirements; (3) Building and Sustaining Capabilities; (4) Planning to Deliver Capabilities; (5) Validating Capabilities; and (6) Reviewing and Updating Preparedness Efforts. The NPS outlines an organized process for the whole community to move forward with their preparedness activities and achieve the National Preparedness Goal, which organizes actions to plan, organize, equip, train, and exercise the capabilities necessary to prevent, protect against, mitigate the effects of, respond to, and recover from those threats and hazards that pose the greatest risk to the security of the nation.

As a component of the NPS, the National Exercise Program (NEP) is the principal mechanism for examining readiness and validating nation-wide preparedness across the entire homeland security, public safety, and emergency management enterprise. One of the main features of the NEP is the HSEEP. The HSEEP methodology consists of fundamental principles that frame a common approach to exercises. Applying these principles to both the management of an exercise program and the execution of individual exercises is critical to the effective examination of capabilities. The use of HSEEP—in line with the National Preparedness Goal and the NPS—supports efforts across the whole community that improve our national capacity to achieve the core capabilities and associated capability targets.

In concert with the NEP, REP exercises incorporate the HSEEP methodology and associated guidance to align and standardize exercise program management, including design, development, conduct, evaluation, and improvement planning. However, it is important to note that HSEEP does not supersede the planning standards found within 44 CFR 350.5 and should work in tandem with the guidance found within NUREG-0654/FEMA-REP-1, Rev. 2, specifically the evaluation criteria found under the planning standards.

REFERENCES

- 6 U.S.C. Sec. 744, Establishment of national preparedness system.
- FEMA Comprehensive Preparedness Guide 101, *Developing and Maintaining Emergency Operations Plans*, Version 2.0, November 2010.
- *Homeland Security Exercise and Evaluation Program (HSEEP)*, April 2013.

EVALUATION CRITERION N.1.a

The process to critique/evaluate exercises and drills is described.

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

TO MEET THE INTENT OF EVALUATION CRITERION N.1.a, ORO PLANS/PROCEDURES INCLUDE:

- i. The process to critique and evaluate exercises and drills utilizes FEMA REP's assessment methodology.

EXPLANATION

FEMA evaluators evaluate OROs' performance in accordance with the FEMA REP assessment methodology. Part III of this Manual addresses the Program's assessment methodology derived from the planning standards and core capabilities. Part III contains detailed guidance on the development, conduct, evaluation, and documentation of REP exercises and post-exercise critiques.

REP Program activities present opportunities for OROs to test and evaluate their own performance. Consideration should be given to identifying a method for or process through which ORO exercise controllers and observers capture and share observations.

REFERENCES

- FEMA Comprehensive Preparedness Guide 101, *Developing and Maintaining Emergency Operations Plans*, Version 2.0, November 2010.
- Homeland Security Exercise and Evaluation Program (HSEEP), April 2013.

EVALUATION CRITERION N.1.b

The process used to track findings and associated corrective actions identified by drill and exercise critiques/evaluations, including their assignment and completion, is described.

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

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

- i. A description of the process for tracking identified findings and any associated corrective actions from identification through resolution.

EXPLANATION

Plans/procedures describe the process for tracking findings and/or issues identified during drills/exercises and the corresponding corrective actions to resolve them. This process includes a description of the identified finding/issue and its associated corrective action(s); the organization and individual, by title/position, responsible for implementing the corrective action(s); and the timeframe for completion. The results of drills and exercises and verification that identified corrective actions are being implemented or have been completed are reported in the ALC.

There is a separate process for Level 1 findings, which can be found in Part III of this Manual.

REFERENCES

- FEMA Comprehensive Preparedness Guide 101, *Developing and Maintaining Emergency Operations Plans*, Version 2.0, November 2010.
- Homeland Security Exercise and Evaluation Program (HSEEP), April 2013.

EVALUATION CRITERION N.1.c

A drill or exercise starts between 6:00 p.m. and 4:00 a.m. at least once every eight-year exercise cycle.

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

EVALUATION CRITERION N.1.d

A drill or exercise is unannounced at least once every eight-year exercise cycle.

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

EVALUATION CRITERION N.2

Exercises are designed to enable the response organizations' demonstration of the key skills and capabilities necessary to implement the emergency plan. The following two types of exercises are conducted at the frequency noted:

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

TO MEET THE INTENT OF EVALUATION CRITERION N.2, ORO PLANS/PROCEDURES INCLUDE:

- i. All major elements of plans/procedures are tested at the minimum frequency specified.

EXPLANATION

Plans/procedures address the use of exercises to demonstrate the ORO's capabilities to respond to an incident at a commercial NPP.

State, local, and tribal OROs must conduct joint full participation exercises with the licensee biennially (i.e., at least every two 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 plume exposure pathway EPZ of such a site. The current exercise cycle is eight calendar years and began on the year in which the first joint HAB scenario exercise was evaluated by FEMA.

Full participation exercise: 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 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 NPP is tested; and (3) the implementation of the observable portions of state and/or local plans is tested.

Partial participation exercise: The regulatory requirements give OROs the flexibility to partially participate in some biennial exercises. OROs with multiple sites may rotate their full participation among the sites (i.e., when not fully participating at a site, the ORO partially participates to support other participating OROs). OROs are still required to fully participate in at least one exercise that utilizes each of the scenario elements described in evaluation criterion N.3 and its sub-criteria during each eight-year exercise cycle. If an ORO lies within the plume exposure pathway EPZ of more than one NPP and full participation poses an undue hardship, the ORO may request permission to partially participate. OROs submit requests and receive approval for exemption from full participation to the FEMA Regional Office. It should also be noted that although an ORO has been granted an exemption from full participation, FEMA may have an evaluator at locations where partial participation occurs. If actions taken at a location where partial participation occurs negatively affects those fully participating, it is subject to the same issues and findings as during a normal exercise evaluation. Approved partial participation must be clearly described in the extent-of-play agreement.

REFERENCES

- 44 CFR 350.9.

EVALUATION CRITERION N.2.a

Plume Exposure Pathway Exercises. *Plume exposure pathway exercises are conducted biennially. These exercises include mobilization of licensee, and state, local, and tribal government personnel and resources and implementation of emergency plans to demonstrate response capabilities within the plume exposure pathway EPZ.*

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

TO MEET THE INTENT OF CRITERION N.2.a, ORO PLANS/PROCEDURES INCLUDE:

- i. Capabilities are exercised at least biennially in response to a plume exposure pathway scenario; and
- ii. Exercise scenarios include a radioactive release of such a magnitude that it drives accomplishment of the exercise objectives.

EXPLANATION

Plume exposure pathway exercises are conducted biennially using scenarios that result in a simulated release or significant threat of release of radioactive material to the environment; OROs are driven to demonstrate their capability to integrate with other response organizations to implement emergency plans and respond to an incident at an NPP. These scenarios include varied release conditions, non-sequential escalation of ECLs, and include HAB incidents. Plume scenarios simulate actual or potential conditions, which trigger PADs for the public (i.e., evacuation, shelter-in-place) at varying distances in the plume exposure pathway EPZ. The simulation of actual conditions include the indication of a simulated offsite release verified by simulated field monitoring and sampling data. Potential conditions are simulated through dose projections indicating the potential to exceed PAGs or deteriorated(ing) plant conditions that may necessitate the development of protective actions.

REFERENCES

- 44 CFR 350.9.
- Homeland Security Exercise and Evaluation Program (HSEEP), April 2013.

EVALUATION CRITERION N.2.b

Ingestion Exposure Pathway Exercises. *Ingestion exposure pathway exercises are conducted at least once every eight years. These exercises include mobilization of state, local, and tribal government personnel and resources and implementation of emergency plans to demonstrate response capabilities to a release of radioactive materials requiring post-plume phase protective actions within the ingestion exposure pathway EPZ.*

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

TO MEET THE INTENT OF EVALUATION CRITERION N.2.b, ORO PLANS/PROCEDURES INCLUDE:

- i. Capabilities are exercised at least once every eight years in response to an ingestion exposure pathway scenario;
- ii. The numbers and types of personnel participating in an ingestion exposure pathway exercise will be sufficient for demonstrating capabilities required by the plans/procedures; and
- iii. OROs within the 50-mile ingestion exposure pathway EPZ that are not part of the full participation ingestion exercise with the state, participate in an ingestion TTX or other ingestion pathway training activity at least once during each eight-year exercise cycle.

EXPLANATION

States within the ingestion exposure pathway EPZ of an NPP site must participate in an ingestion pathway exercise at least once every eight years with that site. States that do not have an NPP located within their borders, but are located within the

ingestion exposure pathway EPZ of a border state's NPP, must fully participate in at least once every eight years with the bordering state's site(s). If a state is within the ingestion exposure pathway EPZ of a site located in a bordering state, and also has a site located within its own state borders, the state may partially participate in the ingestion exposure pathway exercises for those bordering state sites; the level of participation may vary. States that have multiple NPP sites rotate their participation from site to site; no partial participation is required.

In some states, local governments have responsibilities that require their participation in ingestion exposure pathway exercises. In other states, state officials would be the primary emergency personnel involved in the ingestion exposure pathway portion of the exercises. Regardless of roles and responsibilities, the number and function of personnel that participate in an ingestion pathway exercise should be sufficient for demonstrating and carrying out protective action measures that are necessitated by an ingestion exposure pathway incident scenario. Furthermore, organizations with field sampling responsibilities that are fully participating in the ingestion pathway portion of an exercise deploy their Field Teams and demonstrate collecting and analyzing samples, as dictated by the scenario.

These ingestion exposure pathway incident activities may be performed either in connection with, or separate from, a plume exposure pathway EPZ exercise. Separating ingestion from plume activities would provide OROs with additional time for performing these activities. If separated, the plume technical data may be extended into ingestion exposure pathway activities. However, the basis for performing the ingestion exposure pathway activities may be derived from technical data other than what was used in a previous plume exercise.

During the year in which a full participation ingestion exposure pathway EPZ exercise is held, the applicable OROs review their ingestion exposure pathway plans/procedures for the other sites within the state to verify their accuracy and completeness. This review validates the identification of farms, human food processors, and distributors.

REFERENCES

- 44 CFR 350.9.
- Homeland Security Exercise and Evaluation Program (HSEEP), April 2013.

EVALUATION CRITERION N.3

Exercise Scenario Elements. During each eight-year exercise cycle, biennial, evaluated exercise scenario content is varied to provide the opportunity to demonstrate the key skills and capabilities necessary to respond to the following scenario elements:

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

TO MEET THE INTENT OF EVALUATION CRITERION N.3, ORO PLANS/PROCEDURES INCLUDE:

- Scenarios for exercises are varied from exercise to exercise to provide opportunity for appropriate capabilities to be demonstrated; and
- All exercise scenario elements are utilized during each eight-year exercise cycle.

EXPLANATION

Exercises are a component of FEMA's reasonable assurance determination that ORO plans/procedures are adequate and can be implemented to protect public health and safety in the vicinity of an operating or proposed commercial NPPs. Exercise scenarios are varied 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, simulated incidents.

The scenario elements are further described in the sub-criteria of this evaluation criterion. The scenario elements are intended to enhance the variability of exercises and minimize any negative training practices. The initiating event of an exercise scenario is varied to go beyond the traditional equipment malfunctions and operator actions.

a. Scenario Elements

In an effort to encourage less predictable scenarios, FEMA and the NRC have identified the following scenario elements: (1) HAB (see evaluation criterion N.3.a); (2) rapid escalation (see evaluation criterion N.3.b); (3) no/minimal release of radioactive materials (see evaluation criterion N.3.c); and (4) resource integration (see evaluation criterion N.3.d).

b. Cause and Magnitude of Radioactive Release

Exercise planners and scenario developers may vary the cause and magnitude of the scenario's radioactive release. However, the radioactive release must be of such a magnitude that it drives accomplishment of the joint exercise objectives. To accomplish this, FEMA is involved in the early stages of scenario development to assist and validate the effectiveness of the scenario.

Further, the scenarios should also be varied such that there are opportunities to demonstrate response to a wide spectrum of incidents, such as varying degrees of: core damage, radiological release, and hostile action directed at the NPP site. Varying the scenarios allows for realistic simulated actions, both onsite and offsite to mitigate the consequences of the incident.

c. Optional Scenario Variations

These scenario variations are not requirements, but rather areas for consideration as part of scenario development.

1. **Varied radiological release effects and meteorological conditions.** Varying release effects and meteorological conditions is one way to enhance realism in exercise play. This variation should be consistent with plant design, site location, and geography.
2. **A broader spectrum of initiating/concurrent events.** Other incidents may be considered as possible scenario-initiating or concurrent events, based on applicability to the site. Examples include:
 - Natural disasters that are historically applicable to the area (e.g., hurricane, tornado, earthquake, flooding, etc.);
 - Site-specific incidents (e.g., an accident involving a near-site facility, a train derailment on or adjacent to a site owner controlled area, etc.); and
 - Seasonal factors impacting the development of the protective action decision-making process (e.g., transient populations, weather conditions, agricultural seasons, etc.).

REFERENCES

- 10 CFR Part 50, Appendix E, Section IV.F.
- 44 CFR Part 351, Subpart C.
- *Homeland Security Exercise and Evaluation Program (HSEEP)*, April 2013.

EVALUATION CRITERION N.3.a

Hostile Action-Based (HAB). Hostile action directed at the NPP site. This scenario element may be combined with either a radiological release scenario or a no/minimal radiological release scenario, but a no/minimal radiological release scenario should not be included in consecutive HAB exercises at an NPP site.

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

TO MEET THE INTENT OF EVALUATION CRITERION N.3.a, ORO PLANS/PROCEDURES INCLUDE:

- i. The HAB scenario element is utilized at least once during each eight-year exercise cycle; and
- ii. The HAB scenario element is not combined with the no/minimal radiological release scenario in consecutive exercises at a single site.

EXPLANATION

The HAB scenario element entails hostile action(s) directed at the NPP site and involves 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. A HAB incident may overwhelm state, local, and tribal response agencies, and may also involve response from agencies not normally involved in a REP response or exercise. Extent-of-play agreement discussions should consider varying attack scenarios (e.g., insider threat or ground, waterborne, airborne, or a combination of attacks) every eight-year exercise cycle, as applicable to the NPP site. A “no release” scenario element cannot be used in conjunction with the HAB scenario element in consecutive exercises at a particular NPP site. The HAB scenario element is utilized in at least once during each eight-year exercise cycle.

REFERENCES

- FEMA Comprehensive Preparedness Guide 101, *Developing and Maintaining Emergency Operations Plans*, Version 2.0, November 2010.

EVALUATION CRITERION N.3.b

Rapid Escalation. An initial classification of, or rapid escalation to, an SAE or GE.

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

TO MEET THE INTENT OF EVALUATION CRITERION N.3.b, ORO PLANS/PROCEDURES INCLUDE:

- i. A rapid escalation scenario element is utilized at least once during each eight-year exercise cycle.

EXPLANATION

Rapid escalation is defined as an initial classification of or rapid escalation, within 30 minutes, to a SAE or GE. In a real incident, NPP conditions may rapidly deteriorate, resulting in an initial declaration of a SAE, or skipping an ECL altogether. For example, under this scenario element, the scenario could begin at a SAE or GE, rapidly progress to a SAE or GE, or skip an ECL and go straight to a SAE from an NOUE classification, bypassing an Alert. This scenario is used at least once during each eight-year exercise cycle.

REFERENCES

- FEMA Comprehensive Preparedness Guide 101, *Developing and Maintaining Emergency Operations Plans*, Version 2.0, November 2010.
- 10 CFR Part 50, Appendix E, Section IV.F.

NUREG CRITERION N.3.c

No/Minimal Release of Radioactive Materials. No release or an unplanned minimal release of radioactive material which does not require public protective actions. This scenario element is used only once during each eight-year exercise cycle.

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

TO MEET THE INTENT OF EVALUATION CRITERION N.3.c, ORO PLANS/PROCEDURES INCLUDE:

- i. A no/minimal radioactive material release scenario element is utilized only once each eight-year exercise cycle and is optional for state, local, and tribal governments.

EXPLANATION

This scenario element involves no radiological release or an unplanned minimal radiological release that requires the site to declare a SAE, but does not require the declaration of a GE. Utilizing this scenario element helps avoid anticipatory responses. Licensees are required to use this variable at least once during each eight-year exercise cycle. OROs are encouraged, but not required, to participate in this exercise with the licensee; this is further addressed in evaluation criterion N.3.c.1.

REFERENCES

- 10 CFR Part 50, Appendix E, Sec IV.F.
- FEMA Comprehensive Preparedness Guide 101, *Developing and Maintaining Emergency Operations Plans*, Version 2.0, November 2010.

EVALUATION CRITERION N.3.c.1

The licensee is required to demonstrate the ability to respond to a no/minimal radiological release scenario. State, local, and tribal government response organizations have the option, and are encouraged, to participate jointly in this demonstration. If the offsite organizations elect not to participate in the licensee's required minimal or no release exercise, the OROs will still be obligated to meet the exercise requirements as specified in 44 CFR 350.9.

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

TO MEET THE INTENT OF EVALUATION CRITERION N.3.c.1, ORO PLANS/PROCEDURES INCLUDE:

- i. ORO participation is optional for a no/minimal release scenario.

EXPLANATION

Licensees are required to use this variable once during each eight-year exercise cycle. OROs are encouraged, but not required, to participate in this exercise with the licensee.

REFERENCES

- 10 CFR Part 50, Appendix E, Sec IV.F.
- FEMA Comprehensive Preparedness Guide 101, *Developing and Maintaining Emergency Operations Plans*, Version 2.0, November 2010.

EVALUATION CRITERION N.3.c.2

When planning for a joint no/minimal radiological release exercise, affected state, local, and tribal government 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.

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

TO MEET THE INTENT OF EVALUATION CRITERION N.3.c.2, ORO PLANS/PROCEDURES INCLUDE:

- i. The planning process will account for capabilities and activities that may not have the opportunity to be evaluated under the no/minimal radiological release scenario elements; and
- ii. Consideration is given to alternative demonstration and evaluation venues.

EXPLANATION

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. If OROs elect to participate in a joint exercise with a no/minimal radiological release scenario, part of the planning for the exercise will include identifying capabilities and other activities/processes that may not be evaluated under such a scenario and determining appropriate alternative demonstration and evaluation venues so that the OROs have appropriate opportunities to meet their assessment requirements. Planners may not use a “no/minimal release” scenario in consecutive exercises.

Alternative venues could include controller injects during the exercise to drive demonstration of specific response elements; other assessment activities connected to the exercise; or additional activities during the assessment cycle. For example, controller injects or mini scenarios 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, etc.).

REFERENCES

- 10 CFR Part 50, Appendix E, Sec IV.F.
- FEMA Comprehensive Preparedness Guide 101, *Developing and Maintaining Emergency Operations Plans*, Version 2.0, November 2010.

EVALUATION CRITERION N.3.d

Resource Integration. Integration of offsite resources with onsite response.

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

TO MEET THE INTENT OF EVALUATION CRITERION N.3.d, ORO PLANS/PROCEDURES INCLUDE:

- i. A resource integration element is utilized once during each eight-year exercise cycle; and
- ii. This scenario element may be combined with other scenario elements.

EXPLANATION

The resource integration scenario element is utilized once during each eight-year exercise cycle and entails demonstrating the integration of offsite resources with the onsite response efforts. The offsite resources expected to provide support to

the onsite response are identified in agreements and referenced in plans/procedures (see evaluation criteria A.4, C.2.d, J.2, J.5, K.1.f, K.1.g, and O.1.a). Consideration should be given to exercising the training provided, ability to provide just-in-time training, distribution of PPE, dosimetry, and/or site-specific requirements. While commonly combined with the HAB scenario element, this scenario element may be combined with any of the other scenario elements or utilized on its own.

REFERENCES

- FEMA Comprehensive Preparedness Guide 101, *Developing and Maintaining Emergency Operations Plans*, Version 2.0, November 2010.
- 10 CFR Part 50, Appendix E, Section IV.F.

EVALUATION CRITERION N.3.e

10 CFR 50.54(hh)(2) Strategies. Demonstration of the use of equipment, procedures, and strategies developed in compliance with 10 CFR 50.54(hh)(2).

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

EVALUATION CRITERION N.4

Drills are designed to enable an organization's demonstration and maintenance of key skills and capabilities necessary to fulfill functional roles. Drills include, but are not limited to, the following at their noted frequencies:

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

TO MEET THE INTENT OF EVALUATION CRITERION N.4, ORO PLANS/PROCEDURES INCLUDE:

- i. All major elements of plans/procedures are tested at the minimum frequency specified.

EXPLANATION

Plans/procedures address the use of drills to demonstrate OROs' maintenance of the key skills and capabilities necessary to fulfill functional roles regarding response and recovery actions related to an incident at a commercial NPP. Drills augment the exercise program, have a specific focus, and provide opportunities for training and practical application.

The drills and their frequencies are further described in the sub-criteria of this evaluation criterion.

REFERENCES

- Homeland Security Exercise and Evaluation Program (HSEEP), April 2013.

EVALUATION CRITERION N.4.a

Emergency Medical Drills. Emergency medical drills are conducted annually. These drills involve a simulated, contaminated individual and contain provisions for participation by support services agencies (i.e., ambulance and offsite medical treatment facility).

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

EVALUATION CRITERION N.4.b

Medical Services Drills. *Medical services drills are conducted annually at each medical facility designated in the emergency plan. These drills involve a simulated, contaminated emergency worker and/or member of the general public and contain provisions for participation by support services agencies (i.e., ambulance and offsite medical treatment facility).*

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

TO MEET THE INTENT OF EVALUATION CRITERION N.4.b, ORO PLANS/PROCEDURES INCLUDE:

- i. Annual medical services drills are conducted annually at each medical facility identified in the emergency plan.

EXPLANATION

OROs conduct medical services drills to demonstrate that procedures for transporting contaminated, injured individuals to the appropriate medical facility can be implemented and to allow medical facility staff to demonstrate proper care of contaminated, injured individuals at appropriately-equipped facilities. The focus of these drills is contamination control measures, not medical protocols. The exception to this is the modification of contamination control procedures and decisions regarding transportation to a medical facility when the contaminated individual has an urgent medical condition. Plans/procedures state that medical services drills are conducted annually; FEMA evaluates these drills biennially. Non-FEMA evaluated medical services drills are reported in the ALC. Drills may be held in conjunction with the biennial evaluated exercise.

Medical services drills provide the 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, or immediately upon arrival, to the medical facility. If contamination 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.

Additionally, medical emergency drills also provide the opportunity to determine:

- 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 transported to, and ensures that the individual is transported without undue delay;
- Communications are maintained with the receiving medical facility;
- Vehicles and occupants are monitored to detect the nature and extent of radiological contamination and, if necessary, are decontaminated;
- Appropriate staff members are present or available on short notice to support medical facilities;
- The medical facility prepares for arrival of a contaminated, injured individual and sets up appropriate contamination control measures;
- Medical personnel demonstrate the capability to evaluate radiation exposure and uptake;
- 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; and
- Dosimetry procedures are established and implemented.

REFERENCES

- Homeland Security Exercise and Evaluation Program (HSEEP), April 2013.

EVALUATION CRITERION N.4.c

Laboratory Drills. Laboratory drills are conducted biennially at each laboratory designated in the emergency plan. These drills involve demonstration of handling, documenting, provisions for record keeping, and analyzing air, soil, and food samples, as well as quality control and quality assurance processes. These drills also involve an assessment of the laboratory's capacity to handle daily and weekly samples and the volume of samples that can be processed daily or weekly.

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

TO MEET THE INTENT OF EVALUATION CRITERION N.4.c, ORO PLANS/PROCEDURES INCLUDE:

- Laboratory drills are conducted biennially.

EXPLANATION

Plans/procedures state that laboratory drills are conducted biennially. FEMA evaluates laboratory demonstrations once during each eight-year exercise cycle. In accordance with plans/procedures, the following are demonstrated during laboratory drills:

- Sample collection;
- Contamination control while handling samples;
- Prevention of elevation of background;
- Prevention of sample cross-contamination;
- Preservation of samples;
- Sample tracking;
- Sample preparation;
- Sample measurement and analysis; and
- Sample analysis data transmission

All drills are documented and reported in the ALC, along with an equipment list, calibrations, and daily quality assurance/quality control procedures.

When a laboratory is contracted by multiple OROs, the RAC Chair(s) will determine the frequency of the laboratory drill evaluations. When making a determination, the RAC Chair(s) considers contract conditions, differences in operating procedures between the multiple OROs, and performance in previous drills, especially where corrective actions were noted.

REFERENCES

- ANSI N42.14-1999, *Calibration and Use of Germanium Spectrometers for the Measurement of Gamma-Ray Emission Rates of Radionuclides*, May 1999.
- EPA 402-B-04-001A, *Multi-Agency Radiological Laboratory Analytical Protocols Manual*, July 2004.
- SAND2013-10382P, *Federal Radiological Monitoring and Assessment Center Laboratory Analysis Manual*, December 2013.

- FEMA Comprehensive Preparedness Guide 101, *Developing and Maintaining Emergency Operations Plans*, Version 2.0, November 2010.
- Homeland Security Exercise and Evaluation Program (HSEEP), April 2013.

EVALUATION CRITERION N.4.d

Environmental Monitoring Drills. *Environmental monitoring drills are conducted annually. These drills include direct radiation measurements in the environment, collection and analysis of all sample media (e.g., water, vegetation, soil, and air), and provisions for record keeping.*

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

TO MEET THE INTENT OF EVALUATION CRITERION N.4.d, ORO PLANS/PROCEDURES INCLUDE:

- i. Environmental monitoring drills are conducted annually.

EXPLANATION

Plans/procedures state that environmental monitoring drills are conducted annually and reported in the ALC. The environmental monitoring drill may be held in conjunction with an evaluated exercise. These drills include the following activities/capabilities:

- Alert, notification, and mobilization of emergency personnel;
- Establish and maintain communication capabilities with appropriate locations;
- Utilization of necessary equipment and supplies to support emergency operations;
- Collection of sufficient information to help Field Teams (2 or more) characterize the release and control radiation exposure;
- Collection and record keeping of ambient radiation measurements, and radioiodine and particulate samples at appropriate locations;
- Identification of significant radioactivity levels (as specified in plans/procedures) on collected sampling media; and
- Ability to make appropriate measurements and collect samples to support adequate assessments and protective action decision-making.

REFERENCES

- DOE/NV/25946—1558, Vol. 2, *Federal Radiological Monitoring and Assessment Center Monitoring Manual: Radiation Monitoring and Sampling*, July 2012.
- FEMA Comprehensive Preparedness Guide 101, *Developing and Maintaining Emergency Operations Plans*, Version 2.0, November 2010.
- FEMA-REP-2, *Guidance on Offsite Emergency Radiation Measurement Systems, Phase 1 – Airborne Release*, June 1990.
- *Accidental Radioactive contamination of Human Food and Animal Feeds: Recommendations for State and Local Agencies*, April 1998.
- Homeland Security Exercise and Evaluation Program (HSEEP), April 2013.

EVALUATION CRITERION N.4.e

Ingestion Pathway and Post-Plume Phase Drills. *Ingestion pathway and post-plume phase drills are conducted biennially. These drills involve sample plan development, analysis of lab results from samples, assessment of the impact on food and agricultural products, protective decisions for relocation, and food/crop embargos.*

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

TO MEET THE INTENT OF EVALUATION CRITERION N.4.e, ORO PLANS/PROCEDURES INCLUDE:

- i. Ingestion pathway drills are conducted biennially; and
- ii. Participants include any OROs that have roles/responsibilities for the ingestion pathway and/or post-plume phase activities.

EXPLANATION

Plans/procedures state that ingestion pathway and post-plume phase drills are conducted biennially and reported in the ALC. The ingestion pathway and post-plume phase drill may be held in conjunction with an evaluated exercise.

Participation is not limited to state OROs and includes any OROs, state or local, that have roles/responsibilities for the ingestion pathway and/or post-plume phase activities. Participation may be rotated according to drill objectives (i.e., not all ingestion pathway/post-plume phase objectives are relevant to all OROs) and/or so that the amount of OROs participating is adequate to meet the drill objectives. However, all OROs that have roles/responsibilities for the ingestion pathway and/or post-plume phase activities, no matter how small, will participate in at least one drill during each eight-year exercise cycle.

The intent of these drills are to train, practice, validate, and maintain skills with regard to ingestion pathway and/or post-plume phase activities. As such, these drills involve, at least the following activities during each eight-year exercise cycle:

- Sample plan development;
- Analysis of lab results from samples;
- Assessment of the impact on foodstuffs and agricultural products;
- Protective decisions for reentry, relocation, return, and reoccupancy;
- Foodstuffs/crop embargo;
- Dissemination of ingestion exposure pathway EPZ information to pre-determined individuals and business;
- Assessment of emergency worker knowledge of ingestion exposure pathway EPZ procedures; and
- Identification of the individual authorized to make decisions in the ingestion exposure pathway EPZ.

REFERENCES

- FEMA Comprehensive Preparedness Guide 101, *Developing and Maintaining Emergency Operations Plans*, Version 2.0, November 2010.
- *Homeland Security Exercise and Evaluation Program (HSEEP)*, April 2013.

EVALUATION CRITERION N.4.f

Communications Drills. *Communications amongst and between emergency response organizations, including those at the state, local, and Federal level, the FMTs, and nuclear facility within both the plume and ingestion exposure pathway EPZs, are tested at the frequencies determined in evaluation criterion F.3. Communications drills include the aspect of understanding the content of messages and can be done in conjunction with the testing described in evaluation criterion F.3.*

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

TO MEET THE INTENT OF EVALUATION CRITERION N.4.f, ORO PLANS/PROCEDURES INCLUDE:

- i. Communications drills between all applicable emergency response organizations within the plume and ingestion exposure pathway EPZs are conducted at the frequencies determined in evaluation criterion F.3; and
- ii. A message content check is included in all communications drills.

EXPLANATION

OROs test communications with all emergency response organizations that have assigned roles and responsibilities in the emergency response. Communications drills are conducted at the frequencies determined within evaluation criterion F.3 as part of the overall testing of communications systems/equipment. At a minimum, drills should occur monthly between all applicable organizations within the plume exposure pathway EPZ and, if applicable, quarterly between states within the ingestion pathway EPZ.

These drills address two aspects: (1) that the communications hardware is functioning properly and (2) messages, likely to be transmitted during an emergency, will be understood by the receiving organizations. Communications drills are structured to include a “content check” using actual messages or notifications that would be sent during an emergency.

Notification of an emergency generally originates with the licensee and then “fans out” to OROs, who then notify their component agencies and support organizations. For communications drills that are structured to maintain proficiency of the initial notification process, it is recommended OROs conduct communications drills at varying times in an effort to conduct a drill during all work shifts (i.e., first shift, second shift, and third shift) to ensure all personnel at the initial warning point are familiar with the process of the initial notification. Drills should be conducted such that the verification of message, if required by plans/procedures, and notification capability are validated.

The only communication drills with Federal agencies that need to be performed are with those noted in the plans/procedures. Any issues that OROs are experiencing with Federal communication drills should be brought to the attention of the FEMA Regional Administrator.

REFERENCES

- FEMA Comprehensive Preparedness Guide 101, *Developing and Maintaining Emergency Operations Plans*, Version 2.0, November 2010.
- Homeland Security Exercise and Evaluation Program (HSEEP), April 2013.

EVALUATION CRITERION N.4.g

Post-Accident Sampling Drills. *Post-accident sampling drills are conducted annually. These drills address capabilities including analysis of liquid and containment atmosphere samples with simulated elevated radiation levels. This criterion is not applicable if the NPP unit(s) does (do) not have licensing basis requirements for post-accident sampling.*

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

EVALUATION CRITERION N.4.h

Off-Hours Report-In Drills. *Off-hours report-in drills are conducted biennially and are unannounced.*

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

EVALUATION CRITERION N.4.i

Off-Hours Call-In Drills. *Off-hours call-in drills are conducted quarterly, such that each ERO member's normally expected response time is assessed at least biennially based on call-in drill responses or an alternate means for determining response time. Some drills are unannounced.*

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

EVALUATION CRITERION N.4.j

Onsite Personnel Protective Action Drills. *Onsite personnel protective action drills are conducted during every eight-year exercise cycle. These drills demonstrate the NPP site's ability to implement and coordinate protective actions for onsite personnel during hostile action.*

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

EVALUATION CRITERION N.4.k

Aircraft Threat/Attack Response Drills. *Aircraft threat/attack response drills are conducted during every eight-year exercise cycle. These drills demonstrate the use of procedures and protective measures developed for responding to hostile action involving an aircraft threat or attack.*

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

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.

EVALUATION CRITERION O.1

Each organization ensures the training of emergency responders and other appropriate individuals with an operational role described in the emergency plan. Initial training and at least annual retraining are provided.

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

TO MEET THE INTENT OF EVALUATION CRITERION O.1, ORO PLANS/PROCEDURES INCLUDE:

- i. The organization(s) or individual(s) responsible for ensuring training requirements are met, including a description of their responsibilities;
- ii. Provisions to ensure personnel with an operational role receive appropriate training;
- iii. A description of training programs, including scope, time intervals at which training will be offered, and organization(s) that will provide training assistance;
- iv. Identification of mutual aid organizations and applicable arrangements for offering or receiving training;
- v. Provisions for initial training;
- vi. Provisions for at least annual retraining;
- vii. Provisions for just-in-time training; and
- viii. Documentation of attendance for training.

EXPLANATION

Plans/procedures specify the organization(s) or individual(s) responsible for ensuring radiological-specific and other relevant emergency response training requirements are met, including a description of their responsibilities (e.g., who is responsible for scheduling, conducting, and documenting trainings; answering training-related inquiries; etc.). The plans/procedures also state that the specified organizations ensure appropriate personnel designated to support radiological emergency response operations (e.g., the individuals identified in evaluation criterion A.3) participate in appropriate Federal- and state-sponsored training courses. If applicable, plans/procedures specify which organizations include radiological emergency response training as a part of their fire, police, hospital/medical facility, and ambulance/rescue training.

Below is a sample list of individuals who may have an operational role and need radiological emergency response training:

- Directors or coordinators of the response organizations;
- Personnel responsible for accident assessment;
- Radiological monitoring teams and radiological analysis personnel;
- Police, security, and fire-fighting personnel;
- 911 dispatchers/initial notification call-in centers;
- First aid and rescue personnel;
- Local support services personnel including emergency management/EMS personnel;
- Medical support personnel;

- Licensees' headquarters support personnel;
- Licensees' repair and damage control/corrective action teams; and
- Personnel responsible for transmission of emergency information and instructions.

The ORO's training program is described in the plans/procedures, including the scope of their training program (e.g., lesson outlines or a training matrix³⁶), time intervals at which training programs will be offered, and if applicable, organization(s) that will provide training assistance. Training should be commensurate with emergency response role, topics may include procedures for initial notification, basic radiation protection, dosimetry and KI use, ICS, use of traffic and access control (TAC), review of evacuation routes, and expected roles. Where mutual aid agreements exist with other response organizations (e.g., fire, police, hospital/medical facilities, etc.), plans/procedures identify those mutual aid organization(s) and specify training arrangements for who is to conduct and receive training.

Training programs include provisions for initial, annual retraining (at a minimum), and just-in-time training (i.e., instructions provided to personnel immediately prior to performing the assigned task). Plan/procedures include just-in-time training to mutual aid organizations, as appropriate and applicable to the support they will provide; for example, providing just-in-time training on basic radiation protection to supplementary incoming mutual aid firefighters.

Documentation of training attendance are described in the plans; this includes attendance rosters, and evaluation of results (if applicable), or other effective means to document training for individuals.

REFERENCES

- FEMA Comprehensive Preparedness Guide 101, *Developing and Maintaining Emergency Operations Plans*, Version 2.0, November 2010.
- *National Incident Management System*, Third Edition, October 2017.
- *Nuclear/Radiological Incident Annex to the Response and Recovery Federal Interagency Operational Plans*, October 2016.

EVALUATION CRITERION O.1.a

Site-specific emergency response training is developed and conducted for those offsite organizations that may be called upon to provide onsite assistance in the event of an emergency.

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

EVALUATION CRITERION O.2

The ERO training program consists of learning objectives that are used to develop and maintain key skills. This includes a systematic analysis of jobs and tasks to be performed from which learning objectives are derived.

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

³⁶ A training matrix may simply include a list and brief summaries of all radiological training courses, or may also incorporate the organizations requiring training and the type of training they require.

EVALUATION CRITERION 0.2.a

The ERO training program is reviewed at least annually and revised as necessary.

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

EVALUATION CRITERION 0.2.b

Training sessions that provide performance opportunities to develop, maintain, or demonstrate key skills are critiqued in order to identify weak or deficient areas that need correction.

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

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.

EVALUATION CRITERION P.1

The training program, including initial training and periodic retraining, of individuals responsible for the planning effort is described.

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

TO MEET THE INTENT OF EVALUATION CRITERION P.1, ORO PLANS/PROCEDURES INCLUDE:

- i. The individual(s), by title/position, that require training because of their planning responsibilities; and
- ii. A description of the initial and recurrent training program for the identified individuals.

EXPLANATION

Plans/procedures specify the individual(s), by title/position, with planning responsibilities (e.g., county emergency planners) and whom require training. This includes, at a minimum, the individuals described in evaluation criteria P.2 and P.3.

Plans/procedures describe provisions for initial and recurrent training, including the periodicity of recurrent training which should occur at least annually. The recurrent training is intended for applicable individuals to remain proficient on current guidance and requirements of radiological incident planning.

The training format and source(s) are described in the OROs' plans.

REFERENCES

- FEMA Comprehensive Preparedness Guide 101, *Developing and Maintaining Emergency Operations Plans*, Version 2.0, November 2010.
- *National Incident Management System*, Third Edition, October 2017.

EVALUATION CRITERION P.2

The individual with the overall authority and responsibility for radiological emergency planning is identified by title/position.

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

TO MEET THE INTENT OF EVALUATION CRITERION P.2, ORO PLANS/PROCEDURES INCLUDE:

- i. The individual(s), by title/position, with the overall authority and responsibility for radiological emergency response planning.

EXPLANATION

Plans/procedures specify the individual(s), by title/position, with the overall responsibility and authority for radiological emergency response planning. This position is the legally designated authority responsible for radiological emergency preparedness and response planning (e.g., a senior elected official), and may or may not be the same position with operational responsibility.

REFERENCES

- FEMA Comprehensive Preparedness Guide 101, *Developing and Maintaining Emergency Operations Plans*, Version 2.0, November 2010.
- National Incident Management System, Third Edition, October 2017.

EVALUATION CRITERION P.3

The individual(s) with the responsibility for the development, maintenance, review, updating, and distribution of emergency plans, as well as the coordination of these plans with other response organizations, is identified by title/position.

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

TO MEET THE INTENT OF EVALUATION CRITERION P.3, ORO PLANS/PROCEDURES INCLUDE:

- The individual(s), by title/position, responsible for developing, maintaining, reviewing, updating, and distributing emergency plans/procedures, as well as coordinating plans/procedures with other response organizations.

EXPLANATION

Plans/procedures specify the individual(s), by title/position, for developing, maintaining, reviewing, updating, and distributing emergency plans/procedures, as well as coordinating such plans/procedures with other response organizations (e.g., the county emergency planning coordinator). At a minimum, this includes those responsible for the processes described in evaluation criteria P.4, P.5, and P.10. This may be the same individual(s), by title/position identified under evaluation criterion P.2.

REFERENCES

- FEMA Comprehensive Preparedness Guide 101, *Developing and Maintaining Emergency Operations Plans*, Version 2.0, November 2010.
- National Incident Management System, Third Edition, October 2017.

EVALUATION CRITERION P.4

The process for reviewing annually, and updating as necessary, the emergency plan, implementing procedures, maps, charts, and agreements is described. The process includes a method for recording changes made to the documents and, when appropriate, how those changes are retained.

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

TO MEET THE INTENT OF EVALUATION CRITERION P.4, ORO PLANS/PROCEDURES INCLUDE:

- A description of the process for reviewing annually, and updating as necessary, the emergency plan, implementing procedures, maps, charts, and agreements;
- A method to indicate where and when the most recent plans/procedures changes were made;
- A method to indicate how plan/procedure changes are retained and historical context preserved;
- The process for correcting identified findings and plan issues; and
- Acknowledgment/documentation that plans/procedures and agreements have been reviewed for accuracy and completeness of information, and when appropriate, changes have been made, within the last year.

EXPLANATION

A general description of the process for reviewing annually, and updating as necessary, the emergency plan, implementing procedures, maps, charts, and agreements is included in plans/procedures. The description includes the following:

- **Method for indicating recent changes:** OROs identify a method to indicate where, and what date, changes were implemented. It is preferred for OROs to use visual representation of where recent changes were made, (e.g., via change bars, track changes, etc.). However, when recent changes are so numerous or extensive that change bars are impractical, OROs may provide a list or summary of changes.
- **Method for retaining changes:** In an effort to retain and preserve changes previously implemented, OROs provide a history of plan/procedures revisions and briefly describe why and when a change was made. For example, OROs could implement a Record of Changes or other log book method to record updates for reference and historical context. The purpose here is to capture why a change was initially made and to provide historical context for consideration as new changes are contemplated and/or made; much of this is in effort to provide context for historical changes and preserve intent of the changes.
- **Process for correcting identified findings and plan issues:** Plan issues may arise as ORO capabilities are tested, thus requiring plans/procedures to be updated periodically to correct identified issues. Corrective actions identified in After Action Reports (AARs)/Improvement Plans (IPs), or through other means, are to be incorporated and documented.
- **Any special considerations for reviewing/updating maps, charts, and agreements:** The annual review process should address maps, charts, and agreements within, or referenced by, the plans/procedures and set an appropriate review/update schedule to ensure that all, but maps in particular, reflect the latest data available (e.g., census data, state and county records, etc.). Any special considerations for the unique needs of maps, charts, and agreements not covered within the components above should also be addressed.

The methods and processes described above are also applicable when updating organizational procedures, including instances where a sub-organization (e.g., a school district, hospital/medical facility) has the responsibility to update their own procedures, as well as ingestion exposure pathway information in plans/procedures (e.g., applicable maps such as maps of farming, dairies, foodstuffs processing plants, water sheds, etc.; ingestion exposure pathway protective measures; contact and location lists of foodstuffs processing facilities within the ingestion exposure pathway EPZ; etc.). For protective action information for the ingestion exposure pathway EPZ, refer to evaluation criterion J.12.

A review of ORO plans/procedures, maps, charts, and agreements is conducted at least annually to verify accuracy and completeness, and to ensure appropriate changes have been made within the last year. Documentation of this review, such as a signature page that certifies that the review occurred, is submitted to the FEMA Regional Administrator by the state as part of the ALC process. For additional ALC information, refer to Part IV, Section N of this Manual.

REFERENCES

- FEMA Comprehensive Preparedness Guide 101, *Developing and Maintaining Emergency Operations Plans*, Version 2.0, November 2010.
- National Incident Management System, Third Edition, October 2017.

EVALUATION CRITERION P.5

Provisions for distributing the emergency plan and implementing procedures to all organizations and appropriate individuals with responsibility for implementation of the plan/procedures are described.

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

TO MEET THE INTENT OF EVALUATION CRITERION P.5, ORO PLANS/PROCEDURES INCLUDE:

- i. A list of the organizations and individuals, by title/position, who are to receive the updated plans/procedures;
- ii. The process for distributing the latest plans/procedures to appropriate organizations and individuals; and
- iii. A process to verify that updated plan/procedures have been received.

EXPLANATION

Plans/procedures describe the process for distributing the updated plans/procedures. This description includes:

- A list of organizations and individuals, by title/position, who are to receive updated plan/procedures. This list should include as appropriate, organizations and individuals that comprise the overall response for both plume and ingestion exposure pathway EPZs (as identified under evaluation criterion A.1), those with responsibility for specific functions (as identified under evaluation criterion A.3), and/or those support organizations with written agreements to provide an emergency response role (as identified under evaluation criterion A.4). Discretion should be used when providing the updated plans/procedures as FEMA recognizes that not every organization or individual needs the entire set of plans/procedures.
- The method(s) of distribution of the updated plans/procedures (e.g., email, hand delivery, etc.).
- A process to verify updated plans/procedures have been received. For example, a quarterly coordination call where all organizations/individuals verbally confirm that they received the updated plans/procedures or an email that verifies receipt.

REFERENCES

- FEMA Comprehensive Preparedness Guide 101, *Developing and Maintaining Emergency Operations Plans*, Version 2.0, November 2010.
- National Incident Management System, Third Edition, October 2017.

EVALUATION CRITERION P.6

A listing of annexes, appendices, and supporting plans and their originating agency is included in the emergency plan.

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

TO MEET THE INTENT OF EVALUATION CRITERION P.6, ORO PLANS/PROCEDURES INCLUDE:

- i. A list of annexes, appendices, and supporting plans; and
- ii. Originating agency for each listed annex, appendix, and support plan.

EXPLANATION

The emergency plan, as applicable, includes a list of annexes, appendices, and supporting plans, including the originating agency. For example, this may include other organizations' emergency response plans/procedures that are referenced or otherwise support implementation such as those at the municipal-level or those from school districts or hospital/medical

facilities, or jurisdictions with OROs beyond the 10-mile as it relates to the ingestion exposure pathway and post-plume phase activities.

REFERENCES

- FEMA Comprehensive Preparedness Guide 101, *Developing and Maintaining Emergency Operations Plans*, Version 2.0, November 2010.
- National Incident Management System, Third Edition, October 2017.

EVALUATION CRITERION P.7

An appendix containing a listing by title of the procedures required to maintain and implement the emergency plan is included. The listing includes the section(s) of the emergency plan to be implemented by each procedure.

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

TO MEET THE INTENT OF EVALUATION CRITERION P.7, ORO PLANS/PROCEDURES INCLUDE:

- i. A list of all implementing procedures associated with the emergency plan; and
- ii. Identification of 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

- FEMA Comprehensive Preparedness Guide 101, *Developing and Maintaining Emergency Operations Plans*, Version 2.0, November 2010.
- National Incident Management System, Third Edition, October 2017.

EVALUATION CRITERION P.8

A table of contents and a cross-reference index to each of the NUREG-0654/FEMA-REP-1, Rev.2 evaluation criteria are included. The evaluation criteria that do not apply are identified.

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

TO MEET THE INTENT OF EVALUATION CRITERION P.8, ORO PLANS/PROCEDURES INCLUDE:

- i. A table of contents; and
- ii. A cross-reference between the plans/procedures and the NUREG-0654/FEMA-REP-1, Rev. 2 evaluation criteria.

EXPLANATION

Plans/procedures contain a table of contents and cross-reference of the plans/procedures to the NUREG-0654/FEMA-REP-1, Rev. 2 evaluation criteria. The NUREG-0654/FEMA-REP-1, Rev. 2 cross-reference table should address each evaluation criterion and provide references to specific subparts of the plans/procedures. The cross-references should be as specific as possible to allow planners and reviewers to quickly locate the relevant information. The cross-reference should also clearly indicate which evaluation criteria, if any, do not apply.

A detailed cross-reference eases the reviewing and updating of the plans/procedures by ensuring that information similar in nature is updated together, helping to avoid updating information in one section of the plans/procedures but not in another.

REFERENCES

- FEMA Comprehensive Preparedness Guide 101, *Developing and Maintaining Emergency Operations Plans*, Version 2.0, November 2010.

EVALUATION CRITERION P.9

Provisions for addressing the requirements of 10 CFR 50.54(t) are described.

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

EVALUATION CRITERION P.10

The administrative process for the periodic review and updating of contact information identified in the emergency plan and implementing procedures is described.

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

TO MEET THE INTENT OF EVALUATION CRITERION P.10, ORO PLANS/PROCEDURES INCLUDE:

- i. The process for reviewing and updating contact information.

EXPLANATION

Plans/procedures describe the administrative process for reviewing and updating contact information in both the emergency plan and implementing procedures. There are many ways to accomplish this, the update function may be centralized or different sub-organizations may be responsible for updating their own information. Quarterly updates of contact information do not need to involve physical replacement of procedure pages if there are no changes; the objective is to ensure that the responsible individual(s) checks quarterly to verify if contact information has changed and to update when necessary. If contact information does not require any updates, a confirmation of no changes is provided.

REFERENCES

- FEMA Comprehensive Preparedness Guide 101, *Developing and Maintaining Emergency Operations Plans*, Version 2.0, November 2010.

EVALUATION CRITERION P.11

The process for entering EP program-related issues that could reduce the effectiveness of the emergency plan into the site-wide corrective action program is described.

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

EVALUATION CRITERION P.12

The process to evaluate changes in plant configuration for their impact on the effectiveness of the emergency plan is described.

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

PART III: REP Program Assessment Policies and Guidance

A. INTRODUCTION

In this Part of the RPM, FEMA provides guidance for REP controllers, evaluators, and those responsible for planning, preparing, and executing REP assessment activities.

1. Contents and Organization

In addition to this introduction, Part III has two subparts:

- **Subpart B, REP Assessment Policies and Process**, identifies the unique regulatory requirements of the REP Program that affect the scheduling, design and development, evaluation, and improvement planning associated with the assessment activities. This subpart also explains the process for requesting and receiving REP assessment activity credit.
- **Subpart C, REP Objectives and Capability Targets**, describes the common metrics used to evaluate a REP Program assessment activity during the biennial assessment period in terms of objectives, capability targets, and core capabilities. The objectives/capability targets are derived from the planning standards of 44 CFR 350, support the evaluation criteria from NUREG-0654/FEMA-REP-1, Rev. 2, and are used as the baseline for assessing ORO preparedness in terms of core capabilities.

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 two components: (1) adequate plans/procedures and, (2) the implementation of those plans/procedures. OROs use exercises, drills, seminars, training, SAVs, plan reviews, the ALC process, and actual incidents to practice plan/procedure implementation. FEMA observes or uses records of ORO activities to fulfill its responsibility to assess the adequacy of offsite response.

FEMA uses a set of programmatic-specific objectives/capability targets and associated core capabilities as a minimum baseline for assessment. FEMA reports out on the overall state of preparedness biennially in the Biennial Preparedness Report at the conclusion of a given biennial assessment period. The biennial assessment period generally coincides with the 2-year exercise cycle. REP exercises verify the ability of OROs to implement various aspects of their plans/procedures and demonstrate their preparedness. Within the REP Program, the regulations at 44 CFR 350 place an expectation on OROs to possess the needed capabilities that support the intent of the planning standards. FEMA focuses its assessment on these capabilities, thus ensuring the planning standards are met.

For physical demonstrations, such as exercises and drills, the HSEEP methodology is utilized to plan and execute these activities. Integration with HSEEP concepts does not establish additional exercise requirements for the REP Program nor does it replace existing REP Program requirements, such as the planning standards.

B. REP ASSESSMENT POLICIES AND PROCESS

This subpart identifies the unique regulatory requirements of the REP Program that affect the scheduling, design and development, evaluation, and improvement planning associated with the assessment activities. This section also explains the process for requesting and receiving assessment credit for participating in alternative demonstration activities, such as exercises and drills outside of the REP Program and actual incidents.

1. Biennial Assessment

FEMA validates reasonable assurance by evaluating offsite radiological emergency preparedness through specific objectives/capability targets that meet the intent of the planning standards of 44 CFR 350 and support the assessment of core capabilities. FEMA assesses preparedness on an ongoing basis and reports out on the overall state of preparedness biennially, in the Biennial Preparedness Report, which concludes the biennial assessment period. FEMA uses three principal products to assist in its assessment:

(1) Work Plan

The work plan is a FEMA-developed product that includes ORO input. This jointly-developed assessment strategy guides all the activities to be evaluated throughout the biennial assessment period. The work plan describes which objectives/capability targets will be assigned to each activity and which core capabilities will be assessed by each capability target. The work plan also identifies any alternative opportunities for evaluation of objectives/capability targets. When alternative opportunities are identified, consideration should be given to what activities may still need to be performed by the ORO to ensure that others can achieve appropriate level of participation throughout the biennial assessment period. The work plan guides the overall assessment of preparedness by core capabilities and the results of those assessments ultimately build the Biennial Preparedness Report. The work plan should be considered a tool for use at the most appropriate Training and Exercise Planning Workshop (TEPW) with the goal of having the assessment activities included within the most appropriate Training and Exercise Plan (TEP).

(2) Evaluation Reports

Evaluation reports are FEMA-developed products that include ORO input as appropriate. These assessment activity-specific reports document the findings of the various assessment activities evaluated by the objectives/capability targets throughout the biennial assessment period, and may include recommendations for improvement. AARs are one example and are used to document exercises and drills. The ALC and its associated materials are another example. The depth and detail of these reports is determined by the RAC Chair. The evaluation reports are used to inform the Biennial Preparedness Report and provide documentation for each assessment activity.

(3) Biennial Preparedness Report

The Biennial Preparedness Report is a FEMA-developed product that includes ORO input as appropriate. This report describes the overall assessment of offsite preparedness by core capabilities for the entire biennial assessment period; essentially a compilation of the evaluation reports. This report provides a larger view of ORO preparedness which meets the intent of the 44 CFR 350 planning standards and, through the assessment of selected core capabilities, the National Preparedness Goal. The Biennial Preparedness Report provides valuable information for Federal, state, tribal, and local organizations by documenting the assessment of selected core capabilities in a common language across the REP Program, aiding in the identification of trends, recognition of best practices, and areas for program enhancement. Providing this level of assessment will support communities in their building and sustainment of radiological hazard-specific capabilities. As such, Biennial Preparedness Reports are designed to meet varying levels of sensitivity so portions not intended for public disclosure can be separated and protected. Unplanned activities not captured in the work plan and occurring within a given biennial assessment period (e.g., DIRs, credit for actual incidents) are also reported in the Biennial Preparedness Report to ensure a complete picture.

2. Scheduling REP Program Assessment Activities

The scheduling of REP Program assessment activities, including identifying alternative assessment opportunities outside of the REP Program, should be done in coordination with all relevant OROs and the appropriate FEMA Region(s) and be included in the work plan. By coordinating the scheduling of REP Program assessment activities there is opportunity to increase efficiency with other HSEEP activities. OROs may identify opportunities to demonstrate other NEP exercise activities at a REP exercise or other assessment activities.

a. Assessment Activities

FEMA's planning and preparedness assessment strategy uses a combination of exercises, drills, training, SAVs, and other forms of reporting to ensure that offsite planning and preparedness remains adequate to protect the health and safety of the public. The activity types described here include the variety of modes available for demonstration and assessment of REP planning and preparedness.

(1) Plan Reviews

ORO and FEMA Regions review offsite plans/procedures annually for consistency, and the OROs make revisions when necessary. This assessment activity utilizes the Plan Review Checklist, discussed further in Part IV, Section J, and is available for download from the [REPP RPM Implementation Community](#) within the PrepToolkit. OROs and the Region should jointly decide on the need to test new procedures before adoption and incorporate that activity into the biennial assessment period.

(2) Annual Letter of Certification (ALC)

Several periodic reporting requirements for the REP Program are addressed by the submittal of the ALC, such as the 24-hour staffing requirement under planning standard A, the accomplishment of drills required by planning standard N and not evaluated by FEMA, and the training requirements under planning standard O. Many of these requirements are not easily demonstrated and therefore are assessed through the ALC process. More in-depth guidance regarding the ALC process is provided in Part IV, Section L and the ALC Checklist is available for download from the [REPP RPM Implementation Community](#) within the PrepToolkit.

(3) Public Information Review

Public information materials are reviewed both during the ALC process and prior to distribution to determine whether information and emergency instructions have been included and disseminated pursuant to laws and regulations, FEMA Headquarters and Regional policy determinations, the RPM, and the REP series documents. Emergency information and instructions contained in the public information materials are compared to ORO plans/procedures for consistency and accuracy utilizing the Public Information Review Guide. More information can be found in Part IV, Section M. The Public Information Review Guide is available for download from the [REPP RPM Implementation Community](#) within the PrepToolkit.

(4) Exercises

Exercises are an instrument to train for, assess, practice, and improve performance of prevention, protection, mitigation, response, and recovery capabilities. Exercises can be used for testing and validating policies, plans, procedures, training, equipment, and interagency agreements; clarifying and training personnel in roles and responsibilities; improving interagency coordination and communications; improving individual performance; identifying gaps in resources; and identifying opportunities for improvement. Exercises within the REP Program are required by 44 CFR 350, as is the evaluation by qualified, FEMA evaluators. The REP Program exercises traditionally provide the best opportunity to assess the implementation of OROs' plans and preparedness. This assessment activity is documented in an AAR, a template for which is available for download from the [REPP RPM Implementation Community](#) within the PrepToolkit. Additional guidance regarding exercises can be found throughout this Part and Part IV, Section D Milestones for the REP Exercise Process provides a time frame for completing exercise development, conduct, evaluation, and reporting activities.

Full Participation Exercise. A full participation exercise, typically referred to as the biennial exercise, is a REP Program-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 incident scenario; (2) the integrated capability to adequately assess and respond to an incident at a commercial NPP is tested; and (3) the implementation of the observable portions of state, local, and/or tribal plans are tested. Full participation exercises must occur at least biennially.³⁷

Alternative REP Demonstrations. FEMA will consider the demonstration and assessment of REP Program objectives/capability targets during exercises and drills outside of the REP Program. FEMA and OROs will work to jointly identify, negotiate, and document such opportunities in the work plan. OROs may still have to perform certain demonstrations or other functions to ensure that others can achieve appropriate level of participation throughout the biennial assessment period

(5) Drills

Under NUREG-0654/FEMA-REP-1, Rev. 2 evaluation criterion N.4, OROs conduct drills to demonstrate and maintain key skills and capabilities necessary to fulfill functional roles. Evaluation criteria N.4.b, N.4.c, N.4.d, N.4.e, and N.4.f establish the specific types of drills and their frequency. OROs are not limited to these types of drills, as they represent only the minimum drills to be completed during the biennial assessment period. Wherever practicable, drills provide an efficient means of evaluating capability, particularly for technical proficiency. This assessment activity is documented in an AAR, a template for which is available for download from the [REPP RPM Implementation Community](#) within the PrepToolkit.

(6) 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 evaluate proficiency, wherever possible. Traditionally these assessment activities are captured through completion of the ALC Checklist but can also be addressed through a generic evaluation report, templates for both are available for download from the [REPP RPM Implementation Community](#) within the PrepToolkit.

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 to be part of the evaluation.

(7) 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, verification of training courses delivered). This assessment activity is documented in a generic evaluation report, a template for which is available for download from the [REPP RPM Implementation Community](#) within the PrepToolkit.

³⁷ However, states 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. When not fully participating in an exercise at a site, the state shall partially participate at that site to support the full participation of appropriate local governments. Priority shall be given to new facilities seeking an operating license from the NRC and which have not fully participated in a joint exercise involving the state, local governments, and the licensee at that site. State and local governments will coordinate the scheduling of these exercises with the appropriate FEMA and NRC Regional Offices and the affected licensees.

(8) Actual Incidents

Responses to actual incidents can be used to validate objectives/capability targets during the biennial assessment period. If time permits, a FEMA representative may deploy to the location during the event to observe. Otherwise, the OROs may submit a request for REP Program evaluation credit to the FEMA Region according to the process described in Section 6 of Part III.B. In either case, this assessment activity is documented in a generic evaluation report, a template for which is available for download from the [REPP RPM Implementation Community](#) within the PrepToolkit.

(9) Preliminary Capabilities Assessments (PCAs) and Disaster-Initiated Reviews (DIRs)

FEMA works with OROs to conduct DIRs to evaluate the state of offsite emergency response infrastructure and functions following a disaster that affects the population within the plume exposure pathway EPZ (e.g., hurricanes, earthquakes, flooding, severe weather, etc.). This review is provided to the NRC to assist in their decision to allow the NPP to continue operating or to restart in cases where the NPP has performed a precautionary shutdown in response to the disaster. This assessment activity is documented in the completion of the PCA checklist and/or the Post-Disaster Assessment of Offsite Capabilities checklists that can be found within the Interim SOG “Assessment of Offsite Emergency Preparedness Infrastructure and Capabilities Following an Incident in the Vicinity of a U.S. Nuclear Regulatory Commission-Licensed Nuclear Power Plant” which is available for download from the FEMA Library, accessible through the FEMA THD webpage.

b. Biennial Assessment Period Requirements

Per 44 CFR 350, FEMA is responsible for the review and approval of state and local emergency plans and preparedness for the offsite effects of a radiological emergency which may occur at a commercial nuclear power facility. Under 44 CFR 350.5(a), FEMA is directed to utilize the planning standards and evaluation criteria contained in NUREG-0654/FEMA-REP-1, Rev. 2 to review and evaluate state and local government radiological emergency plans and preparedness. And finally, in 44 CFR 350.9(c), the frequencies of demonstrations/evaluations are established for all observable aspects of the planning standards and related NUREG-0654/FEMA-REP-1, Rev. 2 evaluation criteria on a biennial cycle, which would include the ingestion exposure pathway portions to be evaluated once within the established 8-year exercise cycle.

In order to ease tracking and completion of this biennial requirement, FEMA has organized the observable portions of the planning standards into objectives/capability targets. At a minimum, all of the objectives/capability targets are required through 44 CFR 350 to be demonstrated and evaluated biennially. However, FEMA is committed to providing opportunities for innovative and efficient demonstration and evaluation. The following table represents programmatic recommendations on how to accomplish the demonstration and evaluation of each of the objectives/capability targets within the 2-year exercise cycle. During development of the work plan, the site specialist and relevant OROs should determine the demonstration frequency and activities for each objective/capability target. The RAC Chair will be the ultimate decision-maker when it comes to finalizing the work plan and approving the extent-of-play agreements.

Credit for evaluation opportunities at activities other than exercises and drills (i.e., actual incidents, trainings, seminars, SAVs) should be considered as acceptable means for accomplishing each of the objectives/capability targets, though provision of credit is ultimately at the discretion of the RAC Chair.

Exhibit III-1 provides a crosswalk between the objectives/capability targets and NUREG-0654/FEMA-REP-1, Rev. 2 evaluation criteria and identifies the recommended frequency for evaluation of each objective/capability target.

Exhibit III-1: REP Assessment Process Matrix

Objectives and Capability Targets	NUREG-0654/FEMA-REP-1, Rev. 2 Evaluation Criteria	Recommended Evaluation Frequencies	Recommended Assessment Activities
Objective 1: Emergency Operations Management			
Capability Target 1.1: Mobilization			
Individuals with roles in support of emergency operations are identified, alerted, and mobilized in a timely manner.	A.1, A.1.a, A.1.b, A.3, A.4, A.5, C.1, C.2, C.2.a, C.2.b, C.3, E.1, E.1.a, E.3, F.1.c, H.6, O.1	At every assessment activity	Exercise; Drill
Capability Target 1.2: Direction and Control			
Individuals in leadership roles provide direction and control to the portion of the overall response effort for which they are responsible.	A.1, A.1.a, A.1.b, A.1.c, A.2, A.3, A.5, C.2, C.2.a, C.2.b, C.3, D.4, E.1, H.6, O.1	At every assessment activity	Exercise; Drill
Capability Target 1.3: Protective Action Recommendations			
Appropriate PARs are selected based on available information and other factors.	D.4, J.7, J.8, J.8.b, J.9, O.1	Biennially	Biennial exercise only
Capability Target 1.4: Protective Action Decisions for the Plume Phase			
Appropriate PADs are based on available information for the plume phase.	D.1.b, D.4, J.6, J.7, J.8, J.8.b, J.10, J.10.a, J.10.b, J.11.c-g, O.1	Biennially	Biennial exercise only
Capability Target 1.5: Protective Action Decision Implementation for the Plume Phase			
Implement decisions for those populations and areas subject to plume phase protective actions.	A.4, C.2.a, G.1, J.11, J.11.a, J.11.b, J.11.c, J.11.e, J.11.g, O.1	Biennially	Exercise; Drill
Capability Target 1.6: Protective Action Decisions for the Post-Plume Phase			
Appropriate PADs are based on available information for the post-plume phase.	J.12, J.14, J.14.a-f, M.1, M.1.b, M.4, M.5, M.6, M.7, M.8, O.1	At least once every 8-years	Exercise; Drill
Capability Target 1.7: Protective Action Decision Implementation for the Post-Plume Phase			
Implement decisions for those populations and areas subject to post-plume phase protective actions.	C.2, J.12, J.14, J.14.a-f, M.1, M.1.b, M.4, M.5, M.6, M.7, M.8, O.1	Biennially	Exercise; Drill
Objective 2: Exposure Control			
Capability Target 2.1: Emergency Worker Exposure Control Decision-Making Process			
A decision-making process involving consideration of appropriate factors and necessary coordination is used to ensure that an exposure control system is in place for emergency workers, and includes the use of radioprotective drugs and procedures to authorize emergency exposures in excess of the PAGs.	C.2.c, H.11, K.2, K.2.b, K.3, K.3.a, M.1.b, M.8, O.1	Biennially	Exercise; Drill

Objectives and Capability Targets	NUREG-0654/FEMA-REP-1, Rev. 2 Evaluation Criteria	Recommended Evaluation Frequencies	Recommended Assessment Activities
Capability Target 2.2: Emergency Worker Exposure Control Management			
Emergency workers manage radiological exposure and dose in accordance with the plans/procedures.	C.2.c, H.11, H.11.b, K.2.b, K.3, K.3.a, M.1.b, O.1	Biennially	Exercise; Drill
Objective 3: Alert and Notification			
Capability Target 3.1: Communications			
Communication processes, systems, and equipment are sufficient to support emergency operations.	E.1.a, E.3, F.1, F.1.a, F.1.b, F.1.c, F.3, O.1	At every assessment activity	Exercise; Communication Drill (N.4.e)
Capability Target 3.2: Alert and Notification of the Public			
Alert and notification of the public is completed in a timely manner.	E.2, E.4, E.5, F.3, O.1	Biennially	Biennial exercise only
Capability Target 3.3: Emergency Information and Instructions for the Public and News Media			
Accurate emergency information and instructions are provided to the public and the news media in a timely manner.	E.2, E.4, E.5, G.1, G.2, G.3, G.3.a, G.4, G.5, O.1	Biennially	Biennial exercise only
Objective 4: Detect, Measure, Sample, Analyze, and Assess			
Capability Target 4.1: Field Monitoring Teams Management			
FMTs are managed to obtain information to help characterize the release, locate and track the airborne radiological plume, and control contamination.	H.11, H.13, I.5, I.6, I.9, I.10, M.7, M.8, O.1	Biennially	Exercise; Drill
Capability Target 4.2: Plume Phase Measurements and Sampling			
FMTs make, record, and report measurements of ambient radiation to appropriate authorities; radioiodine and particulate samples are collected.	H.9, H.11, H.11.a, H.11.b, H.12, H.13, I.2, I.5, I.6, I.7, I.8, I.9, I.10, O.1	Biennially	Exercise; Environmental Monitoring Drill (N.4.d)
Capability Target 4.3: Post-Plume Phase Measurements and Sampling			
FMTs take measurements and samples to support assessment of the ingestion exposure pathway, and to support reentry, relocation, and return decisions.	H.11, H.11.a, H.11.b, H.12, H.13, I.2, I.5, I.6, I.8, M.7, O.1	At least once every 8-years	Exercise; Environmental Monitoring Drill (N.4.d)
Capability Target 4.4: Laboratory Operations			
The laboratory performs radiological analyses to support protective action decision-making.	C.4, H.11, H.11.b, H.13, I.2, I.6, M.7, O.1	At least once every 8-years	Laboratory Drill (N.4.c)

Objectives and Capability Targets	NUREG-0654/FEMA-REP-1, Rev. 2 Evaluation Criteria	Recommended Evaluation Frequencies	Recommended Assessment Activities
Capability Target 4.5: Plume Phase Analysis and Dose Assessment			
Dose assessment considers all available information including plant conditions, environmental conditions, field monitoring data, sample analysis results, and dose projection calculations.	A.3, H.13, I.6, I.8, I.10, K.3, O.1	Biennially	Exercise; Drill
Capability Target 4.6: Post-Plume Phase Sampling Plan Development and Analysis			
Post-plume phase assessment considers all available information, including environmental conditions, field monitoring data, sample analysis results, and dose projection calculations.	A.3, H.13, I.2, I.6, I.8, I.10, J.12, J.14.b, J.14.c, K.3, M.7, M.8, O.1	At least once every 8-years	Exercise; Environmental Monitoring Drill (N.4.d)
Objective 5: Operate			
Capability Target 5.1: Monitoring, Decontamination, Sheltering, and Registration of Evacuees			
Facilities, equipment, and procedures are in place and utilized to provide monitoring, decontamination, identification, temporary shelter, congregate care, and registration of evacuees.	J.11.d, J.13, K.4, O.1	Biennially ³⁸	Exercise; Drill
Capability Target 5.2: Monitoring and Decontamination of Emergency Workers, Equipment, and Vehicles			
Facilities, equipment, and procedures are in place and utilized to provide monitoring and decontamination of emergency workers and their equipment and vehicles.	K.4, O.1	Biennially ³⁹	Exercise; Drill
Capability Target 5.3: Transportation and Treatment of Contaminated, Injured Individuals			
Transport contaminated, injured individuals to medical facilities with the capability to monitor and decontaminate.	C.2.d, F.2, H.11, H.12, J.2, K.3, K.4, L.1, L.3, L.4, O.1	Biennially	Medical Services Drill (N.4.b)
Capability Target 5.4: Traffic and Access Control			
Appropriate traffic and access control is established. Accurate instructions are provided to traffic and access control personnel.	H.12, J.8, J.8.b, J.10, J.10.a, J.11.c, J.11.e, J.11.f, J.14.d, J.14.e, M.1.b, O.1	Biennially	Exercise; Drill

³⁸ For shelter or congregate care facilities managed by the American Red Cross under the American Red Cross/FEMA MOU, they will be evaluated once when designated and/or when substantial changes occur. All other facilities, including those not managed by the American Red Cross, must be evaluated no less than once every eight years with participation being rotated among facilities such that each facility designated in the plan is evaluated no less than once every eight years.

³⁹ Participation may be rotated among facilities, but each facility designated in the plan must be evaluated no less than once every eight years.

c. The Training and Exercise Planning Workshop (TEPW)

OROs and FEMA Regions should coordinate to ensure that REP Program assessment activities, encompassed in the work plan, are considered at the most relevant (i.e., local, regional, state) TEPW. The purpose is to review all trainings, exercises, and plans to incorporate the activities noted in the work plan in the upcoming year's schedule. If another scheduled activity or exercise provides an opportunity to address REP Program requirements, OROs can take full advantage of that activity and reduce or eliminate redundant assessment activities. The overall goal is to include REP assessment activities and trainings in the local TEPs, as appropriate.

3. Developing REP Exercise Documents

When planning REP Program assessment activities, OROs and FEMA Regions should work together to find common ground between identified REP Program requirements and OROs' emergency preparedness priorities. This will set the course to sustain, build, and validate capabilities that satisfy FEMA's requirements for reasonable assurance while still furthering OROs' preparedness capabilities within the greater NPS.

FEMA Regions and OROs have the following responsibilities in creating and executing the work plan for the biennial assessment period.

FEMA REGIONS

- Lead the effort to develop work plans with OROs.
 - Determine requirements for the biennial assessment period.
 - Determine what each jurisdiction/organization needs to demonstrate based on their roles/responsibilities.
 - Determine each assessment activity type (e.g., exercise, drill, seminar, training, SAV, actual incidents, etc.) in coordination with OROs.
 - Schedule REP Program assessment activities in coordination with OROs.
- Prepare a budget for each work plan, by assessment activity, for FEMA Headquarters.
- Assess OROs' capabilities and compile a report for each individual assessment activity.
- Compile overall results of the biennial assessment period in the Biennial Preparedness Report.

OROs

- Coordinate internally to identify jurisdictional requirements, needs, and gaps (e.g., utilizing jurisdictional strategic priorities, core capabilities, THIRA information, etc.).
- Work with FEMA Regions to develop individual work plans that address OROs' emergency preparedness priorities and achieve REP Program requirements.
- Schedule and participate in REP Program assessment activities.
- Invite FEMA Region to planned or actual incident responses that may assist in assessment of capabilities identified in the work plan.

a. Work Plan Considerations

The work plan is not a static document and should be updated as needed during the biennial assessment period to include emerging opportunities for assessment.

At a minimum, the work plan should directly address or at least consider the following:

(1) *Biennial Assessment Period Timeline*

The biennial assessment period timeline should identify the milestones for the agreed-upon activities that will be evaluated during the period. The timeline will remain flexible to accommodate changes or needs that may evolve during the period, such as actual incidents.

(2) *Objectives/Capability Targets*

The objectives/capability targets found in Section C of this Part of the RPM are REP Program-specific and address the 16 planning standards. These objectives/capability targets are core capability-neutral; meaning that any capability target can be aligned with any core capability, essentially allowing for the OROs to support their core capability priorities with REP Program assessments. Further, these objectives/capability targets represent REP Program minimums and therefore may be modified, in coordination with the FEMA Region, to be more rigorous.

(3) *Extent-of-Play Agreements*

The extent-of-play agreements will document and define the agreed-upon approach to demonstrating and evaluating the REP Program objectives/capability targets. These documents are intended to define the commitment of participants in advance and should outline those commitments, as well as the facilities to be evaluated or utilized and the anticipated level of participation. The extent-of-play agreement should also capture activities that may deviate in demonstration from plans and procedures as currently written, such as pre-staging personnel at or near a facility prior to activation during an exercise. These extent-of-play agreements will provide reliable information for developing the assessment activity and ensure appropriate evaluation.

b. Exercise Planning Considerations

Exercises and drills will be conducted using the HSEEP methodology and guidance. However, there are several considerations that should be taken into account, as well as some areas where REP Program exercises and drills may differ from the strict interpretation of the HSEEP methodology and guidance.

(1) *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 Regional staff. If the ORO has a shortage of available personnel, then ORO representatives may serve on the exercise planning team as confidential representatives or trusted agents and/or fill a role that would not employ access to confidential, exercise-specific information. For example, this person could serve as traffic/access controller, reception center monitor, dispatcher, or dose assessment team member, but could not serve as primary decision-maker.

(2) *Exercise Types*

The FEMA Region(s), state(s), and licensee work together to develop the scenario. Once complete, the scenario is officially submitted to the appropriate FEMA Region for review at least 60 days before the exercise. The FEMA Region 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 objectives/capability targets and extent-of-play agreement.

Plume Exposure Pathway Exercise. Plume exposure pathway exercise play requires a scenario that will drive the demonstration of capabilities to protect public health and safety within the plume exposure pathway EPZ. In general, the source term and resultant dose projections must each be of sufficient magnitude and distance from the plant to drive the performance of the agreed-upon objectives/capability targets and extent-of-play agreement. Although PARs and PADs may be based entirely upon plant conditions or other factors for plume exposure pathway exercise play, it is preferable to have a release that produces doses that exceed EPA PAGs at least 3 miles from the NPP in order to sufficiently drive plume exposure pathway exercise activities. Since the 5 rem child thyroid dose is a supplementary PAG, it is preferred that a 1 rem TED dose over 4 days be exceeded. However, the plume must contain enough radioactive iodine, at least 10^{-7} $\mu\text{Ci}/\text{cc}$, at a location and for a duration sufficient to allow offsite FMTs to collect and field count representative air samples. More specific information regarding the scenario requirements for the plume exposure pathway exercise can be found in the guidance within Part II, under evaluation criteria N.2.a, N.3, N.3.a-d, and the Exercise Scenario Review Checklist within Part IV.

Ingestion Exposure Pathway Exercise. For ingestion exposure pathway scenario development, the scenario must drive exercise play for all participating jurisdictions within the ingestion exposure pathway EPZ. The scenario will need to ensure that the radioactive plume and consequent ground deposition affect the appropriate areas within these jurisdictions. Specifically, it is necessary to exceed the FDA PAGs for some foodstuffs well past the plume exposure pathway EPZ, preferably out to at least 25 miles from the NPP. It is necessary for the source term to contain iodine and some long-lived radionuclides (e.g., cesium or strontium). Food samples analyzed during the intermediate phase should have a mix of samples that do exceed FDA DILs and some that do not exceed FDA DILs. More specific information regarding the scenario requirements for the ingestion exposure pathway exercise can be found in the guidance within Part II, under evaluation criteria N.2.b and the Exercise Scenario Review Checklist within Part IV, Section K. Ingestion exposure pathway exercise scenarios often incorporate the demonstration of relocation, reentry, and return activities.

Relocation, Reentry, and Return Activities. For relocation, reentry, and return activities, it is necessary to exceed the EPA relocation PAG of 2 rem annual dose (first year), preferably at least 7 miles from the NPP. It is also necessary for the source term to contain one or more long-lived radionuclides such as cesium. Soil sample radionuclide mix ratios must be consistent enough to allow offsite dose assessors to calculate an incident-specific DRL. For decision-making, an area that was evacuated during the early phase should fall outside the intermediate phase relocation area and at least one location that was not evacuated during the early phase should fall within the intermediate phase relocation area.

(3) Scenario Elements

Part II of this Manual discusses the NUREG-0654/FEMA-REP-1, Rev. 2 evaluation criteria N.3 and N.3.a-d, which define the scenario elements and their frequency of use during the 8-year exercise cycle. A table depicting this information can be found in Part IV, Section D.

(4) Scenario Variable

There are no requirements for the use or frequency of the scenario variables. However, whenever practicable, FEMA encourages the use of the following when developing the exercise scenario:

Varied Radiological Release Effects and Meteorological Conditions. Varied release effects and meteorological conditions can be used to reduce the possibility of pre-conditioned responses. 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.

Initiating/Concurrent Events. A broad 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 Program objectives/capability targets. Such incidents may include:

- Natural disasters historically applicable to the area (e.g., hurricane, tornado, earthquake, flooding);
- Site-specific all-hazard incidents (e.g., incident involving near-site facility, train derailment on or adjacent to site owner-controlled area); and
- Seasonal factors that impact the PARs and decision-making process (e.g., transient populations, weather conditions, and agricultural seasons).

c. Exercise Evaluation Guides (EEGs)

FEMA recommends that REP exercise planners utilize EEGs. These EEGs are designed to maintain the integrity of the REP objectives/capability targets and to ensure provision of useful information that support the creation and maintenance of OROs' core capabilities. The FEMA REP program EEG templates will be available for download from the PrepToolkit once the system is updated to accommodate the revised Part III of the 2019 RPM.

The FEMA Region decides the degree of exercise planning team and ORO involvement in tailoring the EEGs for each assessment activity. There is no requirement for OROs to be involved in the EEG development process, though such involvement is beneficial.

4. Conducting REP Assessment Activities

This section provides guidance for activities conducted immediately before and after exercises and other assessment activities.

a. Assigning and Confirming Evaluators

REP assessment activities may necessitate the use of evaluators specifically trained to identify and evaluate the REP Program objectives/capability targets. The FEMA Region bases its determination regarding the number of REP evaluators needed on the number of jurisdictions/organizations participating, the objectives/capability targets selected for each activity, and the extent-of-play agreement.

b. Post-Assessment Activity Meetings

44 CFR 350.9 requires a post-exercise participant briefing and public meeting. While this requirement is for biennial exercises only, FEMA recommends and encourages the use of meetings at the conclusion of any type of assessment activity to allow for discussion of demonstrated strengths and areas for improvement, this may take the form of a hot wash but is not required to.

(1) Participant Briefing

FEMA uses the participant briefing conducted after the biennial exercise as an opportunity to present OROs with initial exercise results. These results include demonstrated strengths and potential findings. The briefing provides OROs with the opportunity to discuss the preliminary results of the exercise so they have a clear understanding of the findings and can provide their perspective. At this stage, the RAC Chair may discuss potential issues not yet classified as Level 1 or Level 2 Findings.

The participant briefing should address the following: a review by the RAC Chair of offsite activities, an opportunity for OROs to provide their perspective, a review of Federal response, when applicable, and a question-and-answer period.

(2) Public Meeting

The public meeting is an opportunity to discuss the evaluation of the REP exercise with the public. The RAC Chair may combine the participant briefing with the public meeting at his or her discretion. Per 44 CFR 350.9, 10, the state or licensee publishes notice of the public meeting seven days prior to the biennial 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, the licensee, and other Federal agencies. Members of the public and media may attend as observers.

While the public meeting may not go into the same amount of detail and depth as the participant briefing, it should address all of the items seen in the participant briefing, and may also include a review of onsite actions (presented by the NRC) and a presentation of the licensee perspectives.

During the public meeting, the FEMA Regional Administrator (or designee) provides an overview of the biennial 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 Level 1 or Level 2 Findings.

The FEMA Regional Administrator (or designee) has the discretion to accept written comments from the public and media during or after the meeting. 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) has the discretion to 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.

5. Documenting REP Program Assessment Activities

a. Identifying Outcomes and Classifying Issues

During any assessment activity, evaluators will be present to observe and take extensive notes on the events that occur. Evaluators will note any variations from expected actions or processes, but the emphasis will be on performance and outcomes. After the assessment activity, evaluators will compile their observations into narratives, or another format appropriate for the activity, that describe the capabilities demonstrated and any findings or problems in the organization's ability to carry out expected actions.

Each assessment activity will have an associated evaluation report that describes the evaluators' observations, provides an evaluation of the successfulness of the activity by objectives/capability targets, and may include recommendations for improvements. For demonstrations, this will be an AAR/IP, however these reports are not limited to the AAR/IP format and the expectations for the reporting format should be discussed and documented in the work plan prior to an assessment activity taking place.

(1) Identifying Issues

An issue is a problem in organizational performance that is linked with specific planning standards or associated NUREG-0654/FEMA-REP-1, Rev. 2 evaluation criteria. The REP program uses specific terminology to characterize issues identified during an assessment activity. FEMA has established the following categories of issues:

- **Level 1 Finding.** An observed or identified inadequacy of organizational performance during an assessment activity that could cause 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 NPP.

- **Level 2 Finding.** An observed or identified inadequacy of organizational performance during an assessment activity 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/implementing procedures, rather than in that of the ORO's performance.

FEMA includes these issues in the evaluation report associated with the assessment activity.

(2) Correcting Issues during the Assessment Activity

In some circumstances, an ORO may correct an issue immediately during the assessment activity. FEMA and the OROs negotiate the immediate redemonstration of issues before the start of the assessment activity. While each Region's RAC Chair ultimately determines the objectives and capability targets eligible for redemonstration, this should be discussed upfront and documented in the work plan and/or extent-of-play agreements.

During the assessment activity, an evaluator who notes that an ORO did not correctly demonstrate activities for an objective/capability target eligible for redemonstration advises the appropriate controller, or another appropriate individual dependent on the type of assessment activity, 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 assessment activity. The controller or other ORO personnel will retrain the staff that performed the activity incorrectly. Upon completion of the retraining, those staff will redemonstrate the activity. If the ORO demonstrates that activity adequately, the evaluation report 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, will determine the severity of each issue. If the RAC Chair determines that an issue will be a Level 2 Finding, the evaluator will complete a specific issue narrative. However, if the RAC Chair classifies the issue as a potential Level 1 Finding, he or she will notify FEMA Headquarters of the issue. The RAC Chair must then, within two days, write a description of the issue and the reasons he or she believes it may receive a Level 1 Finding classification. FEMA Headquarters staff will, in turn, notify NRC Headquarters.

(4) Standardized Issue Numbering

FEMA employs a standardized system for numbering issues. This system provides consistency in numbering identified issues among FEMA Regions and site-specific reports within each Region. It also expedites tracking of issues on a nationwide basis. FEMA assigns each issue a unique identification number. While FEMA may need to add or delete issues during the post-activity review process, only the last two digits of the identification numbers will change when the evaluation report is finalized.

Elements of the Standard Issue Number.

The identifying number for Level 1 Findings, Level 2 Findings, 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 Appendix E for a list of these codes).
- **Year.** Last two digits of the year the exercise was conducted.
- **Objective/Capability Target.** The numbers corresponding to the objective/capability target in Part III.C of this Manual.
- **Classification.** L1 = Level 1 Finding, L2 = Level 2 Finding, and P = Plan Issue.
- **Identifying Number.** A separate two or three digit indexing number assigned to each issue identified. Level 1 Findings, Level 2 Findings, and Plan Issues are numbered separately, with issue numbers beginning with "01" in each category.

Exhibit III-2: Example of the Standard Issue Number

Example: Issue Number: 76-18-3.2-L2-01				
76 Plant Site Identifier	18 Year	3.2 Objective/ Capability Target	L2 Classification Level 1 Finding (L1) Level 2 Finding (L2) Plan Issue (P)	01 Identifying Number

(5) Additional Observations

The following terms are used to capture the knowledge and experience gained from both positive and negative actions during assessment activities:

- **Demonstrated Strength.** A demonstrated strength is an observed action, behavior, procedure, and/or practice that is worthy of special notice and recognition.
- **Best Practice.** A best practice is an exemplary, peer-validated technique, procedure, good idea, or solution that works and is solidly grounded in actual operations, training, and exercise experience.
- **Lessons Learned.** A lesson learned is knowledge and experience, positive or negative, derived from actual incidents, as well as those derived from observations and historical study of operations, training, and exercises.

Best Practices and Lessons Learned should be shared with the [REPP RPM Implementation Community](#) within the PrepToolkit.

b. Determining Objective/Capability Target Status

Once all issues are classified, the RAC Chair is responsible for describing the status of each objective/capability target evaluated by individual jurisdictions and/or functional entities during each assessment activity. The RAC Chair may use any of the five terms that describe the status of the scheduled objectives/capability targets for each jurisdiction and/or functional entity after the assessment activity. Information denoting the scheduled objectives/capability targets, and the OROs expected to demonstrate for each assessment activity, is reflected within each evaluation report.

- **Met (M)** – The jurisdiction or functional entity performed all activities under the objective/capability target to the level required per the work plan and/or the extent-of-play agreement, with no Level 1 or Level 2 Findings evaluated under that objective/capability target during the current activity and no unresolved prior Level 2 Finding(s).
- **Level 1 Finding (L1)** – An observed or identified inadequacy of organizational performance during an assessment activity that could cause 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 NPP.
- **Level 2 Finding (L2)** – An observed or identified inadequacy of organizational performance during an assessment activity that is not considered, by itself, to adversely impact public health and safety.
- **Plan issue (P)** – An observed or identified inadequacy in the ORO’s emergency plan/implementing procedures, rather than that of the ORO’s performance.
- **Not Demonstrated (N)** – For a justifiable reason, the jurisdiction or functional entity did not perform assessment activities under the objective/capability target as specified in the extent-of-play agreement.
- **Not Applicable (N/A)** – The objective/capability target does not apply to the jurisdiction.

FEMA may grant an ORO an exemption from scheduled evaluation of one or more objectives/capability targets if the ORO cannot participate due to response to an actual incident. If this situation is known in advance of the activity, 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 objectives/capability targets for an assessment activity, the evaluation report lists those criteria as **MET** and documents the exemption rationale in the work plan and/or the extent-of-play agreement.

If the ORO does not receive an advance exemption and does not perform the activities under scheduled objectives/capability targets during the activity, the RAC Chair carefully reviews and considers the facts surrounding the reasoning for not performing the activities scheduled. If the RAC Chair determines that the reason for not performing the activities was valid, the objectives/capability targets status is defined as **NOT DEMONSTRATED**. In general, a jurisdiction or functional entity may justify not demonstrating an objective/capability target because:

- Participation of the assessment activity had to be suspended so the ORO, or members of its staff, could respond to an actual emergency during the time the assessment activity was being conducted; or
- A significant extenuating circumstance, such as a fire or flood at the facility, prevented its use during the assessment activity.

Note that in all cases where an objective/capability target 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 objectives/capability targets was not justified, the objectives/capability target's status is defined as a **LEVEL 1 FINDING**.

c. Notifying the State of Level 1 Findings

Within two days of an assessment activity, the RAC Chair initiates consultation with FEMA Headquarters, RAC members, and the state in order to identify potential Level 1 Findings. 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 Level 1 Findings identified; (c) remedial actions recommended to correct the Level 1 Findings; and (d) a timeframe for completion of remedial actions. The Regional Administrator (or designee) forwards the letter within 10 days of the assessment activity to the state informing it of identified Level 1 Findings and the actions needed to correct the problem(s). Within 20 days of the assessment activity, the state acknowledges receipt of this letter and may either propose a schedule for remedial actions or appeal the issue classification of a Level 1 Finding.

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 the FEMA/NRC MOU.

The FEMA Regional Administrator (or designee) determines the extent of ORO participation in a remedial assessment activity (e.g., a drill). OROs demonstrate only those activities necessary for correction of the Level 1 Findings. To the extent possible, FEMA limits participation in remedial assessment activities to the OROs that have Level 1 Findings. 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 Level 1 Findings. The NRC Regional Administrator arranges licensee participation, if needed.

The primary reason for providing states with formal documentation of identified Level 1 Findings 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 assessment activity, all involved participants will be made aware of significant issues and problems that necessitate prompt correction. Subsequent formal notification of Level 1 Findings more than 10 days after the

assessment activity date does not, therefore, preclude prompt correction of Level 1 Findings 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 Evaluation Reports

The evaluation reports document the results of the various activities evaluated by the objectives/capability targets throughout the biennial assessment period, including plan reviews, exercises and drills, reviews of ALCs, equipment and inventory checks, and other activities. Evaluation reports may or may not include an IP depending on the activity and overall evaluation. Evaluation reports use the AAR/IP format to capture observations from assessment activities specific to demonstrations and will include recommendations for post-exercise and post-drill improvements. All evaluation reports are designed to meet varying levels of sensitivity so portions not intended for public disclosure can be separated and protected. These individual evaluation reports contribute to the larger assessment of the objectives/capability targets by core capabilities over the biennial assessment period and are incorporated into the Biennial Preparedness Report.

Generally, the FEMA Region sends draft evaluation reports to the state(s) and RAC members for review and comment within 30 calendar days from the date(s) the assessment activities are evaluated and comments are provided back to FEMA no later than 60 calendar days from the date of the assessment activity. Review and comment periods for draft evaluation reports may be reasonably reduced or expanded from these time periods at the RAC Chair's discretion and recorded in the work plan. The evaluation report is finalized no more than 90 days after the assessment activity is conducted. Once final, the FEMA Region provides the state(s) with the final report and a letter describing the activity evaluated and the associated objectives/capability targets that were achieved.

All review and comment focuses on the accuracy of data and information contained in the draft evaluation report, identification and proper classification of issues, and overall report quality. Those reviewing the draft evaluation report may contact the RAC Chair or report preparation staff for clarification of any items in question.

The RAC Chair receives all comments in writing, to facilitate the consideration and incorporation of comments, and the Schedule of Corrective Actions received, if applicable. The RAC Chair retains the 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 evaluation report.

e. Developing the Improvement Plan (IP)

The IP is an outcome of the evaluation report. The IP contains information on how OROs will correct or improve Level 1 Findings, Level 2 Findings, and Plan Issues, who is responsible, and an anticipated timeline for correction/improvement. As FEMA documents each Level 1 Finding, Level 2 Finding, or Plan Issue within the evaluation report, OROs make a corresponding entry in the IP. The content of the IP will be negotiated during the after-action meeting (AAM), so it is not necessary for all information to be filled in when the draft evaluation report and IP goes out for comment. FEMA Regions will follow up with OROs to ensure that IP corrective actions related to the Level 1 or Level 2 Findings or Plan Issues identified by FEMA are met.

f. Conducting the After-Action Meeting (AAM)

The FEMA RAC Chair (or designee) holds an AAM to present, discuss, and refine draft evaluation reports and to develop IPs. The Regions provide draft evaluation reports and IPs to the state within 30 days of the evaluated assessment activity. For demonstrations in particular, the FEMA RAC Chair (or designee) should hold the AAM as soon as practical after the evaluated assessment activity so that participants can easily recall the events. The AAM may take place in person or virtually.

g. Issue Correction

The guidelines for correcting Level 1 Findings, Level 2 Findings, and Plan Issues identified during assessment activities are listed below.

(1) Correction of Level 1 Findings

Because of the potential impact of Level 1 Findings on public health and safety, Appendix 1 to 44 CFR 350 requires corrections within 120 days of identification. An ORO demonstrates correction of Level 1 Findings identified through remedial actions, including exercises, drills, plan/procedure revisions, or other actions. For actions conducted to correct a Level 1 Finding, the RAC Chair will prepare a separate evaluation report of the remedial assessment activity within 30 days of the remedial action. OROs should successfully complete remedial actions within 75 days of the evaluated assessment activity. FEMA includes the results and findings of the remedial action in the final evaluation report and the Biennial Preparedness Report.

If a remedial exercise or other remedial actions occur, but the ORO does not correct the Level 1 Finding, FEMA initiates the following process immediately:

- Consult and coordinate with all pertinent parties, including the state(s), the NRC, and RAC member agencies, to discuss resolution of the Level 1 Finding and reach agreement on the specific corrective actions that need to occur and the timetable for completing those corrective actions.
- 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.
- Provide the agreed-upon schedule of corrective actions and timeline to the NRC, state(s), and licensee.

This entire process is completed within 10 calendar days of the remedial action in which the ORO did not resolve the Level 1 Finding.

If a Level 1 Finding remains unresolved at the end of the 120-day period following the biennial exercise, FEMA will issue an evaluation report that clearly: (a) describes the effort expended and specific actions taken to resolve the Level 1 Finding during the initial 120-day period; (b) delineates the specific corrective actions that need to occur to resolve the Level 1 Finding 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 Level 1 Finding.

If these efforts fail to achieve the satisfactory resolution of the Level 1 Finding, and all possible paths toward its resolution have been exhausted, the FEMA Region will issue an evaluation report, 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 Level 1 Finding; and (b) identify the factors or obstacles that have led to the conclusion that all possible paths for resolving the Level 1 Finding have been exhausted. Prior to issuance of any such report, the FEMA Regions must coordinate with the REP Branch Chief and Technological Hazards Division Director, NPD, at FEMA Headquarters. If FEMA has approved offsite planning and preparedness for the state under 44 CFR Part 350, FEMA will initiate steps to withdraw approval under 44 CFR § 350.13.

(2) Correction of Level 2 Findings

The ORO completes correction of Level 2 Findings as soon as practicable and FEMA verifies the correction at the next available opportunity for demonstration, as negotiated with the RAC Chair. 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 Level 2 Findings during an assessment activity at another site within the state or where the plume exposure pathway EPZ impacts the state.

(3) Correction of Plan Issues

If, during an exercise or other assessment activity, FEMA identifies some section of the plans/procedures as inadequate, it will report a Plan Issue to the OROs for correction.

FEMA includes Plan Issues in the evaluation report and/or 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 evaluated assessment activity. The ORO corrects Plan Issues through revision of the appropriate plans/procedures during the next annual plan review and update. The state submits corrections for FEMA review and reports them in the ALC.

h. Preparing the Biennial Preparedness Report

At the conclusion of the evaluation and reporting of all activities evaluated during the biennial assessment period, FEMA prepares the Biennial Preparedness Report. This report consists of a summary of FEMA's reasonable assurance determination in terms of the core capabilities assessed through evaluations of the objectives/capability targets throughout the biennial assessment period. The results of all the evaluation reports, as well as the work plan and other supporting documentation produced during the biennial assessment period are appended to the Biennial Preparedness Report.

The FEMA RAC Chair will provide the draft Biennial Preparedness Report for review by FEMA Headquarters and the FEMA Regional Administrator (or designee) no later than 30 days following the conclusion of all reporting for the biennial assessment period. The Biennial Preparedness Report is finalized within 60 days following the final reporting of all evaluations for the biennial assessment period.

The RAC Chair must prepare a letter validating reasonable assurance for the NRC to accompany the Biennial Preparedness Report, 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 Biennial Preparedness Report to the NRC Regional Administrator no more than 60 days after all assessment activities for the biennial assessment period have been evaluated and reported.

The RAC Chair distributes copies of the final Biennial Preparedness Report 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 the 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 and the report will be also be sent to the FEMA Headquarters REP Program Branch Chief and their Regional Liaison Officer (RLO) within 60 days after all assessment activities for the biennial assessment period have been evaluated and reported. This will be an indication for the RLO to retrieve the final Biennial Preparedness Report and save it to Headquarters' shared drive.

6. REP Program Assessment Activity Credit

FEMA will consider granting REP Program assessment activity credit to OROs for their participation in a response to real-world incidents and/or alternative REP demonstrations.

When considering granting assessment activity credit for a response to an actual incident or alternative REP demonstration, the FEMA RAC Chair should consider the ultimate outcomes of the ORO's performance. During actual incidents, OROs are focused more on responding to a variety of varying conditions than ensuring documentation and other materials are

preserved for FEMA scrutiny; the same can be said of alternative REP demonstrations. FEMA will take into consideration the outcomes of an ORO's response, or simulated response in the case of alternative REP demonstrations, that demonstrates the ability to meet corresponding capability targets and focus less on exercising scrutiny over the specifics of the paths used to ultimately achieve them.

To assist FEMA in reviewing assessment activity credit, FEMA will consider the OROs' demonstrated capabilities to achieve the following list of activities; this list should not be considered exhaustive and the provision of credit is ultimately at the discretion of the RAC Chair.

- 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.

For OROs seeking credit for participating in alternative REP demonstrations, FEMA will, to the extent practicable, attend and evaluate the OROs' demonstration of capabilities in the exercise that relate to FEMA's biennial assessment. Should FEMA not be able to attend/evaluate the alternative demonstration or if the ORO is requesting credit for response to a real-world incident, then the ORO will provide as much of the following documentation as possible to FEMA:

- Type and nature of the incident or topic/scenario for the alternative REP demonstrations;
- Timeline, including time of response and time the ORO staff arrived at the facility;
- Any applicable incident or demonstration documentation including sign in/sign out sheets with name(s), function(s), date(s), and time(s) or demonstration documentation such as an ExPlan or any briefing materials;
- List of applicable/participating personnel and organizations as well as their connection to a radiological emergency response;
- Communications log(s) showing the establishment of communication links with other organizations;
- List of participating jurisdictions;
- Incident decisions made and implemented or those simulated during the alternative REP demonstration;
- Resources (e.g., facilities, equipment, etc.) used;
- List of corrective actions and/or improvement planning items identified in the evaluation report; and
- Additional documentation that includes sufficient information to support the performance of specific objectives/capability targets. For example, an ORO seeking credit for field monitoring activities includes field logs, calibration records, air sampling results, etc.

The request specifies the basis for the credit and the objectives/capability targets for which credit is requested. The request should also contain appropriate documentation, such as those specified above. Once all the information is gathered, the ORO submits a request for credit to the appropriate state. The state then provides this information to the appropriate FEMA RAC Chair within 90 days of the conclusion of the incident or reporting on the alternative REP demonstrations.

The FEMA RAC Chair will grant exemption from the evaluation of specific objective/capability targets at their discretion. Even when FEMA grants credit, the ORO may still have to perform certain demonstration functions throughout the biennial assessment period (e.g., exercise, drill participation) in order to avoid compromising an integrated demonstration.

C. REP OBJECTIVES/CAPABILITY TARGETS

1. Overview of REP Evaluation Methodology

FEMA assesses offsite planning and preparedness for communities within the plume and/or ingestion exposure pathway EPZs of commercial NPPs through an established set of objectives and capability targets that reflect the intent of the planning standards of 44 CFR 350 and the evaluation criteria of NUREG-0654/FEMA-REP-1. Thus, FEMA considers these objectives/capability targets to be the benchmarks for FEMA's validation of reasonable assurance.

Each of these objectives/capability targets apply to all aspects of FEMA's assessment and are reported out in terms of core capabilities in the Biennial Preparedness Report. There are five overarching objectives, each of which have a unique set of capability targets that support the accomplishment of the objective. The capability targets are associated with one or more core capabilities, as agreed to by the OROs and RAC Chairs. This assessment strategy supports FEMA's regulatory responsibilities and successfully aligns REP evaluation methodology with the doctrine of the NPS.

OBJECTIVE 1: EMERGENCY OPERATIONS MANAGEMENT

- Capability Target 1.1: Mobilization
- Capability Target 1.2: Direction and Control
- Capability Target 1.3: Protective Action Recommendations
- Capability Target 1.4: Protective Action Decisions for the Plume Phase
- Capability Target 1.5: Protective Action Decision Implementation for the Plume Phase
- Capability Target 1.6: Protective Action Decisions for the Post-Plume Phase
- Capability Target 1.7: Protective Action Decision Implementation for the Post-Plume Phase

OBJECTIVE 2: EXPOSURE CONTROL

- Capability Target 2.1: Emergency Worker Exposure Control Decision-Making Process
- Capability Target 2.2: Emergency Worker Exposure Control Management

OBJECTIVE 3: ALERT AND NOTIFICATION

- Capability Target 3.1: Communications
- Capability Target 3.2: Alert and Notification of the Public
- Capability Target 3.3: Emergency Information and Instructions for Public and News Media

OBJECTIVE 4: DETECT, MEASURE, SAMPLE, ANALYZE, AND ASSESS

- Capability Target 4.1: Field Monitoring Teams Management
- Capability Target 4.2: Plume Phase Measurements and Sampling
- Capability Target 4.3: Post-Plume Phase Measurements and Sampling
- Capability Target 4.4: Laboratory Operations
- Capability Target 4.5: Plume Phase Analysis and Dose Assessment
- Capability Target 4.6: Post-Plume Phase Sampling Plan Development and Analysis

OBJECTIVE 5: OPERATE

- Capability Target 5.1: Monitoring, Decontamination, Sheltering, and Registration of Evacuees
- Capability Target 5.2: Monitoring and Decontamination of Emergency Workers, Equipment, and Vehicles
- Capability Target 5.3: Transportation and Treatment of Contaminated, Injured Individuals
- Capability Target 5.4: Traffic and Access Control

Unless otherwise specified in the extent-of-play agreement, all actions during assessment activities are based on the ORO's plans/procedures and completed as they would be in an actual emergency.

2. Planning Assessment Considerations

Assessment of Planning Components.

As stated above, FEMA's planning and preparedness assessment strategy uses a combination of modes to assess different aspects of the OROs' approach and implementation of radiological emergency preparedness. FEMA will assess the capability targets through the ALC Checklist and Plan Review Checklist, both of which are organized by capability targets and can be assigned to a core capability or capabilities through the work plan process. Organizing the formal review of plans in this manner allows for FEMA to provide a meaningful analysis of the OROs' progress and/or maintenance of selected core capabilities.

PLANNING STANDARDS N AND P

Given the broad applicability of the NUREG-0654/FEMA-REP-1, Rev. 2 evaluation criteria associated with planning standards N and P, these evaluation criteria are not included in the planning references under the objectives/capability targets. Planning standard P describes the responsibility for the overall planning effort, while planning standard N defines the general requirements for exercise and drill conduct and evaluation. Essentially, these evaluation criteria encompass fundamental REP planning and preparedness elements.

Considering the integrated nature of these evaluation criteria among and throughout FEMA's assessment, their evaluation is not encompassed within a single set of objectives/capability targets. Thus the assessment of these evaluation criteria are principally achieved through the plan review and ALC processes, and are reported in the Biennial Preparedness Report under the Planning core capability.

3. Capability Target Components

Each capability target includes the following sections:

- **Intent.** A simple, concise statement that defines the approach and functional purpose of the capability target; essentially the goal of the evaluation under each capability target.
- **Planning References.** The NUREG-0654/FEMA-REP-1, Rev. 2 planning references included provide trace-back to the appropriate planning standards and demonstrate where and how the capability targets support regulatory compliance with the planning standards.
- **Core Capabilities.** The listing of core capabilities is meant to be a starting point for discussion, as the selection of core capabilities should be a result of coordination and discussion between FEMA Regional staff and OROs. This should not be considered an exhaustive list of core capabilities that could be associated with each capability target.
- **Demonstration and Evaluation Guidance.** The guidance in this section is intended for use by evaluators when preparing for a demonstration. Information includes critical tasks and key points of review requiring observation and assessment by evaluators. Each critical task and key point of review should be considered prior to the demonstration by reviewing the plans/procedures and extent-of-play. Performance of each critical task should be evaluated during the assessment activity, unless otherwise noted in the extent-of-play agreement.

Objective 1: Emergency Operations Management

Capability Target 1.1: Mobilization

Individuals with roles in support of emergency operations are identified, alerted, and mobilized in a timely manner.

Intent: The capability to alert, notify, and mobilize OROs to staff facilities in support of emergency operations.

Planning reference: NUREG-0654/FEMA-REP-1, Rev. 2 (A.1, A.1.a, A.1.b, A.3, A.4, A.5, C.1, C.2, C.2.a, C.2.b, C.3, E.1, E.1.a, E.3, F.1.c, H.6, and O.1)

Core Capabilities: Operational Coordination; Planning

ASSESSMENT – DEMONSTRATION AND EVALUATION GUIDANCE

By observing the OROs' capability to address the appropriate bullet points below and while considering the overall capability being assessed, the following key points of review and associated questions should be considered and will support an evaluation of this capability target.

ORO demonstrate the capability to:

- Alert, notify, and mobilize key personnel, to include a 24-hour staffing roster, and activate facilities in a timely manner.
 - What time was staff notified? What time did they arrive at the facility?
 - Did the ORO demonstrate the activation of facilities for immediate use by mobilized personnel upon their arrival?
 - Was activation of facilities/locations completed in accordance with plans/procedures?
 - Were key emergency personnel contacted, alerted, and mobilized in a timely manner?
 - Did the ORO demonstrate the ability to staff and maintain 24-hour operations?
 - Were position staff trained and in place for facility activation?
- Receive and verify notifications.
 - Who notified the ORO? Licensee or other?
 - For reverse notification, how was the licensee notified?
 - Was the notification/information verified? How?
 - What was the initial ECL? Were changes to ECLs communicated in the same manner?
- Identify and request additional resources, as needed.
 - Was the ability to identify and request additional resources demonstrated? If not, was the ability to identify compensatory measures demonstrated?
 - Were MOUs and LOAs available for review?
- Determine a facility is operational.
 - What time was the facility declared operational?
 - What criteria was used to determine if the facility was operational?
 - What was the time difference between notifications of personnel and when the facility was declared operational?

Capability Target 1.2: Direction and Control

Individuals in leadership roles provide direction and control to the portion of the overall response effort for which they are responsible.

Intent: The capability to provide overall direction and control of response efforts, commensurate with the responsibilities of leadership, as detailed in plans/procedures.

Planning reference: NUREG-0654/FEMA-REP-1, Rev. 2 (A.1, A.1.a, A.1.b, A.1.c, A.2, A.3, A.5, C.2, C.2.a, C.2.b, C.3, D.4, E.1, H.6, and O.1)

Core Capabilities: Operational Coordination; Environmental Response/Health and Safety; Public Information and Warning; Mass Care Services; Public Health, Healthcare, and Emergency Medical Services; Situational Assessment; Critical Transportation; Planning

ASSESSMENT – DEMONSTRATION AND EVALUATION GUIDANCE

By observing the OROs' capability to address the appropriate bullet points below and while considering the overall capability being assessed, the following key points of review and associated questions should be considered and will support an evaluation of this capability target.

ORO demonstrate the capability to:

- Support protective action decision-making.
 - Who, by title and position, was in charge?
 - Who was authorized to make any PADs prior to an official PAR from the licensee?
 - Did decision-makers obtain input from their support staff?
- Conduct briefings in a timely manner.
 - Were briefings conducted in a timely manner?
 - What information was provided?
 - How frequently were briefings held?
 - Who gave the briefing?
- Maintain situational awareness.
 - Did the ORO maintain situational awareness? How?
- Coordinate response activities with other organizations.
 - Were response activities coordinated with other organizations? How?
- Obtain resources to support emergency operations.
 - Were resources obtained to support emergency operations (e.g., through MOUs or other agreements)?
 - Was just-in-time training provided, as necessary?
- Provide and maintain adequate facilities and equipment to support the emergency response.
 - Were facilities and equipment adequate to support operations? How so?
 - Was the facility evacuated during the plume? What means of monitoring and decontamination were used?

Capability Target 1.3: Protective Action Recommendations

Appropriate PARs are selected based on available information and other factors.

Intent: The capability to use dose assessment and field data, compare this data to the PAGs, and choose among a range of protective actions those most appropriate in a given emergency.

Planning reference: NUREG-0654/FEMA-REP-1, Rev. 2 (D.4, J.7, J.8, J.8.b, J.9, and O.1)

Core Capabilities: Operational Coordination; Environmental Response/Health and Safety; Situational Assessment; Planning

ASSESSMENT – DEMONSTRATION AND EVALUATION GUIDANCE

By observing the OROs' capability to address the appropriate bullet points below and while considering the overall capability being assessed, the following key points of review and associated questions should be considered and will support an evaluation of this capability target.

ORO demonstrate the capability to:

PLUME

- Select and implement pre-planned precautionary protective actions.
 - Who, by title/position and organization, made decisions to implement any preplanned precautionary protective actions outlined within plans/procedures?
 - What precautionary protective actions were taken? Why?
- Utilize the methodology in plans/procedures to select among a range of protective actions most appropriate in a given emergency. This could also include the use of preplanned precautionary protective actions contained in plans/procedures.
 - Were differences in dose projection greater than a factor of ten discussed with the licensee? If so, were the differences resolved, and timely and appropriately incorporated into the PAR?
- Develop PARs.
 - Who, by title/position and organization, developed each PAR?
 - What information (e.g., from the licensee, field monitoring data, release data, meteorological data, etc.) was used to develop each PAR?
 - Were PARs based on the ECL?
 - Were ETEs considered?
 - Were EPA and FDA PAGs considered when making PARs? Was any other criteria, guidance, and/or methodologies used?
 - Were recommendations for KI made and on what were they based?
 - What populations or groups were included in the KI PAR (e.g. general public, institutionalized)?
- Transmit PARs in a timely manner.
 - Who, by title/position and organization, transmitted each PAR to the decision-makers?
 - Who was the PAR provided to?

POST-PLUME

- Assess radiological consequences and provide appropriate PARs for the ingestion exposure pathway.
 - Who had the authority to make PARs for the ingestion pathway?
 - Were precautionary actions (e.g., placing animals on stored feed and water) were considered to protect the ingestion pathway?
 - Did the ORO coordinate on PARs developed for ingestion pathway?
 - What boundaries were recommended for the restricted area? Did this include a recommendation for a buffer zone?
 - Were projected doses considered in developing recommendations for relocation? Were they compared to the EPA PAGs?
 - Were FDA PAGs (DILs as a surrogate) considered when recommending holds or embargos?
 - Were recommendations made for exposure and dose limitations for those temporarily reentering the restricted area?
 - Were recommendations developed to assist decision-makers on relaxing protective actions to allow for return?

Capability Target 1.4: Protective Action Decisions for the Plume Phase

Appropriate PADs are based on available information for the plume phase.

Intent: The capability to utilize appropriate factors and necessary coordination in the decision-making process used to make PADs for the public.

Planning reference: NUREG-0654/FEMA-REP-1, Rev. 2 (D.1.b, D.4, J.6, J.7, J.8, J.8.b, J.10, J.10.a, J.10.b, J.11.c-g, and O.1)

Core Capabilities: Operational Coordination; Environmental Response/Health and Safety; Situational Assessment; Critical Transportation; Planning

ASSESSMENT – DEMONSTRATION AND EVALUATION GUIDANCE

By observing the OROs' capability to address the appropriate bullet points below and while considering the overall capability being assessed, the following key points of review and associated questions should be considered and will support an evaluation of this capability target.

ORO demonstrate the capability to:

- Coordinate and make PADs for members of the general public.
 - Who, by title and organization, made PADs?
 - Did PADs need to be coordinated with other jurisdictions?
 - Did all appropriate OROs communicate and coordinate precautionary protective actions and/or PADs amongst each other? Who was involved?
 - What applicable Federal guidelines were utilized when making PADs?
 - Were precautionary protective actions and/or initial PADs made in a timely manner based on the scenario?
 - What were PADs based on (e.g., ETEs, predetermined actions, information/PARs from the licensee, protective action strategy, ORO assessment of plant status, weather conditions, and/or radiological releases, other incident information, input from appropriate ORO authorities, overall risk assessment of evacuation vs. shelter-in-place, considerations for those with access and functional needs, etc.)?
 - Are any supplemental resources necessary to implement a PAD (e.g., law enforcement, fire service, HAZMAT, and medical resources)? If so, who can request Federal support?
 - Were PADs coordinated with the ICP, if applicable?
 - Were all decisions communicated with all affected locations in a timely manner?

- Coordinate and make PADs for those with access and functional needs.
 - What factors were considered for PADs made for those with access and functional needs?
 - Were there specific PADs for those with access and functional needs?
 - What was the basis of the PADs for those with access and functional needs?
- Coordinate and make PADs for students at schools.
 - How did the ORO alert and notify all school systems/districts of emergency conditions?
 - What were protective actions for schools based on?
 - What PADs were made?
 - How were the PADs coordinated?
- Coordinate and make subsequent or alternate PADs.
 - Were subsequent or alternate PADs made? What were they? On what were they based (e.g., changing metrological conditions, field data, updated dose projections, changes in plant conditions)?
 - Was the process for making PADs during a rapidly escalating situation different?
 - What were subsequent/alternate PADs based on?
- Coordinate and make decisions on the administration of KI (where applicable) for the public and institutionalized members of the population.
 - What was the KI decision-making process?
 - Did the decision require coordination with assessment and decision-making staff? Was it based on projected thyroid dose compared with the established PAGs?
 - Was there coordination among OROs involved in the decision-making process for KI administration?
 - Was the message content clear on KI instructions?
 - How was KI information provided to those who needed to take it?

Capability Target 1.5: Protective Action Decision Implementation for the Plume Phase

Implement decisions for those populations and areas subject to plume phase protective actions.

Intent: The capability to implement precautionary protective action and/or PADs, including evacuation and/or sheltering, for all populations within the plume and ingestion exposure pathway EPZs. The populations include those with access and functional needs, students, and institutionalized individuals.

Planning reference: NUREG-0654/FEMA-REP-1, Rev. 2 (A.4, C.2.a, G.1, J.11, J.11.a, J.11.b, J.11.c, J.11.e, J.11.g, and O.1)

Core Capabilities: Operational Coordination; Public Information and Warning; Environmental Response/Health and Safety; Critical Transportation; Health and Social Services; Housing; Natural and Cultural Resources; Planning

ASSESSMENT – DEMONSTRATION AND EVALUATION GUIDANCE

By observing the OROs' capability to address the appropriate bullet points below and while considering the overall capability being assessed, the following key points of review and associated questions should be considered and will support an evaluation of this capability target.

OROs demonstrate the capability to:

- Implement PADs, ensuring communication and coordination with all appropriate jurisdictions.
 - Were resources identified and utilized effectively?
 - Did OROs communicate and work together in an effective manner?
 - What type of coordination occurred on the implementation of protective actions?
 - Was the public kept informed and was the information provided relevant?
 - Were PADs implemented as directed?
 - What types of populations are in the plume exposure pathway EPZ (e.g., institutionalized, access and functional needs, non-English speaking, etc.)? Who is responsible for notifying each, and at what point during the incident?
 - Were there any gaps in resources identified? If so, how were they addressed?
- Assist those with access and functional needs during the implementation of PADs.
 - What time was the order received for those with access and functional needs?
 - Were the facility/facilities receiving those with access and functional needs listed in the plans?
 - How were individuals with services animals addressed?
- Communicate, coordinate, and implement protective actions for schools.
 - What school districts are located within the plume exposure pathway EPZ?
 - Who notifies school districts? How?
 - What was the protective action that the school took?
 - With regard to processing students, faculty, and staff, what sort of PADs were made?
 - At which ECL were the school districts notified?
 - If students were moved, which reclamation centers were they sent to? Which is the host school?
 - How were parents and/or guardians notified?
 - Are there schools located outside the plume exposure pathway EPZ that have students living within the EPZ? What arrangements are made for those students?
 - What type of transportation was provided to the students (e.g., bus, etc.)?
 - Who notifies the bus drivers?
 - Were there adequate buses available? And how do they communicate with the school?
 - Do the bus drivers know where to take the students? Are they trained on what to do?
 - Was the school evacuated during the plume? What means of monitoring and decontamination were used?
- Communicate with transportation officials.
 - What transportation needs or resources were required?
 - Was a list of the transportation providers available?
 - Were transportation providers contacted?
 - How were needs for transportation-dependent individuals met?
 - Were designated pick-up points used?

- Identify evacuation routes for the general public.
 - What evacuation routes were selected?
 - Were the direction of the wind/plume and/or other hazardous conditions considered in determining which evacuation routes were used?
 - How was this information communicated to the media and the public?
 - How were alterations to the pre-designated routes communicated to the media and the public?
 - Was the facility evacuated during the plume?
- Make KI available to both institutionalized persons and the general public, in accordance with plans and procedures.
 - How was the decision to take KI disseminated to the public and institutionalized persons?
 - Did the ORO provide KI to the general public and institutionalized persons? If so, how was it distributed?
 - What quantities of KI are available?
 - Where is KI stored?
 - What dosages of KI are available?
 - What is the expiration date of KI? If there is an extended policy, where is the letter certifying the extension?
 - Did the ORO ensure that the KI is stored in a temperature-controlled facility?
 - What information was provided to the general public with regard to KI?
 - What instructions were provided for the use of KI?
 - Did the instructions include dosages and frequency to take KI?
 - Did the instructions include contradictions and side effects of using KI? How was it explained?
 - How was KI ingestion documented for institutionalized persons?
 - Did staff maintain lists of the institutionalized individual who ingested KI?

Capability Target 1.6: Protective Action Decisions for the Post-Plume Phase

Appropriate PADs are based on available information for the post-plume phase.

Intent: The capability to assess the radiological consequences for the ingestion exposure pathway and post-plume phase, relate them to the appropriate PAGs, and make and coordinate timely, appropriate PADs to mitigate exposure.

Planning references: NUREG-0654/FEMA-REP-1, Rev. 2 (J.12, J.14, J.14.a-f, M.1, M.1.b, M.4, M.5, M.6, M.7, M.8, and O.1)

Core Capabilities: Operational Coordination; Environmental Response/Health and Safety; Situational Assessment; Critical Transportation; Housing; Planning

ASSESSMENT – DEMONSTRATION AND EVALUATION GUIDANCE

By observing the OROs' capability to address the appropriate bullet points below and while considering the overall capability being assessed, the following key points of review and associated questions should be considered and will support an evaluation of this capability target.

ORO demonstrate the capability to:

- Make post-plume phase decisions in a timely manner.
 - Who has the authority to make ingestion exposure pathway decisions?
 - Who has the authority to make decisions for relocation, reentry, reoccupancy, or return?

- What Federal guidance was utilized in the decision-making process?
 - What additional resources, if any, were requested or anticipated?
 - Were there any precautionary protective actions for the ingestion exposure pathway considered prior to analytical data?
 - Did ingestion exposure pathway assessment include analysis of water, food, and release characterization?
 - What times were decisions regarding the ingestion exposure pathway made, including precautionary protective actions?
 - How were boundaries of temporary embargo zones identified?
 - How were the boundaries of the deposition footprint determined (e.g., field and/or aerial measurements, deposition projections or a combination of sources)?
 - Were crops grown in affected areas identified? Was there a determination on how crops would be harvested or tracked?
 - How were water supply sources identified?
 - Were sample results obtained from specified labs? Were dose assessments based upon sample results? Were locations plotted on a map to identify areas that exceed PAGs?
 - What watershed and agricultural data was used to make decisions?
 - Did ANI participate and did they address compensation of loss?
- Make relocation decisions for the post-plume phase in a timely manner.
 - How were integrated doses in contaminated areas estimated? Were they compared to the PAGs?
 - How were the areas to be restricted identified/determined? What factors were used to make the decision (e.g., the mix of radionuclides in deposited materials, calculated exposure rates vs. the PAGs, field samples of vegetation and soil analyses, etc.)?
 - Was the optional approach (230 $\mu\text{R}/\text{hr}$) to determine the restricted area boundary utilized?
 - How was access to evacuated and restricted areas controlled? What agencies have that responsibility?
 - How was the area of interest identified?
 - If aerial measurements were used, what method or procedure will be used to identify the area of interest that is below the detection limit of the aircraft?
 - How did the ORO relocate members of the evacuated public who lived in areas that now have residual radiation levels in excess of the PAGs?
 - How did the ORO determine the area(s) to be restricted?
 - What resources are available for providing medical and social assistance for relocated individuals?
 - Make reentry decisions for the post-plume phase in a timely manner.
 - What was the coordinated strategy for authorized reentry of individuals to the restricted zone? What was considered when forming the strategy (e.g., established exposure limits, maintenance of essential services and/or property, security, retrieval of possessions, etc.)?
 - How did the ORO determine location of control points, who should be allowed to re-enter the restricted zone, and what provisions were made to determine and control their exposure?
 - How did the ORO provide for exit from the restricted area, including monitoring of persons, vehicles, and equipment?
 - What were the exposure limits, including the time period over which the dose would accumulate?

- Make return decisions for the post-plume phase in a timely manner.
 - What were the return boundaries based on? (e.g., political boundaries, physical boundaries)
 - Was return permitted to the boundary of the restricted area or was a buffer zone established?
 - Did decision-makers consider restoration of services for areas where return was allowed? (e.g., medical facilities, schools, utilities, roads, and intermediate housing).
- Make reoccupancy decisions for the post-plume phase in a timely manner.
 - What considerations are made for reoccupancy?
 - What factors were taken into account to consider reoccupancy?
 - What community organizations were part of the decision-making process?
 - What instructions were provided to the population allowed to reoccupy areas?
 - Were any additional actions necessary for populations to reoccupy an area? (e.g., washing down buildings, restricting use of backyard produce gardens)
- Coordinate PADs as appropriate.
 - What arrangements were made to coordinate potential decisions?
 - How were decisions coordinated internally and with other jurisdictions?
 - How were decisions communicated?

Capability Target 1.7: Protective Action Decision Implementation for the Post-Plume Phase

Implement decisions for those populations and areas subject to post-plume phase protective actions.

Intent: The capability to implement and coordinate PADs to mitigate exposure and address long-term radiological consequences.

Planning reference: NUREG-0654/FEMA-REP-1, Rev. 2 (C.2, J.12, J.14, J.14.a-f, M.1, M.1.b, M.4, M.5, M.6, M.7, M.8, and O.1)

Core Capabilities: Operational Coordination; Public Information and Warning; Environmental Response/Health and Safety; Critical Transportation; Health and Social Services; Housing; Natural and Cultural Resources; Planning

ASSESSMENT – DEMONSTRATION AND EVALUATION GUIDANCE

By observing the OROs' capability to address the appropriate bullet points below and while considering the overall capability being assessed, the following key points of review and associated questions should be considered and will support an evaluation of this capability target.

ORO demonstrate the capability to:

- Communicate and implement protective actions for agribusinesses, such as dairy farms, meat and poultry producers, fisheries, fruit growers, vegetable growers, grain producers, food processing plants, and water supply intake points.
 - How were agribusinesses notified of the PADs?
 - What coordination and communications among organizations responsible for implementing protective actions occurred? How were changes and developments communicated?
 - Were precautionary protective actions taken to prevent contamination?
 - Were Federal and other resources identified that will assist with determination and implementation of ingestion exposure pathway protective actions?

- Formulate protective action information (e.g., brochures, email, text message, etc.) for the general public and food producers and processors.
 - Were there instructions in the protective actions provided on what foods or crops were being affected?
 - Were protective actions clearly provided and were maps provided identifying the specific areas in which to implement the protective actions by the decision-makers?
 - Were reproduction-ready information and instructions to pre-determined individuals and businesses available for production and distribution (obtain copies of available information)? Was the information on the handouts current?
- Control, restrict, or prevent distribution of contaminated food by commercial sectors, ensuring communication and coordination with agencies responsible for enforcing food controls.
 - What were the state/local requirements to implement embargos or condemnations?
 - Who delivered condemnation or embargo notices to agribusinesses?
 - How were necessary legal notices delivered?
 - Did the ORO use Federal resources as identified in the National Response Framework Nuclear/Radiological Incident Annex, if needed?
 - What coordination and communications among organizations responsible for implementing protective actions occurred?
 - What measures were taken and what strategies were developed by the ORO to implement protective actions for general public and for food producers in the ingestion exposure pathway EPZ, including preventing distribution of potentially contaminated food?
 - Was there current information on the locations of permanent agribusiness facilities available? From what source was this information obtained?
 - In addition to the location of agribusiness sites, what other information (e.g., name and address of owner) was available?
 - Was there current information on harvest times available? From what source was this information obtained?
 - Was a plan developed to monitor transportation routes out of the affected areas and to monitor and sample foods on vehicles leaving the area?
 - Who is responsible to monitor and sample foods on vehicles and where will they be located?
 - Where or how were condemned food products taken for disposal?
- Communicate instructions to the public regarding relocation decisions and intermediate-term housing for relocated persons.
 - What coordination and communications among organizations responsible for implementing protective actions occurred?
 - How were decisions and instructions for relocation communicated to organizations and the public?
 - Was a monitoring and decontamination location included in the information provided to the public?
- Coordinate and implement decisions concerning relocation, including short- and/or long-term relocation of evacuees.
 - What coordination and communications among organizations responsible for implementing protective actions occurred?
 - How did the ORO coordinate and implement decisions concerning relocation of individuals from now-restricted areas?
 - What were the provisions of short-, intermediate-, and long-term relocation of evacuees from now-restricted areas?
 - Was the ORO prepared to provide housing?

- What were the arrangements made to relocate those displaced as a result of contamination? What provisions were made for their care and support?
- How were transportation-dependent evacuees transported from the restricted zone if they had not been previously evacuated? What transportation was provided? How was it communicated?
- Control reentry and exit of individuals who are authorized by the ORO to temporarily reenter the restricted area.
 - What coordination and communications among organizations responsible for implementing protective actions occurred?
 - What coordination and implementation of decisions for temporary reentry of individuals to restricted areas occurred?
 - What instructions/information were provided prior to reentry (e.g., map and plots of radiation exposure rates, advice on areas to avoid, associated time frames, etc.)?
 - How were those individuals permitted temporary reentry to restricted areas protected from unnecessary radiation exposure?
 - Were DRDs and PRDs assigned for emergency workers and individuals permitted temporary reentry to a restricted area? What information was provided regarding dosimetry use?
 - Were persons reentering escorted by someone trained in the use of dosimetry?
 - What were the procedures for exit from the restricted area(s) emergency workers and individuals?
 - What were the procedures for exit from the restricted area(s) for vehicles and other equipment?
 - How were dosimetry and exposure record handled upon exit from the restricted area(s)?
 - Was monitoring and decontamination conducted at the exit from the restricted area or at a separate center?
 - How were individuals transported into and out of the restricted area?
- Implement policies concerning return of members of the public to areas that were evacuated during the plume phase.
 - What coordination and communications among organizations responsible for implementing protective actions occurred?
 - How were services and facilities (e.g., utilities, food store/restaurants, hospitals, schools, etc.) that require restoration within a few days identified and prioritized?
 - What resources were available to facilitate restoration?
 - Was implementation of the decision to return supported by restoration of services and facilities?
 - Were hot spots decontaminated if necessary?

Objective 2: Exposure Control

Capability Target 2.1: Emergency Worker Exposure Control Decision-Making Process

A decision-making process involving consideration of appropriate factors and necessary coordination is used to ensure that an exposure control system is in place for emergency workers, and includes the use of radioprotective drugs and procedures to authorize emergency exposures in excess of the PAGs.

Intent: The capability to assess and control the radiation exposure and dose received by emergency workers and utilize a decision-making chain to authorize emergency worker exposure limits to be exceeded for specific missions.

Planning reference: NUREG-0654/FEMA-REP-1, Rev. 2 (C.2.c, H.11, K.2, K.2.b, K.3, K.3.a, M.1.b, M.8, and O.1)

Core Capabilities: Operational Coordination; Environmental Response/Health and Safety; Situational Assessment; Planning

ASSESSMENT – DEMONSTRATION AND EVALUATION GUIDANCE

By observing the OROs' capability to address the appropriate bullet points below and while considering the overall capability being assessed, the following key points of review and associated questions should be considered and will support an evaluation of this capability target.

ORO demonstrate the capability to:

- Control emergency workers' exposure and dose, including offsite workers performing duties onsite.
 - Who was responsible for managing emergency workers' exposure and dose?
 - Were projected doses and likely exposure rate patterns considered before dispatching workers?
 - Were any of the following considered: alternate entry and exit routes; potential changes to meet conditions; area or roads to avoid; what to do in the event of equipment or vehicle failure; and previous doses?
 - Were safety issues, supplemental to radiation, considered for the locations of field teams, the ICP, and other appropriate personnel?
 - How did incoming mutual aid, including Federal or private resources, obtain dosimetry, radioprotective drugs, and subsequent just-in-time training?
 - Who briefed emergency workers? Did the briefing include the following:
 - Ensuring dosimetry are zeroed or initial reading is recorded.
 - Frequency to read and record dosimeters.
 - The process of reporting exposures.
 - Proper placement of dosimeters.
 - Proper use of PRDs.
 - Ingestion and documentation of radioprotective drugs.
 - Potential adverse effects of radioprotective drugs.
 - The location to report to for monitoring and decontamination.
- Maintain record of dose as a result of exposure.
 - How were exposures and subsequent doses reported from the field documented?

- Authorize exposures and dose in excess of identified limits.
 - Who authorized emergency workers to receive exposure in excess of identified limits?
 - What were the identified limits?
 - How was this authorization documented?
- Process for considering occupational exposures and to authorize individuals to receive doses in excess of occupational dose limits.
 - Was occupational exposure considered for those working during the emergency, in both the intermediate and late phases of a NPP accident?
 - Who authorized occupational doses in excess of Federal limits?
- Determine a correction factor for DRD-based isotopic release mixture.
 - What approach was used to correct DRD readings to TED (e.g., dosimeter corrections factors)?
- Control exposure and dose for temporary reentry of emergency workers, or members of the public, to restricted areas.
 - What provisions were available for controlling exposure and dose rates for temporary reentry to restricted areas?
 - How were controlled exposure and doses documented for those reentering restricted areas?
- Determine the need to authorize radioprotective drugs using projected thyroid doses and field measurements. Projections are compared to previously established PAGs.
 - Who authorized emergency workers to take radioprotective drugs?
 - When was the decision made to authorize emergency workers to take radioprotective drugs?
 - Was the decision to use radioprotective drugs based on projected thyroid doses?
 - Were projected thyroid doses compared to establish PAGs?
 - Did the decision-making process for use of radioprotective drugs include close coordination with assessment and decision-making staff?
 - How was the decision to authorize radioprotective drugs communicated to emergency workers?
- Adequately protect members of the public from radiological exposure and control dose for those who are authorized to temporarily reenter a restricted area.
 - What provisions were there for dosimetry and contamination control for emergency workers and members of the public temporarily reentering a restricted area?
 - What exposure rates or limits were established for emergency workers and members of the public temporarily reentering a restricted area?
 - How were exposure and doses documented and controlled for emergency workers and members of the public temporarily reentering restricted areas?
 - What was the process for decontamination, collection of dosimetry, and recording exposures for emergency workers or members of the public exiting the restricted area following temporary reentry?
 - How was contamination monitoring and decontamination conducted for those exiting a restricted area?

Capability Target 2.2: Emergency Worker Exposure Control Management

Emergency workers manage radiological exposure and dose in accordance with the plans/procedures.

Intent: The capability of emergency workers to manage dose and exposure, use equipment (e.g., dosimetry, radio protective drugs), and identify procedures to monitor their exposure and dose, including following procedures to obtain authorization to receive emergency exposures in excess of the PAGs.

Planning reference: NUREG-0654/FEMA-REP-1, Rev. 2 (C.2.c, H.11, H.11.b, K.2.b, K.3, K.3.a, M.1.b, and O.1)

Core Capabilities: Operational Coordination; Environmental Response/Health and Safety; Planning

ASSESSMENT – DEMONSTRATION AND EVALUATION GUIDANCE

By observing the OROs' capability to address the appropriate bullet points below and while considering the overall capability being assessed, the following key points of review and associated questions should be considered and will support an evaluation of this capability target.

ORO demonstrate the capability to:

- Maintain an appropriate inventory of DRDs that are leak-tested or current in calibration.
 - What types of DRDs were used?
 - Were they consistent with the plans?
 - Were they current in calibration or leak test?
- Maintain an appropriate inventory of PRDs.
 - What type of PRDs were used?
 - Was the inventory of available PRDs sufficient for the number of workers?
 - How many PRDs were available?
- Retain an adequate supply of radioprotective drugs.
 - Was there an adequate supply of radioprotective drugs?
 - How many doses of radioprotective drugs were available?
 - Was the quantity of radioprotective drugs available sufficient for the number of individuals needing to take it?
- Adequately distribute appropriate DRDs and PRDs.
 - Was dosimetry distributed in a timely manner?
 - Was dosimetry distributed appropriately to read identified exposure limits?
 - Did workers receive personal dosimetry or group dosimetry?
- Adequately distribute radioprotective drugs to emergency workers.
 - Were radioprotective drugs distributed in a timely manner?
- Record and report exposures in the field.
 - Did workers read and record dosimetry on a regular basis?
 - At what frequency were readings recorded?
 - To who were the readings reported?

- Who briefed emergency workers? Did the briefing include the following:
 - Ensuring dosimetry are zeroed or initial reading is recorded.
 - Frequency to read and record dosimeters.
 - The process of reporting exposures.
 - Proper placement of dosimeters.
 - Proper use of PRDs.
 - Ingestion and documentation of radioprotective drugs.
 - Potential adverse effects of radioprotective drugs.
 - The location to report to for monitoring and decontamination.
- Implement decisions to administer radioprotective drugs.
 - What was the quantity of the inventory of radioprotective drugs and the expiration date?
 - Was the available quantity of radioprotective drugs sufficient to support the number of emergency workers?
 - Was the supply of radioprotective drugs stored according to manufacturer recommendations?
 - How was the ingestion of radioprotective drugs documented?
 - Did emergency workers have a basic knowledge of procedures for ingesting and recording the use of radioprotective drugs, even if the scenario did not drive its use?
 - How were records of exposure and ingestion of radioprotective drugs maintained?
 - Did plans/procedures include a mechanism for identifying an emergency worker who has declined to take radioprotective drugs in advance? If so, how was this documented?
- Report to individual responsible for managing exposure and dose when limits are reached.
 - What was the identified exposure limit?
 - What was the dosimeter correction factor and how was it communicated to emergency workers?
 - What is the process for receiving approval for exceeding exposure limits and dose limits?
 - Who authorized emergency workers to exceed limits or replace a worker who has reached exposure limits?
 - Who coordinated with offsite emergency workers who were performing duties onsite?
- Implement exposure control decisions to members of the public from radiological exposure and control dose for those who are authorized to temporarily reenter a restricted area.
 - What exposure control decisions were implemented to members of the public? What was the control dose for those who were authorized to temporarily reenter a restricted area?

Objective 3: Alert and Notification

Capability Target 3.1: Communications

Communication processes, systems, and equipment are sufficient to support emergency operations.

Intent: The capability to provide and maintain reliable communications with emergency personnel.

Planning reference: NUREG-0654/FEMA-REP-1, Rev. 2 (E.1.a, E.3, F.1, F.1.a, F.1.b, F.1.c, F.3, and O.1)

Core Capabilities: Operational Communications; Operational Coordination; Situational Awareness; Planning

ASSESSMENT – DEMONSTRATION AND EVALUATION GUIDANCE

By observing the OROs' capability to address the appropriate bullet points below and while considering the overall capability being assessed, the following key points of review and associated questions should be considered and will support an evaluation of this capability target.

ORO demonstrate the capability to:

- Utilize communication systems that are fully functional, continuously available, and redundant.
 - What types of communications system(s) and method(s) were available? Which were demonstrated?
 - Was the communication system(s) fully functional?
 - Did personnel demonstrate familiarity of use with each system/method?
 - Was a communications check with other jurisdictions, field teams, and/or other support organizations required and completed?
- Maintain periodic test results and corrective actions on a real time basis.
 - How were test results and corrective actions tracked in real time?
 - Was documentation of the test results and/or corrective actions made available?
- Access at least one communication system that is independent of the commercial telephone system.
 - Which communication system(s) available was independent of commercial telephone?
 - Was it able to be accessed/utilized?
- Manage the communication systems and ensure that all message traffic is handled without delays that might disrupt emergency operations.
 - Were there any delays in message traffic that disrupted emergency operations? If so, how were the delays addressed/mitigated?
- Identify and address any failures of the systems.
 - Were there any communication failures? If so, how was the failure identified?
 - What actions were taken to correct the failure and/or how was the failure overcome?
 - Did the failure affect overall performance?
- Transmit, receive, and understand messages (i.e., “content check”).
 - Were the messages transmitted/received understood by personnel?
 - What was the message?
 - Was a “content check” (i.e., informational message that could be received during an actual radiological emergency) performed?

Capability Target 3.2: Alert and Notification of the Public

Alert and notification of the public is completed in a timely manner.

Intent: The capability to provide instructions to the public.

Planning reference: NUREG-0654/FEMA-REP-1, Rev. 2 (E.2, E.4, E.5, F.3, and O.1)

Core Capabilities: Public Information and Warning; Planning

ASSESSMENT – DEMONSTRATION AND EVALUATION GUIDANCE

By observing the OROs' capability to address the appropriate bullet points below and while considering the overall capability being assessed, the following key points of review and associated questions should be considered and will support an evaluation of this capability target.

ORO demonstrate the capability to:

ALERT AND NOTIFICATION SYSTEM

- Sequentially provide an alert signal followed by an initial instructional message to populated areas.
 - Who has releasing authority of initial EAS or other notification method messaging?
 - Who made the decision to activate the alert and notification system?
 - What process is followed to activate the system?
 - Who activated the system?
 - What alert method(s) was used (siren-system, tone-alert radio, route alerting, telephone, Telecommunication Device for the Deaf/TeleType [TDD/TTY], etc.)?
- Alert and notify the general public.
 - Was the same method used for approving and releasing subsequent alert and notification as the initial alert/notification?
 - What alert method(s) was used (siren-system, tone-alert radio, route alerting, telephone, TDD/TTY, etc.)?
 - What message was sent out? Was it pre-scripted?
 - How often were messages repeated?
 - Conduct initial messaging with, at a minimum, the following four essential elements in the message:
 1. Identification of the ORO responsible and the official with authority for providing the alert and instructional message;
 2. Identification of the commercial NPP and a statement that an emergency exists there;
 3. Reference to REP-specific emergency information (e.g., brochures, calendars, and/or online information) for use by the general public during an emergency;
 4. 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.
- Identify and address any failures of the system(s) or portion of a system(s).
 - Were there any failures of the system or a portion(s) of the system?
 - How were any failures of the system or a portion(s) of the system identified?
 - Was the failure attributed to a specific portion of the plume and/or ingestion exposure pathway EPZ or segment of the population? How?

- What alternate means of alert and notification (e.g., simultaneous or concurrent failure models have overlapping systems which will seamlessly address failures; activation of additional system(s); route alerting; etc.) was utilized for the area of the plume and/or ingestion exposure pathway EPZ or segment of the population affected by the failure(s)? How were the alerts/notifications provided? What was the message?
- Once the failure was identified, what actions were taken?
- If message dissemination is identified as not being accomplished in a timely manner, what was the specific delay? What caused the message to not be provided in a timely manner?
- Actual testing of the mobile public address system will be conducted at an agreed-upon location.
 - What notification methods were tested?
 - How does the notification system deliver messages (e.g., via phone call, text message, and email based on a database of contact information associated with physical addresses)?
 - How, and how often, is the system tested?

EAS

- Identify the process to activate the EAS.
 - What protocol or system was used to activate the EAS? (i.e., software, NWS, radio station, IPAWS)
 - How long did the process take to activate the system?
 - If NWS or radio station was used, was there verification between the ORO and the broadcast station of the EAS message prior to broadcast?
- Ensure that updated emergency information is disseminated in a timely manner.
 - Were messages updated to relay the most current information concerning the incident?
- Ensure that current emergency information is repeated at pre-established intervals.
 - What are the pre-established intervals?
 - How often was information repeated?

EAS/NWS STATION

- Identify the process to activate the EAS, to include the process to receive and then broadcast updated information/ messages and verification of the message, if applicable.
 - Did the station have a copy of current plans, procedures, and messages?
 - Did station staff demonstrate the process to broadcast messages?
 - If required, did the EAS station verify who the message came from and that it is the correct message?
 - Was the EAS station kept updated with new information and messages? How?
- Broadcast the message on a 24-hour basis.
 - What is the 24-hour capability of this location?
 - Is there back-up power supply or is an alternate station used?

ROUTE/ALTERNATE ALERTING

- Complete route alerting, whether because of failure for system/portion of a system or for exception areas, as needed to demonstrate all routes are capable of being run in allotted time. Emphasis on the most challenging routes and demonstration of these routes will be varied from assessment activity to assessment activity. Challenging routes are

defined as those that may be difficult to accomplish, such as those that are lengthy or with conditions (physical or otherwise) that may affect the speed and accuracy with which the route can be completed (e.g., traffic patterns and/or capacity, road conditions, etc.).

- Why was route/alternate alerting initiated?
- Was this a FEMA-approved exception area?
- What organization(s) are responsible for providing route/alternate alerting?
- Under what conditions was route/alternate alerting initiated?
- Who notified the resources to begin route/alternate alerting? How were they notified?
- What resources provided route/alternate alerting?
- How long did it take to complete the route/alternate alerting?
- How was the message announced? What was the content of the message?
- For exception area notification, was it completed within 45 minutes of the initial decision by authorized offsite emergency officials to notify the public of an incident?
- What system was used for exception areas?
- Who approves the use of the system for alerting exception areas?
- Who deployed the system for alerting exception areas and what was the process?
- Can individual sub-areas be activated using the system to alert FEMA approved exception areas?
- Was a test done or was a previous tests report used as confirmation of operation in alerting exception areas?

Capability Target 3.3: Emergency Information and Instructions for the Public and News Media

Accurate emergency information and instructions are provided to the public and the news media in a timely manner.

Intent: The capability to disseminate emergency information and instructions to the public during all phases of an incident.

Planning reference: NUREG-0654/FEMA-REP-1, Rev. 2 (E.2, E.4, E.5, G.1, G.2, G.3, G.3.a, G.4, G.5, and O.1)

Core Capabilities: Public Information and Warning; Planning

ASSESSMENT – DEMONSTRATION AND EVALUATION GUIDANCE

By observing the OROs' capability to address the appropriate bullet points below and while considering the overall capability being assessed, the following key points of review and associated questions should be considered and will support an evaluation of this capability target.

ORO demonstrate the capability to:

PLUME PHASE

- Deliver coordinated, prompt, reliable, and actionable information in a timely manner.
 - Who approves the message content and authorizes the release of the message?
 - Was messaging coordinated with appropriate Federal, state, local, and tribal stakeholders prior to dissemination?
 - Were methods consistent with an established JIS?
 - How often was emergency information repeated?

- Provide clear, concise, accessible messaging using plain language.
 - Was language clear, concise, accurate, and delivered in a timely manner?
 - Was the PAD correctly and appropriately reflected?
 - Was the ECL appropriately disclosed and adequately explained?
 - When needed, were familiar landmarks and boundaries to describe protective action areas?
 - Was there a closing statement included in the messaging? If so, what was it? How was it communicated to affected and/or potentially affected populations?
- Messaging addresses appropriate cultural and linguistic considerations.
 - Is public information required to be available in non-English languages at this location/site? If so, how were messages translated and/or provided?
 - How are those with access and/or functional needs provided with messages and actionable information?
 - Are there any cultural and/or other linguistic considerations relevant for this area? If so, what are they and how were they implemented?
- Ensure subsequent messaging is consistent with protective actions.
 - Are 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 access and/or functional needs, and public inquiry hotline telephone number) to assist the public in carrying out the PADs provided?
 - Was messaging consistent with protective actions?
- Update information as the incident progresses, to include validating previously identified protective areas and clearly identifying any new protective action areas, any information that is no longer valid, and any changes to previously provided information (e.g., rerouting of evacuation routes due to impediments, etc.).
 - How often was information on the incident progression updated?
 - What new protective action areas were identified?
 - How was invalid information rescinded?
 - How was invalid information updated to reflect any changes?
 - Was follow-up and additional messaging coordinated and delivered? How?
- Respond to media and public inquiries.
 - Were the appropriate PIOs or subject matter experts (SMEs) available?
 - How did PIOs or SMEs gather and verify information?
 - How did PIOs or SMEs coordinate information with appropriate personnel for approval?
 - How was exchange, discussion and coordination of information among PIOs or SMEs conducted?
 - Were media briefings conducted? If so, were they frequent, timely, and was information disseminated accurately?
 - Were media and public inquiries handled and addressed appropriately?
 - Were trends and/or rumors captured and addressed in media releases?

POST-PLUME PHASE

- Rapidly disseminate of ingestion exposure pathway information to predetermined individuals and businesses.
 - Where there any delays or reasons why messages were not timely?
- Provide information to the public that addresses temporary reentry to a restricted area, permanent relocation from areas not evacuated, and return to formerly restricted areas will be communicated.
 - What sort of information was provided to the public addressing temporary reentry into a restricted area, permanent relocation of areas not evacuated, and return to formerly restricted areas? How was the information communicated?

Objective 4: Detect, Measure, Sample, Analyze, and Assess

Capability Target 4.1: Field Monitoring Teams Management

FMTs are managed to obtain information to help characterize the release, locate and track the airborne radiological plume, and control contamination.

Intent: The capability to provide overall management of FMTs to direct movements and measurements to characterize the plume and its impacts.

Planning reference: NUREG-0654/FEMA-REP-1, Rev. 2 (H.11, H.13, I.5, I.6, I.9, I.10, M.7, M.8, and O.1)

Core Capabilities: Operational Coordination; Environmental Response/Health and Safety; Planning

ASSESSMENT – DEMONSTRATION AND EVALUATION GUIDANCE

By observing the OROs' capability to address the appropriate bullet points below and while considering the overall capability being assessed, the following key points of review and associated questions should be considered and will support an evaluation of this capability target.

ORO demonstrate the capability to:

- Brief FMTs on predicted plume location and direction, plume travel speed, equipment operational checks, background measurement, and exposure control procedures before deployment.
 - What instructions or assignments were given to the FMT?
 - Who briefed the FMTs prior to deployment? Was the pre-deployment briefing adequate? Did it address predicted plume location and direction, plume travel speed, and exposure/contamination control procedures before deployment?
- Direct the FMTs to monitoring locations, predesignated points or otherwise, at times and locations sufficient to characterize the plume.
 - Who controlled the FMTs' movement and determination of sample location?
 - Were FMTs directed to locations at times sufficient to characterize the plume?
 - What approach was used to select appropriate sampling locations, pre-designated sampling points, or plume traverse (while maintaining specified exposure limits)?
 - What time were assignments completed?
 - During a HAB incident, were there provisions for the field team management to inform Incident Command of FMT activities and location? Was this activity observed?
- Obtain peak plume measurements from FMTs.
 - Which agency's (i.e., ORO, licensee, or other) FMTs were assigned the responsibility of finding the plume edge, obtaining peak measurements in the plume, and obtaining maximum radiation readings in the downwind areas (e.g., centerline measurements)?
- Direct FMTs to collect air samples at locations and times sufficient to characterize the plume.
 - How were locations at which to collect air samples selected?
 - Were the samples taken sufficient to characterize the plume?
- Keep Incident Command informed of FMTs activities and location(s) during a HAB incident or other instances when an ICP or other may be in use.
 - How were activities and locations communicated with Incident Command during a HAB incident?

- Coordinate and share information amongst all FMTs (licensee, Federal, state and local).
 - Did all FMTs (i.e., licensee, Federal, and ORO) share and coordinate plume measurement information?
 - Did the ORO coordinate or use any resources from other agencies, e.g., Federal, mutual aid, or compact?
- Coordinate sample analysis from field to those responsible for assessing radiological data.
 - How was field data coordinated with dose assessors or those responsible for assessing radiological data?
- Coordinate transfer of sample media to locations and organizations responsible for assessing radiological data.
 - Did coordination concerning transfer of samples, including a chain-of-custody form(s), to a radiological laboratory or laboratories occur?
- Assist with development and modification of sampling plans, as appropriate.
 - How were sampling plans developed and maintained?

Capability Target 4.2: Plume Phase Measurements and Sampling

FMTs make, record, and report measurements of ambient radiation to appropriate authorities; radioiodine and particulate samples are collected.

Intent: The capability to make and report measurements of ambient radiation.

Planning reference: NUREG-0654/FEMA-REP-1, Rev. 2 (H.9, H.11, H.11.a, H.11.b, H.12, H.13, I.2, I.5, I.6, I.7, I.8, I.9, I.10, and O.1)

Core Capabilities: Environmental Response/Health and Safety; Planning

ASSESSMENT – DEMONSTRATION AND EVALUATION GUIDANCE

By observing the OROs' capability to address the appropriate bullet points below and while considering the overall capability being assessed, the following key points of review and associated questions should be considered and will support an evaluation of this capability target.

ORO demonstrate the capability to:

- Maintain emergency equipment including calibration and operational checks according to manufacturer's specifications or per national standards.
 - Did each FMT perform an operational check on each radiation survey instrument, including a source-response check which is compared to a known range of readings to confirm the instrument can properly measure radiation?
 - Did each FMT obtain a background radiation measurement with each radiation survey instrument before entering the affected area?
- Maintain inventory for emergency kits.
 - Were kits inventoried prior to deployment?
 - Did kits contain supplies and equipment sufficient to support field team operations?
- Operate and monitor radiation survey instruments to detect changes in radiation exposure rate while moving and in stationary positions.
 - Did FMTs operate and monitor survey instruments continuously and in a way that prevented inadvertent exposure to an active plume?

- Use appropriate contamination control and PPE.
 - Did field teams use appropriate contamination control techniques?
 - What PPE was used?
 - How was instrumentation protected from contamination?
- Be in location(s) at the appropriate time(s) to detect and characterize the active release (plume).
 - What agencies participated as part of the FMT?
 - Were field teams moved to potential locations where the plume was predicted to pass?
- Obtain peak plume measurements either directly or from licensee field teams.
 - Were peak plume measurements obtained? If so, from where?
- Correctly interpret survey instrument readings to determine submersion in the active plume.
 - What exposure rate did FMTs use to determine the possible edge of the plume?
 - Did FMTs compare waist high open-window and closed-window exposure rates to determine submersion in an active plume?
 - Did FMTs take samples? What samples were taken?
 - Did field team record and report area surveys (ambient exposure rates) at multiple locations?
- Collect representative air samples in the active plume on particulate media (e.g., glass or paper filter) and iodine selective media (e.g., silver zeolite cartridge).
 - Was air sampling accomplished at a flow rate between 1.5 cfm and 2 cfm to maintain maximum collection efficiencies of the particulate and iodine sampling media?
 - Was the ambient exposure rate monitored to note changes during air sampling? How often was the ambient exposure rate noted (e.g., beginning, mid-sampling, end-of-sampling, or continuously monitored)?
- Handle sample media and equipment to avoid sample cross-contamination, contamination of equipment and personnel contamination.
 - What methods were used to prevent sample cross-contamination?
 - How were instruments and equipment used for sample counting handled to prevent spread of contamination?
 - How was radiologically contaminated waste handled?
- Determine an appropriate low background location to count sample media.
 - What was the background counting rate in the low background location selected to count the samples in the field?
- Count iodine and particulate media using appropriate and effective instrumentation and counting geometries or have samples analyzed by a supporting laboratory within four hours.
 - What instrument was used to count the media in the field?
 - What means were used to ensure an effective, repeatable counting geometry?
 - If samples were not counted in the field, what was the dedicated transportation means that ensured samples were analyzed by the supporting laboratory within four hours?
- Report to field monitoring team manager all survey and counting results in format and units suitable for use by the organization's dose assessor.
 - Were results of surveys and, if taken, field results from air samples documented? How were they transmitted?

- Procedures, qualified collection and counting efficiencies, and calculations are capable of detecting airborne radioactive iodine concentrations as low as 10^{-7} $\mu\text{Ci/cc}$.
 - Were the flow rate, sample volume, counting efficiencies, and appropriate calculations performed to prove the ability to detect concentrations as low as 10^{-7} Ci/cc ?
- Preparation of packaging, sample identification, and chain-of-custody forms ensures integrity of samples throughout transportation and transfer.
 - Was packaging and handling adequate to prevent cross-contamination?
 - Was sample identification and chain-of-custody completed to maintain integrity of the samples?

Capability Target 4.3: Post-Plume Phase Measurements and Sampling

FMTs take measurements and samples to support assessment of the ingestion exposure pathway and to support reentry, relocation, and return decisions.

Intent: The capability to report measurements of ambient radiation and collect environmental, food, and drinking water samples for laboratory analyses that support decision-making.

Planning reference: NUREG-0654/FEMA-REP-1, Rev. 2 (H.11, H.11.a, H.11.b, H.12, H.13, I.2, I.5, I.6, I.8, M.7, and O.1)

Core Capabilities: Environmental Response/Health and Safety; Planning

ASSESSMENT – DEMONSTRATION AND EVALUATION GUIDANCE

By observing the OROs' capability to address the appropriate bullet points below and while considering the overall capability being assessed, the following key points of review and associated questions should be considered and will support an evaluation of this capability target.

ORO demonstrate the capability to:

- Maintain and prepare instruments, equipment, and supplies for use, including performing pre-operational checks of radiation survey instruments.
 - Did each FMT perform an operational check on each radiation survey instrument, including a source-response check which is compared to a known range of readings to confirm the instrument can properly measure radiation?
 - Did each FMT obtain a background radiation measurement with each radiation survey instrument before entering the affected area?
- Use appropriate contamination control and PPE.
 - What sort of contamination controls and PPE was utilized?
- Execute the sampling plan.
 - Were samples collected consistent with samples specified in the sampling plan?
- Collect each type of sample necessary to assess the ingestion exposure pathway and to support reentry, relocation, and return decisions. The types of samples necessary are based on the exercise scenario and may include drinking water, soil, vegetation, milk, crops, or other agriculture samples.
 - Which types of samples did FMTs collect?
 - Were samples collected at the locations identified by the field team manager?
 - Did each FMT follow the appropriate procedure for collecting each type of sample?

- Obtain and record ambient radiation measurements at each sample location and at other locations, as directed.
 - Was an ambient radiation measurement taken at each sample location?
- Handle sample media to avoid sample cross-contamination and equipment/personnel contamination.
 - Did each FMT properly package each sample?
 - What precautions were taken to prevent cross-contamination of samples?
 - Did each FMT properly document each sample?
 - Was a chain-of-custody record created?
 - Was each sample assigned a unique identification number?
- Prepare and package samples appropriately (e.g., geometries specific to those used in the processing samples, including sample identification, and chain-of-custody forms) to ensure the integrity of samples throughout transportation and transfer.
 - Did each FMT properly document each sample, including creating a chain-of-custody record? Was each sample assigned a unique identification number?
 - Were samples collected by the ORO at a central location (e.g. sample control point) or delivered directly to the laboratory?
 - Did sample control point personnel follow appropriate procedures for receiving samples?
 - Were chain-of-custody records properly maintained?
 - How were samples transported to the laboratory?
 - Were any samples identified as having exposure rates or contamination levels too high to be accepted by a particular laboratory? If so, what was done with those samples?

Capability Target 4.4: Laboratory Operations

The laboratory performs radiological analyses to support protective action decision-making.

Intent: The capability to perform laboratory analyses of radioactivity in environmental, food, and drinking water samples to support decision-making.

Planning reference: NUREG-0654/FEMA-REP-1, Rev. 2 (C.4, H.11, H.11.b, H.13, I.2, I.6, M.7, and O.1)

Core Capabilities: Environmental Response/Health and Safety; Planning

ASSESSMENT – DEMONSTRATION AND EVALUATION GUIDANCE

By observing the OROs' capability to address the appropriate bullet points below and while considering the overall capability being assessed, the following key points of review and associated questions should be considered and will support an evaluation of this capability target.

ORO demonstrate the capability to:

- Prepare analytical equipment for use, including performing calibrations, quality control checks, and background counts, as appropriate.
 - Was the equipment used calibrated using standards traceable to the National Institute of Standards and Technology (NIST) in the appropriate geometries? Were quality control checks and background counts performed in accordance with procedures?

- Receive and track samples, including completing chain-of-custody records.
 - Did laboratory personnel follow their procedures for receiving samples?
 - Were samples properly documented, including completing chain-of-custody records?
 - How were samples tracked throughout the analysis process?
- Prepare and process each type of sample necessary to assess the ingestion plume exposure pathway and to support reentry, relocation, and return decisions. The types of samples necessary are based on the exercise scenario and may include drinking water, soil, vegetation, milk, crops, or other agriculture samples.
 - Which types of samples (e.g., air cartridge and filter, soil, vegetation, water, milk, crops, etc.) did the laboratory have the capability to analyze? What samples were processed during the demonstration?
 - Did laboratory personnel follow their procedures for sample preparation? What measures were taken to control contamination?
- Analyze samples to determine the concentration of each radionuclide in each sample. Minimum detection limits (MDLs) for various radionuclides must be low enough to support ORO decisions.
 - Did the gamma spectroscopy systems use high-purity germanium detectors or another type? Did the software library include the radionuclides expected to be released during a nuclear power plant incident?
 - Did the laboratory have the capability to analyze samples for strontium-90? If so, how long would that analysis take? If not, did the ORO have plans in place to obtain such analysis?
 - What count times were used? Were the MDLs for various radionuclides low enough to support ORO decisions?
 - For food and milk samples, were the MDLs less than the FDA DILs?
 - For soil samples, were the MDLs low enough to support relocation decisions?
 - For drinking water samples, were MDLs lower than the EPA DRLs?
 - Did the laboratory have radiation level or contamination level limits for incoming samples? If so, what happens to samples exceeding those limits?
 - How many samples could the laboratory process in one day and in what order would samples be processed? Did the ORO have a method to identify priority samples?
 - How would samples be stored after counting is completed? What methods would be used to prevent spoilage of perishable samples? Were storage locations shielded or located far enough away to prevent increased radiation levels near the counting equipment?
- Provide analysis results to the appropriate organization.
 - How were counting results processed and reported to the ORO? Were results reported in appropriate units (e.g., soil sample results reported in units of activity per area, not in units of activity per weight)? Were results decay corrected to the sample collection time or to another time? Were results transmitted electronically or by hard copy?
- If the laboratory is used to count air samples during the early phase of an incident and prepare, process, and analyze air filters and cartridges, provide analysis results in a timely manner to support ORO decisions.
 - If the laboratory would be used to count air samples during the early phase of an incident, what would be the approximate time from when a sample is collected by FMTs to when the results would be provided to the ORO?

Capability Target 4.5: Plume Phase Analysis and Dose Assessment

Dose assessment considers all available information including plant conditions, environmental conditions, field monitoring data, sample analysis results, and dose projection calculations.

Intent: The capability to collect data, project doses to members of the public and emergency workers, and analyze and communicate the results.

Planning reference: NUREG-0654/FEMA-REP-1, Rev. 2 (A.3, H.13, I.6, I.8, I.10, K.3, and O.1)

Core Capabilities: Environmental Response/Health and Safety; Planning

ASSESSMENT – DEMONSTRATION AND EVALUATION GUIDANCE

By observing the OROs' capability to address the appropriate bullet points below and while considering the overall capability being assessed, the following key points of review and associated questions should be considered and will support an evaluation of this capability target.

ORO demonstrate the capability to:

- Obtain adequate data to make dose projections.
 - What information was used to make dose projections?
 - Did the information include information/recommendations of the licensee, release data, and meteorological data?
- Use software and/or other methods (e.g., manual calculations) to make dose projections for members of the public (both TED and thyroid dose) based on plant data.
 - What modeling system was used to make dose projections?
 - Did the ORO demonstrate the capability to use other methods, such as manual calculations?
- Compare dose projections to members of the public to EPA PAGs.
 - Did the ORO make TED and thyroid dose projections available to members of the public based on information/recommendations of the licensee, release data, and meteorological data?
 - Did the ORO compare dose projections to EPA PAGs and make PARs?
- Compare dose projections to the public with those of the licensee and discuss differences greater than a factor of ten with the licensee and explain reasons for the difference.
 - Were differences in dose projection greater than a factor of ten discussed with the licensee? If so, were the differences resolved and considered in the PAR?
- Make initial PARs based on recommendations of the licensee, release data, meteorological data, and other pertinent information.
 - Were initial PARs based on recommendations from the licensee, release data, meteorological data, and any other pertinent information? If not, what were the initial PARs based on?
- Promptly communicate PARs to decision-makers.
 - How were PARs communicated to decision-makers?
 - How quickly were PARs communicated to decision-makers?
- Receive ambient exposure rates from FMTs and compare to model projections.
 - Were ambient exposure rates received from FMTs and compared to modeled exposure rates?

- Calculate iodine and particulate concentrations from FMT air samples.
 - Did the ORO calculate iodine and particulate concentrations from FMT air sample data?
- Calculate plume ratios of noble gas, iodines, and particulates, and compare to model projections.
 - Did the ORO calculate iodine and particulate concentrations from FMT air sample data?
- Adjust PARs, as necessary, based on analysis of field data.
 - Did the ORO adjust PARs based on exposure rates measured by iodine and particulate ratios calculated from air samples collected by FMTs?
- Calculate an incident-specific correction factor for emergency workers inside the plume exposure pathway EPZ.
 - Did the ORO calculate an incident-specific correction factor for emergency workers inside the plume exposure pathway EPZ?
 - Was the correction factor adjusted for emergency workers inside the plume exposure pathway EPZ based on air sample data collected by FMTs?
 - Was the incident-specific correction factor communicated to emergency workers inside the plume exposure pathway EPZ?

Capability Target 4.6: Post-Plume Phase Sampling Plan Development and Analysis

Post-plume phase assessment considers all available information, including environmental conditions, field monitoring data, sample analysis results, and dose projection calculations.

Intent: The capability to identify and prioritize sampling, collect data, determine areas where relocation is recommended, identify food that is contaminated above federally approved limits, and analyze and communicate the results.

Planning reference: NUREG-0654/FEMA-REP-1, Rev. 2 (A.3, H.13, I.2, I.6, I.8, I.10, J.12, J.14.b, J.14.c, K.3, M.7, M.8, and O.1)

Core Capabilities: Environmental Response/Health and Safety; Planning

ASSESSMENT – DEMONSTRATION AND EVALUATION GUIDANCE

By observing the OROs' capability to address the appropriate bullet points below and while considering the overall capability being assessed, the following key points of review and associated questions should be considered and will support an evaluation of this capability target.

ORO demonstrate the capability to:

- Periodically conduct radiological assessment of public exposure.
 - What methods were used to assess public exposure and at what frequencies?
- Estimate projected doses in contaminated areas and identify areas where projected doses exceed relocation PAGs.
 - Did the ORO calculate projected doses based on laboratory analyses of soil samples?
 - Did the ORO calculate a DRL for relocation for each area with a homogeneous radionuclide deposition mixture?
 - Were areas exceeding DRLs identified?
- Develop and modify sampling plan to assess the radiological consequences of a release on the food and drinking water supplies.
 - How was the area of interest identified (e.g., depositions footprint)?

- Did the ORO's assessment include an evaluation of the radiological analyses of representative samples of drinking water, food, and other ingestible substances of local interest from potentially impacted areas?
- Did the ORO's assessment include a characterization of the releases from the facility?
- Did the ORO's assessment include the extent of areas potentially impacted by the release?
- Determine areas to be restricted based on factors such as mix of radionuclides in deposited materials, calculated exposure rates compared to PAGs, and analysis of vegetation and soil samples.
 - How were the boundaries of the deposition determined?
 - If deposition boundaries were determined by projections, how were the projected areas verified (e.g., field measurements, environmental sampling)?
- Evaluate the radiological analyses of representative samples of drinking water, food, and other ingestible substances of local interest from potentially impacted areas.
 - Were the pre-determined DILs the same as the 1998 FDA DILs? If not what, were the differences? If other than the FDA DILs were used, what rationale was given for other decision criteria?
 - What projected doses were used to recommend protective actions for food, drinking water, and persons being relocated?
- Compare radiological impacts of analysis on food and water and other representative samples to appropriate ingestion PAGs.
 - Did the ORO demonstrate the capability to obtain sample results from the specified laboratory?
 - Were results reported in appropriate units? (e.g., were soil sample results reported in units of activity per area—not in units of activity per weight?)
 - Were results decay corrected to the sample collection time or to some other time?

Objective 5: Operate

Capability Target 5.1: Monitoring, Decontamination, Sheltering, and Registration of Evacuees

Facilities, equipment, and procedures are in place and utilized to provide monitoring, decontamination, identification, temporary shelter, congregate care, and registration of evacuees.

Intent: The capability to implement radiological monitoring and decontamination of evacuees, and to identify, register, temporarily shelter, and provide congregate care for evacuees at reception centers.

Planning reference: NUREG-0654/FEMA-REP-1, Rev. 2 (J.11.d, J.13, K.4, and O.1)

Core Capabilities: Operational Coordination; Environmental Response/Health and Safety; Mass Care; Planning

ASSESSMENT – DEMONSTRATION AND EVALUATION GUIDANCE

By observing the OROs' capability to address the appropriate bullet points below and while considering the overall capability being assessed, the following key points of review and associated questions should be considered and will support an evaluation of this capability target.

OROs demonstrate the capability to:

- Set-up operations.
 - Was the facility set up and operational? Did it include route markings, instrumentation, record keeping, and contamination control measures?
 - Where did monitoring, decontamination, and registration of evacuees occur?
 - How was contamination minimized within the facility? What contamination control provisions were utilized?
 - What supplies were available to set up the facility?
 - What supplies were available to prevent and control spread of contamination?
 - What personal protective supplies were available?
- Operationally check instruments and equipment.
 - What types of monitoring instruments and equipment were available?
 - Were the instruments current in calibration?
 - Were instruments and equipment operationally checked using an appropriate check source against a known range of reading to verify proper operation?
 - Was an appropriate radioactive check source used to verify proper operational response for each low-range radiation measurement instrument?
 - Were background readings taken?
 - How were background radiation levels established?

MONITORING

- Attain and sustain the overall monitoring productivity rate per hour needed to monitor 20 percent of the plume exposure pathway EPZ population, including transients, within a 12-hour period at each facility. The monitoring productivity rate per hour is the number of evacuees that can be monitored, per hour, per location, by the total complement of monitors using an appropriate procedure.
 - What is the total population, including transients, of the plume exposure pathway EPZ? What is 20 percent of that figure (the estimate of needed monitoring capability)?

- What was the time for monitoring sequences for the first six simulated evacuees, per monitoring team (determine percentage)?
- Were evacuees monitored using hand-held survey instruments or portal monitors?
- If portal monitors were used, was a body survey made after triggering the portal monitor using hand-held instrument to locate, quantify, and isolate the exact location of the contamination?
- Where were portal monitors used?
- Was a minimum of six simulated evacuees and one-third of the equipment (at that facility) demonstrated?
- Was the monitoring sequences for these simulated evacuees timed by the evaluators to determine whether the monitoring productivity rate per hour can be met?
- Was the facility able to maintain the rate to monitor 20 percent?
- Based on the demonstration, was the facility able to monitor 20 percent of anticipated evacuees within 12 hours? At this rate, is the facility going to meet the 20 percent goal?
- Monitor evacuees, service animals, pets, vehicles, and possessions.
 - Was there an adequate number of personnel available to perform monitoring of vehicles and evacuees?
 - What are the provisions for monitoring service animals and pets?
 - What were the provisions for individuals who had completed monitoring (and decontamination, if needed)?
 - What means were used to indicate that evacuees, and their service animals, pets, possessions, and vehicles, have been monitored, cleared, and found to have no contamination or contamination below the trigger/action level indicated (e.g., hand stamp, sticker, bracelet, form, etc.)?
- Utilize trigger/action levels for determining the need for decontamination.
 - Did monitoring personnel use trigger/action levels to determine the need for decontamination?
 - What trigger or action levels were identified?

DECONTAMINATION

- Decontaminate evacuees, and personal belongings, while limiting the spread of contamination.
 - What provisions were in place to ensure privacy?
 - What is the process for providing modesty garments to evacuees?
 - How was decontamination conducted for small areas of contamination?
 - How were contaminated individuals separated from non-contaminated individuals?
 - How are contaminated clothing and other personal belongings handled?
 - What contamination control procedures were utilized?
 - Were provisions made to collect contaminated waste and to prevent it from increasing the background radiation levels near portal monitors and survey equipment?
 - What is the process to indicate that an individual has been monitored and, if necessary, decontaminated (e.g., hand stamp, sticker, bracelet, form, etc.)?
- Follow-up with any evacuee(s) who cannot be appropriately decontaminated for assessment; ensure the capability to provide evacuee-referrals.
 - What procedures were used if evacuees could not be adequately decontaminated?
 - What was the follow-up and associated assessment process for those evacuees who could not appropriately be decontaminated?

VEHICLES

- Monitor and decontaminate vehicles.
 - How are vehicles monitored? Were the following monitored: air intake systems, radiator grills, bumpers, wheel wells, tires, and door handles?
 - What procedures were demonstrated for vehicle monitoring?
 - Was at least one vehicle monitored?
 - Was there adequate space for the expected number of vehicles (space must be observed by evaluator)?
 - How are vehicles decontaminated?
 - What contamination control procedures were utilized?
- Provide adequate, separate space for both contaminated and non-contaminated vehicles.
 - Was there appropriate space for vehicle parking of both contaminated and non-contaminated vehicles?
 - How were non-contaminated vehicles separated from contaminated or not-yet-monitored vehicles?
- Monitor emergency worker personnel and their equipment and vehicles for contamination.
 - Was there adequate space for evacuee vehicles at the facility?
 - Were there an adequate number of personnel trained to operate monitoring equipment at the facility?
 - What provisions were in place to ensure privacy?
- Decontaminate evacuee vehicles based on trigger/action levels.
 - What is the action level for determining the need for decontamination of vehicles?
 - What process is used to decontaminate vehicles?
 - What was done when an evacuee's vehicle could not be successfully decontaminated?

SHELTERING & CONGREGATE CARE

- Coordinate for incoming evacuees who have been monitored and, if necessary, decontaminated.
 - How was coordination amongst and between congregate care facilities/mass care for those evacuees that have already been monitored and, if necessary, decontaminated?
 - What identifier was used for those evacuees (and where applicable, service animals, pets, and vehicles) who had been monitored, decontaminated as appropriate, and registered?
- Establish shelter operations.
 - What is the process for determining if evacuees, service animals, and pets had been monitored for contamination, decontaminated as appropriate, and registered before entering the facility?
 - Did the staff check for arriving individual's confirmation of monitoring/decontamination?
 - Did the ORO appropriately plan for the population expected at this location?
- Congregate care centers and operations in host/support jurisdictions are sufficient to support the expected number of evacuees.
 - What agency (or agencies) is responsible for managing the congregate care center?
 - What is the capacity of the congregate care center?
 - What resources were available for evacuees (real or simulated) arriving at the congregate care center?

REGISTRATION

- Register evacuees.
 - What is the process to register evacuees after they have completed the monitoring and decontamination process?
 - Did the record contain the individual's name, address, results of monitoring, and time of any decontamination needed?
 - What organization(s) registered evacuees upon completion of monitoring and decontamination?
 - What is the process for registering evacuees?
 - Was a registration record established for each individual?
- Ensure the registration area is clean and controlled.
 - Was the access to the clean registration area controlled adequately? How?

Capability Target 5.2: Monitoring and Decontamination of Emergency Workers, Equipment, and Vehicles

Facilities, equipment, and procedures are in place and utilized to provide monitoring and decontamination of emergency workers and their equipment and vehicles.

Intent: The capability to implement radiological monitoring and decontamination of emergency workers, equipment, and vehicles.

Planning reference: NUREG-0654/FEMA-REP-1, Rev. 2 (K.4 and O.1)

Core Capabilities: Operational Coordination; Environmental Response/Health and Safety; Planning

ASSESSMENT – DEMONSTRATION AND EVALUATION GUIDANCE

By observing the OROs' capability to address the appropriate bullet points below and while considering the overall capability being assessed, the following key points of review and associated questions should be considered and will support an evaluation of this capability target.

ORO demonstrate the capability to:

- Set-up operations.
 - Where will monitoring and decontamination of emergency workers occur?
 - Where will emergency workers' equipment be monitored and decontaminated?
 - Was the facility set up and operational? Did it include route markings, instrumentation, record keeping, and contamination control measures?
 - What supplies were available to set up the facility?
 - What supplies were available to prevent and control spread of contamination?
 - What personal protective supplies were available?
 - How was contamination minimized within the facility?
 - What contamination control provisions were utilized?
- Operationally check instruments and equipment.
 - Were the instruments current in calibration?
 - Were instruments and equipment operationally checked using an appropriate check source against a known range of reading to verify proper operation?
 - Was an appropriate radioactive check source used to verify proper operational response for each low-range radiation measurement instrument?

- Were background readings taken?
- How were background radiation levels established?
- Monitor emergency worker personnel and their equipment and vehicles for contamination.
 - Was there adequate space for emergency workers at the facility?
 - Were there an adequate number of personnel trained to operate monitoring equipment at the facility?
 - During vehicle monitoring, were the following monitored: air intake systems, radiator grills, bumpers, wheel wells, tires, and door handles?
 - What provisions were in place to ensure privacy?
- Decontaminate emergency worker personnel and their equipment and vehicles based on trigger/action levels.
 - What is the action level for determining the need for decontamination of personnel, equipment, and vehicles?
 - What process is used to decontaminate personnel, equipment, and vehicles?
 - How was decontamination conducted for small areas of contamination?
 - What was done when an emergency worker could not be successfully decontaminated?
- Control the spread of contamination.
 - What procedures are used to minimize contamination within the facility?
 - How are contaminated emergency workers separated from non-contaminated emergency workers?
 - How are contaminated clothing and other personal belongings addressed? Will clean clothing be provided to emergency workers?
 - Were contamination control procedures, including storage of contaminated clothing and possessions followed?
- Create and maintain a record of monitoring and decontaminating workers upon completion of monitoring and decontamination activities.
 - Was a record of monitoring and decontamination (if necessary) kept for each emergency worker?
- Process for prioritizing emergency workers and equipment before the public in facilities where the public and emergency workers are both processed for contamination.
 - What is the process for prioritizing emergency workers and equipment before the public in facilities where the public and emergency workers are both processed for contamination?

Capability Target 5.3: Transportation and Treatment of Contaminated, Injured Individuals

Transport contaminated, injured individuals to medical facilities with the capability to monitor and decontaminate.

Intent: The capability to provide medical transport and treatment services to contaminated, injured individuals.

Planning reference: NUREG-0654/FEMA-REP-1, Rev. 2 (C.2.d, F.2, H.11, H.12, J.2, K.3, K.4, L.1, L.3, L.4, and O.1)

Core Capabilities: Environmental Response/Health and Safety; Public Health, Healthcare, Emergency Medical Services; Planning

ASSESSMENT – DEMONSTRATION AND EVALUATION GUIDANCE

By observing the OROs' capability to address the appropriate bullet points below and while considering the overall capability being assessed, the following key points of review and associated questions should be considered and will support an evaluation of this capability target.

OROs demonstrate the capability to:

TRANSPORTATION

- Transport contaminated, injured individuals to medical facilities.
 - Who dispatched the medical transport provider and what information was provided?
 - Did the appropriate briefings occur? What was contained in the briefings?
 - Which agency or agencies demonstrated the transportation of contaminated, injured individuals to appropriate medical facilities?
 - What type of vehicle was used for the transportation of the contaminated, injured individuals?
 - Was the site of pick-up in a potentially contaminated area? If so, what precautions were taken?
 - How did the medical transport provider know to take radiological precautions with the contaminated, injured individual?
 - Was the contaminated, injured individual monitored for radiological contamination before arrival or during initial evaluation by the transport provider?
 - Who did the monitoring?
 - What survey instruments were used?
 - Were the instruments current in calibration?
 - Did medical care take priority over monitoring?
 - Were instruments and equipment operationally checked using an appropriate check source against a known range of reading to verify proper operation?
 - What contamination control measures were taken by the medical transport crew?
 - How was the patient transferred from the medical transport vehicle to the medical facility?
 - Were accident scene survey records transferred to the medical facility staff? Was the transfer made taking care not to spread contamination?
 - Was the medical transport crew knowledgeable about where the medical transport vehicle (or other transport vehicle) and crew would be monitored and decontaminated?
 - Where and by whom will the medical transport crew and medical transport vehicle (or other transport vehicle) be monitored and decontaminated, if required?
- Maintain communications between the medical transportation provider and the receiving medical facility.
 - What communications occurred between the medical transport crew and the receiving hospital? How?

MEDICAL FACILITY

- Operationally check instruments and equipment.
 - How were background measurements obtained on a continuous basis?
 - What survey instruments were used?
 - Were the instruments current in calibration?
 - Were instruments and equipment operationally checked using an appropriate check source against a known range of reading to verify proper operation?
 - Was an appropriate radioactive check source used to verify proper operational response for each low-range radiation measurement instrument?

- Did the receiving facility personnel don the appropriate PPE in accordance with procedures and in a manner to prevent the spread of contamination?
- Set-up, activate, and operate an REA.
 - How was the hospital notified to establish a REA? With regard to the REA, what information was provided to the medical facility by the medical transport crew?
 - Were staff, equipment, and supplies readily available for monitoring and decontamination, and setting up the REA?
 - How was access into the REA controlled?
 - Did urgent medical care take precedence over monitoring, decontamination, and contamination control efforts by facility medical staff?
 - Who performed and/or supervised treatment of contaminated, injured individuals?
 - What equipment and supplies were available for treatment of contaminated, injured individuals?
 - How were items assured to be free of contamination before they were transferred out of the REA to the clean area?
 - After treatment and decontamination, how was the individual transferred out of the REA?
 - How did the staff exit the REA?
 - Was a doffing procedure correctly implemented?
 - Was the REA, and equipment within, monitored for contamination prior to returning it to normal operations?
- Monitor and decontaminate the individual, equipment, and other items.
 - How were monitoring (i.e., survey measurements and samples) results documented and recorded?
 - Did the medical staff make decisions on the need for decontamination of the individual and follow appropriate decontamination procedures?
 - What contamination threshold triggers the need for decontamination of the individual?
 - What methods were used to decontaminate the potentially contaminated individual (once that person is medically stabilized)? Were decontamination methods progressive (e.g., mild decontamination used prior to scrubbing)?
 - What procedure was used if decontamination was not successful?
 - What methods were used to collect and analyze samples, including swabs and skin wipes?
 - Who did the monitoring? What equipment was used?
 - What records were maintained with regard to survey and decontamination?
 - What was the procedure for handling, decontaminating, and storage of contaminated items?
 - What was the action level to determine if equipment was contaminated or not?
 - Who decontaminated the equipment and other items?
 - How was waste water from decontamination operations handled?
 - What contamination control measures were taken?

Capability Target 5.4: Traffic and Access Control

Appropriate traffic and access control is established; accurate instructions are provided to traffic and access control staff.

Intent: The capability to select, establish, and staff traffic and access control points and removing impediments to the flow of evacuation traffic.

Planning reference: NUREG-0654/FEMA-REP-1, Rev. 2 (H.12, J.8, J.8.b, J.10, J.10.a, J.11.c, J.11.e, J.11.f, J.14.d, J.14.e, M.1.b, and O.1)

Core Capabilities: Critical Transportation; Access Control/Identity Verification; Environmental Response/Health and Safety; On-Scene Security, Protection, and Law Enforcement; Operational Coordination; Planning; Situational Assessment

ASSESSMENT – DEMONSTRATION AND EVALUATION GUIDANCE

By observing the OROs' capability to address the appropriate bullet points below and while considering the overall capability being assessed, the following key points of review and associated questions should be considered and will support an evaluation of this capability target.

ORO demonstrate the capability to:

- Select, establish, and staff appropriate TCP/ACPs, consistent with current conditions and PADs (e.g., evacuating, sheltering, and relocation), in a timely manner.
 - Were there pre-identified TCPs/ACPs in the plan?
 - What was the basis for determining the location of TCPs/ACPs (e.g., evacuation of area, danger in area, etc.)?
 - At what ECL were TCPs/ACPs established?
 - Who was responsible for establishing traffic routes and/or TCPs/ACPs?
 - Who deployed TCP/ACP personnel to the assigned location?
 - Were necessary resources available when needed?
 - Were there any gaps identified between the TCP/ACP resources needed and the resources available? If so, what alternate resource providers were identified and resources provided?
 - Were TCPs/ACPs identified, staffed, and established in timely manner?
- Provide instructions to TAC staff on actions to take, including when modifications in protective action strategies necessitate changes in evacuation patterns or in the area(s) where access is controlled.
 - Did the TCP/ACP staff receive an emergency worker briefing? If so, what did the briefing include?
 - When PADs expanded into the affected area, were TAC personnel relocated?
 - Were instructions provided to TCP/ACP staff on the modification of PADs?
 - Were TCP/ACP personnel able to provide the following information:
 - Location of TCPs/ACPs.
 - Location of reception/registration centers.
 - Location of emergency worker monitoring and decontamination center.
 - Equipment available (e.g., cones) to establish TCPs/ACPs.
 - The means used to verify emergency worker identification and access.
 - Their roles and responsibilities.
 - What plans/procedures were in place for verifying emergency worker identification and access authorization?

- Contact the state or Federal agencies that have the authority for the different transportation modes (e.g., rail, water, and air traffic).
 - Who notified which agency for control of water, rail, and air traffic?
 - Were times and ECLs documented when rail, water, and air traffic access control were notified by the ORO?
 - What actions were requested? How were actions coordinated?
- Identify and take appropriate actions concerning impediments that affect the evacuation and evacuation routes.
 - Were there impediments to evacuation? If so, where did the impediment occur on the evacuation route? Was the impediment on the evacuation route left in place for the remainder of the demonstration or was it removed?
 - Were appropriate actions for impediments that affected evacuation routes identified?
 - How were the resources to remove impediments to evacuation identified and coordinated? Was this done in a timely manner? What organizations assisted in impediment removal?
- Make the decision to re-route traffic and coordinate with key decision-makers and the JIC to ensure the alternate route information is appropriately communicated to evacuees.
 - What key decision-makers were involved in the coordinated effort to re-route traffic?
 - Who made the decision to re-route traffic?
 - What coordination occurred among various OROs, such as local law enforcement, state law enforcement, National Guard, and/or state and/or local transportation departments?
 - What coordination occurred to alert the public of the need to take an alternate route?
 - How and when was the public alerted to take an alternate route?
 - Were decisions made in coordination with all agencies (both internal and external) involved?
 - Was the messaging coordinated and consistent?
- Establish procedures to control access to and monitor people and vehicles from the evacuated and restricted areas.
 - How did the ORO determine location of ACPs?
 - How was the area identified (e.g., ropes, fences, gates, etc.)?
 - What did the ORO do to control access to the restricted areas?
 - Which agencies have the responsibility to establish procedures to control access to evacuated and restricted areas?
- Authorize reentry of individuals into the restricted areas.
 - What was the process to approve individuals to reenter the restricted areas?
 - How were individuals authorized to reenter the restricted areas?
 - What provisions were made to determine and control their exposure?
 - How were these individuals tracked to ensure they returned out of the restricted areas?
- Establish exit procedures.
 - How were individuals, vehicles, and equipment monitored?
 - What was the decision-making guidance for decontamination?
 - What was the disposition of dosimeters, maintenance of the reentry radiation exposure records of dosimetry, and maintenance of emergency worker radiation exposure records?

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PART IV: FEMA REP Program Administration

INTRODUCTION

The intent of this part of the RPM is to provide general guidance on the FEMA REP Program administrative policies and procedures. Examples provided in Part IV 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 Part IV are:

- A . Approval Process for Alternative Approaches
- B. Emergency Planning Zone Boundary Changes
- C. Credentialing Framework
- D. REP Exercise Process Milestones and Frequencies
- E. Use of State, Local, and Tribal Personnel as REP Exercise Evaluators
- F. Tribal Policies and Procedures
- G. Staff Assistance Visits
- H. Evacuation Time Estimates
- I. Potassium Iodide for the Public
- J. Conducting Plan Reviews
- K. Conducting Scenario Reviews
- L. Annual Letter of Certification
- M. Public Information Review Guide and Process
- N. Preliminary Capabilities Assessment and Disaster-Initiated Review

A. APPROVAL PROCESS FOR ALTERNATIVE APPROACHES

Alternative approaches provide an opportunity for state, local, and tribal governments, applicants, and licensees to meet the planning standards in a manner that is different from what the evaluation criteria recommend within this guidance document. While an alternate approach does not relax the requirements of the planning standards, it provides an opportunity to propose an alternative method for meeting the intent of the planning standards.

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 the following information:

- Jurisdiction(s) affected/involved.
- Relevant evaluation criteria (e.g., evaluation criterion A.1, etc.).
- Explanation regarding how the currently approved approach is not sufficient for the jurisdiction (e.g., statutes and regulations prohibit the currently approved approach, terrain/weather conditions prohibit the use of certain equipment, distance from facilities inhibits response times, etc.).
- A description of an alternative approach that includes sufficient detail and any materials (e.g., forms, SOPs, etc.) necessary to ensure clarity of the alternative approach. The description should also guarantee that 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 review the OROs' proposal and determine whether to endorse the alternative approach; other RAC members may be consulted for additional guidance. The FEMA Regional Office will forward the written recommendation, which should include an explanation of how the recommendation was formulated, along with the proposal, to FEMA Headquarters within 30 days of the initial proposal 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 ORO and determine a mutually acceptable solution. If this approach is not successful, then the FEMA Regional Office sends the proposal to FEMA Headquarters with a written statement explaining why the alternative approach is not endorsed.

3. FEMA Headquarters Approval

Once the proposed alternative approach is received by FEMA Headquarters, the proposal is reviewed by the following:

- FEMA THD Policy and Doctrine Branch
- FEMA Office of the Chief Counsel (OCC)
- FEMA 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 an alternative approach may be accomplished during a biennial exercise, a real-world event, staff 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 necessitates 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 agreement 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, the FEMA Regional Office will need to provide a written report detailing the actions taken and the associated 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.

B. EMERGENCY PLANNING ZONE BOUNDARY CHANGES

In accordance with NUREG-0654/FEMA-REP-1, Rev. 2, plume and ingestion exposure pathway EPZs are areas for which emergency planning is needed to assure prompt and effective actions can be taken to protect the public in the event of a radiological incident. The EPZs associated with each NPP must be defined both for the shorter-term plume exposure pathway and the longer-term ingestion exposure pathway. During a particular radiological incident, protective actions may be restricted to only a portion of the EPZ, while the worst possible radiological incidents may necessitate response activities and protective actions be taken outside the EPZs.

The size of the plume exposure pathway EPZ is based primarily on the following considerations:

- Projected doses from the traditional design basis accidents would not exceed Federal PAG levels outside the EPZ.
- Projected doses from most core melt sequences would not exceed Federal PAG levels outside the EPZ.
- For the worst core melt sequences, immediate life threatening doses would generally not occur outside the EPZ.
- Detailed planning within 10 miles would provide a substantial base for expansion of response efforts in the event that this proved necessary.

The size of the ingestion exposure pathway EPZ was based on the following considerations:

- The downwind range within which contamination will generally not exceed the Federal PAGs is limited to about 50 miles from an NPP because of wind shifts during the release and travel periods.
- There may be conversion of atmospheric iodine to chemical forms which do not readily enter the ingestion pathway.
- Much of any 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.

If an ORO wants to change the boundary of an existing EPZ, the proposal must be submitted to the FEMA Regional Administrator or designee, which is typically the RAC Chair. The proposal should include, but is not 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 ETEs.
- 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 ETEs. The information should include changes to the geographical boundary descriptions and the ANS, including additional sirens or other means for public notification. Any modifications to any ANS must be consistent with Part V of the RPM.

C. CREDENTIALING FRAMEWORK

Credentialing is the administrative process for validating personnel qualifications and providing authorization to perform specific functions. 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 Credentialing 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 possess the qualifications necessary to serve 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 (1) training, (2) practicum, which is a practical application of skills involving evaluator on-the-job training (OJT) and plan reviewer mentorship, and (3) 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 the evaluator or plan reviewer track.

D. REP EXERCISE PROCESS MILESTONES AND FREQUENCIES

1. REP Exercise Process Milestones

Exhibit IV-1, Milestones for the REP Exercise Process, provides a timeframe for completing exercise development, conduct, evaluation, and reporting activities. The milestones surrounded by asterisks are relatively inflexible, representing deadlines imposed by regulations or those that could significantly impact the exercise if missed. Although other listed milestones fall short of being requirements, they are highly recommended by FEMA.

Exhibit IV-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., FRMAC, A-Team, etc.), if desired for the exercise	State, FEMA
365	Establish or confirm exercise date ⁴⁰	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	Prepare 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 ⁴¹	State, Utility
90	Conduct Midterm Planning Meeting (MPM) and review the following draft documents: Master Scenario Events List (MSEL), Exercise Plan (ExPlan), Controller/Evaluator (C/E) Handbook, EEGs, and the extent-of-play agreement.	State, Utility, FEMA
90	Submit approved plans/procedures to FEMA Region	OROs
75	Complete review of draft ExPlan and EEGs and approve	FEMA
60	Submit draft exercise scenario and MSEL 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	Complete Scenario Review and approve	FEMA
30	Finalize MSEL	State
30	Conduct Final Planning Meeting (FPM)	State, Utility, FEMA

⁴⁰ For changes to an exercise date due to extenuating circumstances, notice is given to the FEMA Region as soon as possible.

⁴¹ 120 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
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
ED	Conduct player Hot Wash	OROs
ED +1	Initiate consultation process for Level 1 Findings	RAC Chair
ED +2	Notify FEMA Headquarters of potential Level 1 Finding	FEMA
ED +2	Complete exercise evaluation documentation	FEMA
ED +2	Conduct evaluator debrief	FEMA
ED +3	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	Notify State of Level 1 Findings	FEMA
ED +20	Acknowledge receipt of Level 1 Findings letter and propose schedule for remedial actions	State
ED +30	Send draft AAR/IP to State(s) for review	FEMA
ED +60	Send draft AAR/IP comments to FEMA Region	State
ED +75	Conduct After-Action Meeting (AAM)	State, FEMA
ED +90	Issue final AAR/IP	FEMA
ED +90	Share lessons learned, best practices, and demonstrated strengths identified in final AAR/IP	State, FEMA
ED +120	Evaluate and report on remedial exercises and/or corrective action(s) taken to correct identified Level 1 Findings	FEMA
Ongoing	Track evaluation of Objectives/Capability Targets	State, FEMA

2. REP Exercise Process Frequencies

Exhibit IV-2, REP Exercise Process Frequencies, provides a reference for the various activities that need to occur within an 8-year exercise cycle

Exhibit IV-2: REP Exercise Process Frequencies

Exercise Types	Reference	Frequency
Plume Exposure Pathway	44 CFR §§ 350.9(c) (1), (2), and (3) N.2.a	Biennially (i.e., four times in an 8-year exercise cycle)
Ingestion Exposure Pathway and Relocation, Reentry, and Return (RRR)	44 CFR 350.9(c) (4) ⁴² N.2.b	At least once every 8 years (i.e., once in an 8-year exercise cycle) FEMA recommends demonstrating ingestion exposure pathway, relocation, reentry, and return activities within the same exercise when possible because of the similar scenario needs of exercise play

Exercise Scenario Elements	Reference	Frequency
HAB	N.3.a	Each 8-year exercise cycle (i.e., once in an 8-year exercise cycle) Can be combined with other scenario elements, though cannot be combined with No/Minimal Release of Radioactive Materials scenario element in consecutive 8-year exercise cycles
Rapid Escalation	N.3.b	Each 8-year exercise cycle (i.e., once in an 8-year exercise cycle) Can be combined with other scenario elements
No/Minimal Release of Radioactive Materials	N.3.c	Use is recommended but not required If used should only be once in an 8-year exercise cycle Can be combined with other scenario elements, though cannot be combined with HAB scenario element in consecutive 8-year exercise cycles
Resource Integration	N.3.d	Each 8-year exercise cycle (i.e., once in an 8-year exercise cycle) Can be combined with other scenario elements

⁴² FEMA is in the process of updating this regulation to match the change in exercise requirements for the licensees made by the NRC (10 CFR 50, Appendix E) which addresses the change from exercising the plans and preparedness related to the ingestion exposure pathway measures at least once every five years to at least once every eight years.

Exhibit IV-3: REP Drill Frequencies

Drills	Reference	Frequency
Medical Services	N.4.b	Annually Evaluated by FEMA biennially Can be conducted in conjunction with biennial exercise
Laboratory	N.4.c	Biennially at each laboratory designed in the emergency plan Each laboratory is only evaluated once every 8-year exercise cycle
Environmental Monitoring	N.4.d	Annually Can be conducted in conjunction with biennial exercise
Ingestion Pathway and Post-Plume Phase	N.4.e	Biennially Can be conducted in conjunction with biennial exercise All organizations with roles/responsibilities will participate in at least one drill during each 8-year exercise cycle
Communications	N.4.f	Monthly between organizations with roles/responsibilities within the plume exposure pathway EPZ Quarterly between organizations with roles/responsibilities within the ingestion exposure pathway EPZ

E. 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; the packets must include the following materials:

- Resume describing tangible REP-related experience and/or equivalent experience;
- Evidence of completion of the FEMA credentialing program;
- Two letters of reference addressing the evaluator's ability to be impartial, suitability, and qualifications (applicants must be high school graduates, or equivalent [college is preferred]); and
- Letter of 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 Region's 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 plume and/or ingestion exposure pathway EPZ for their site. The accepting RAC Chair is responsible for communications with the assigned evaluator and will send a selection/non-selection letter to each applicant.

National Registry: FEMA Headquarters maintains a national registry of available qualified ORO evaluators.

2. Host Responsibilities

The FEMA Host Region will:

- Request evaluator(s) for upcoming exercise(s);
- 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 materials;
- Participate in all required exercise meetings;
- Prepare all written exercise evaluator documentation; and
- Ensure time flexibility in participating as an evaluator, which may require weekend duty.

4. Evaluator Employer Commitment

The evaluator's employer will facilitate/support employee attendance at all required evaluator trainings, meetings, etc., and agree, in writing, to the conditions stated in Step 5.

5. Conditions

ORO REP exercise evaluators are not eligible to receive any compensation, including workers' compensation or other types of payment; 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.

F. TRIBAL POLICIES AND PROCEDURES

1. Policy

The following are the current policies regarding FEMA's relationship with tribal governments: Executive Order 13175 of November 6, 2000, *Consultation and Coordination with Indian Tribal Governments* (65 Fed. Reg. 67249, Nov. 9, 2000); Presidential Memorandum on Tribal Consultation of November 5, 2009 (74 Fed. Reg. 57881, Nov. 9, 2009); FEMA Tribal Policy (December 27, 2016); and FEMA Tribal Consultation Policy (July 3, 2019).

2. Procedures

For a tribal government participating in the REP Program, it is recommended that it enter into consultation with both FEMA and the NRC. In such situations where the tribal government determines it would act as an independent entity, it would be appropriate to achieve the evaluation criteria marked as applicable for tribal governments. This document does not obligate the tribal governments to use the evaluation criteria to build its emergency plans; however, the tribal governments are highly encouraged to consider the evaluation criteria. Tribal government agreements with state and local governments will dictate the degree to which evaluation criteria will apply.

FEMA's National Tribal Affairs Advisor and the Office of External Affairs, Congressional and Intergovernmental Affairs Division, Tribal Partners Branch, and the Regional Tribal Liaisons in all ten FEMA Regions promote tribal engagement across the agency and work with FEMA program offices to ensure FEMA programs, policies, and actions consider the sovereignty and unique needs of all the federally recognized tribal governments. As the first resource and point of contact for tribes, the Regional Tribal Liaisons are a critical piece of FEMA outreach and collaboration with all tribal governments and help ensure FEMA considers the unique needs and capabilities of tribal communities. The National Tribal Affairs Advisor at FEMA is the lead advisor to the FEMA Administrator for tribal affairs at FEMA Headquarters. Additional information can be found on FEMA's Tribal Affairs website (www.fema.gov/fema-tribal-affairs).

G. STAFF ASSISTANCE VISITS

The purpose of a SAV is to provide assistance to OROs. The SAV may also be used to support demonstration/evaluation of certain objectives/capability targets as shown in Exhibit III-1, *REP Assessment Process Matrix*.

A SAV is coordinated with the affected OROs. The visits may be initiated by the FEMA Regional Office or requested by the OROs.

The purpose of the SAV may include, but is not limited to:

- Providing technical assistance to the 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 to receive credit for responses to real-world incidents.
- 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 is current for both emergency workers and, if it is 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.

H. EVACUATION TIME ESTIMATES

ETEs are required within the plume exposure pathway EPZ under planning standard J: Protective Response. Please note that ETEs are not required for the ingestion exposure pathway EPZ.

NUREG-0654/FEMA-REP-1, Rev. 2 necessitates that the licensee to prepare the ETEs and the state to include the information in its plans/procedures, however FEMA is not responsible for reviewing and approving ETEs. Instead, FEMA reviews ORO plans/procedures to see whether they include the latest ETE information from the licensee. While lower ETEs may reflect favorable site characteristics from an emergency planning standpoint, there is no minimum required evacuation time in the regulations that a licensee or an applicant has to meet.

NRC provides guidance to licensees in the document NUREG/CR-7002, *Criteria for Development of Evacuation Time Estimate Studies*. ETEs need to be updated following each decennial census. In addition, an ETE update must be performed if, at any time during the 10-year period, the plume exposure pathway 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 plume exposure pathway EPZ to change by 25 percent or 30 minutes, whichever is less, from the licensee's currently approved ETE.

I. POTASSIUM IODIDE FOR THE PUBLIC

Federal Register, Vol. 66, No. 13, pp. 5427-5440, *Consideration of Potassium Iodide in Emergency Plans; Final Rule*, Nuclear Regulatory Commission, January 19, 2001.

Federal Register, Vol. 66, No. 238, pp.64046-64047, *Guidance on Use of Potassium Iodide as a Thyroid Blocking Agent in Radiation Emergencies; Availability*, Food and Drug Administration, December 11, 2001.

Federal Register, Vol. 67, No. 7, pp. 1335-1357, *Federal Policy on Use of Potassium Iodide (KI)*, Federal Emergency Management Agency, January 10, 2002.

Federal Register, Vol. 69, No. 45, pp.10725-10725, *Guidance for Federal Agencies and State and Local Governments: Potassium Iodide Tablets Shelf Life Extension; Availability*, Food and Drug Administration, March 8, 2004.

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/tribal KI stockpiles. States 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 NPPs. The Federal position is that KI should be stockpiled and distributed to emergency workers and institutionalized persons for radiological emergencies at an NPP and its use should be considered for the general public within the 10-mile EPZ of an NPP. However, the decision on whether to use KI for the general public is left to the discretion of states and, in some cases, local and/or tribal governments.

KI Shelf Life: FEMA adopts 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, U.S. NRC, Washington, DC 20555.

J. 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 CPG 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 local 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, REP plans/procedures 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 planning standards, associated NUREG-0654/FEMA-REP-1, Rev. 2 evaluation criteria, 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 SOGs, 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 Evaluation Criteria

The NUREG-0654/FEMA-REP-1, Rev. 2 contains the 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, Rev. 2 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, Rev. 2 may be primarily (or solely) the responsibility of the state, local, and/or tribal government(s).

When evaluating a REP plan, the evaluator 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 any corresponding plans/procedures to fully understand the breakdown of responsibilities between the state, local, and tribal governments. 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-4.

Exhibit IV-4: Plan Reviews

Plan Review Activity	Responsible Agency
Application for formal FEMA 44 CFR Part 350 approval	FEMA
Combined License Applications	FEMA
ESP Applications	FEMA
Prior to submittal of the ALC to FEMA. An ALC is necessary 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, Rev. 2 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, Rev. 2. 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, Rev. 2 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.

K. 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-5: Scenario Review Process

STEP 1	<p>Conduct an inventory and very rudimentary review of the REP Exercise Scenario package provided. Use the <i>REP Exercise Scenario Review Checklist</i> to ensure that all documentation necessary to perform the scenario review is present.</p> <p>(2 hours)</p>
STEP 2	<p>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 objective(s) and capability target(s) by the offsite jurisdictions for a plume and/or ingestion exposure pathway exercise. This step will include:</p> <ul style="list-style-type: none"> ■ Review the scope of the scenario to ensure that: <ul style="list-style-type: none"> • All impacted jurisdictions are included; • Map(s) of the plume and/or ingestion exposure pathway EPZ is included. • Expected offsite actions are consistent with the extent-of-play agreements. ■ Review the proposed accident scenario to determine: <ul style="list-style-type: none"> • Type of threat (potential plant conditions vs. simulated radiological release). • Radiological release characteristics (radionuclide mixture). <ul style="list-style-type: none"> ▫ For plume exposure pathway exercise play: to allow offsite field monitoring teams to collect and field count representative air samples, the plume must contain at least 10^{-7} $\mu\text{Ci/cc}$ radioactive iodine or the release must exceed TED PAG for evacuation out to 3 miles downwind. ▫ For relocation, reentry, and return exercise play: the source term must contain one or more long-lived radionuclides such as cesium. Soil sample radionuclide mix ratios must be consistent enough to allow offsite dose assessors to calculate an incident specific DRL. ▫ For ingestion pathway exercise play: the source term must contain iodine and some long-lived radionuclide (e.g., cesium or strontium). • Degree of risk to the public (EPA PAGs or state equivalent to be exceeded and to what degree). <ul style="list-style-type: none"> ▫ For plume exposure pathway exercise play: the release must produce doses that exceed EPA PAGs at least 3 miles from the NPP in order to sufficiently drive plume pathway exercise activities. Since the 5 rem child thyroid dose is a supplementary PAG, it is preferred that a 1 rem TED dose over four days be exceeded. ▫ For relocation, reentry, and return exercise play: the EPA relocation PAG of 2 rem annual dose (first year) must be exceeded, preferably at least 7 miles from the NPP. ▫ For ingestion pathway exercise play: the FDA PAGs for some foodstuffs must be exceeded well past the plume exposure pathway EPZ, preferably out to at least 25 miles from the NPP. • Meteorological conditions (including wind and weather). • Technical adequacy of the scenario's offsite data to support technical controller injects. <p style="text-align: right;"><i>Step 2 continued on next page</i></p>

STEP 2 (Cont.)	<ul style="list-style-type: none"> ■ Review of the controller injects' content (technical) to determine: <ul style="list-style-type: none"> • 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.). <ul style="list-style-type: none"> ▫ For relocation, reentry, and return exercise play: an area that was evacuated during the early phase should fall outside the intermediate phase relocation area and at least one location that was not evacuated during the early phase should fall within the intermediate phase relocation area. ▫ For ingestion pathway exercise play: food samples analyzed during the intermediate phase should have a mix of samples that exceed FDA DILs and some that do not. <p>(10 hours for plume exposure pathway exercise) (16 hours for ingestion exposure pathway and/or relocation, reentry, return exercise)</p>
STEP 3	<p>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 objective(s) and capability target(s) in the jurisdictions to be exercised. Verify the area affected by the plume or deposition footprint.</p> <p>(2 hours for plume exposure pathway exercise) (2 hours for ingestion exposure pathway and/or relocation, reentry, return exercise)</p>
STEP 4	<p>Analyze the time sequences and intervals between planned exercise events. Ensure that adequate time has been allowed for the appropriate OROs to demonstrate the selected objective(s) and capability target(s) (technically) sufficiently.</p> <p>(2 hours)</p>
STEP 5	<p>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.</p> <p>(4 hours – more may be needed if more than one FEMA Region is involved)</p>
STEP 6	<p>Assist and support the FEMA Region(s) RAC Chair in negotiating scenario changes with the state(s) and/or licensee, as requested.</p> <p>(4 hours)</p>
STEP 7	<p>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 REP Program Branch, FEMA Headquarters. Retain a detailed record of the scenario review with the contractor's files.</p> <p>(6 hours)</p>

2. Radiological Emergency Preparedness Exercise Scenario Review Checklist

The following information is provided to the scenario reviewer to facilitate the conduct of a comprehensive technical review of the submitted REP exercise scenario. The data listed below is not intended to include all of the data that is needed for the scenario. The FEMA Region(s) RAC Chair makes appropriate arrangements assuring that the information is provided to the contractor.

FACILITY: _____

CHECK IF INCLUDED

I. PRE-EXERCISE AGREEMENTS AND EXERCISE BACKGROUND MATERIALS

- _____ 1.* Objective(s) and capability target(s) to be demonstrated by designated state, local, and tribal jurisdictions.
- _____ 2.* Pre-exercise agreements, including extent-of-play agreements by objective(s) and capability target(s).
- _____ 3.* Previous AAR 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 tribal government, and appropriate agency plans/procedures, including detailed and readable maps showing pre-selected reference points.
- _____ 5.* NUREG-0654/FEMA-REP-1, Rev. 2 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 reviewer.

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/capability targets (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 exposure rates or atmospheric dilution factors (X/Q) plotted on a map, including date and times of data values, usable by field team controllers.
- _____ 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 fractions 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

Agency/Organization

Date

L. ANNUAL LETTER OF CERTIFICATION

1. Guidance

To facilitate monitoring of REP Program planning and preparedness, 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 due 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 ALC checklist 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. The ALC must include assurances that all requisite activities have been undertaken or completed, as appropriate, by OROs.

M. PUBLIC INFORMATION REVIEW GUIDE AND PROCESS

1. Guidance

a. Purpose

To provide guidance for review and evaluation of public information materials distributed by OROs and licensees.

b. Scope

Public information materials are reviewed both during the ALC process and prior to distribution to determine whether information and emergency instructions have been included and disseminated pursuant to laws and regulations, FEMA Headquarters and Regional policy determinations, the RPM, 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 should be updated and distributed annually. If the updates affect ingestion exposure pathway public information material, then that material must also be updated and reviewed by FEMA.

c. Basis

The basis of the public information review guide and process is found at 44 CFR 350 and NUREG-0654/FEMA-REP-1, Rev. 2 evaluation criteria.

2. 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 1965⁴³ 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, go to http://www.justice.gov/crt/about/vot/sec_203/203_brochure.php.

⁴³ Pub. L. No. 89-110 (1965) (codified as amended at 42 U.S.C. § 1973 et seq.).

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 (or 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 plume and/or ingestion exposure pathway 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 information, visit the U.S. Census Bureau at <https://www.census.gov/quickfacts>.

N. PRELIMINARY CAPABILITIES ASSESSMENT AND DISASTER-INITIATED REVIEW

When a natural or man-made disaster has occurred at, or near, an NPP and has no or minimal effect on the plant, but damage or changes to the offsite emergency response infrastructure may be substantial or are in question, FEMA may elect to perform a PCA or DIR to assess the impact.

FEMA uses a PCA to obtain a prompt assessment (snapshot) of offsite emergency preparedness immediately following an incident to assist the FEMA Region/FEMA REP Program's joint determination on the need and timing for a DIR. As addressed in the FEMA/NRC MOU, the purpose of the DIR is to formally determine the offsite emergency response infrastructure and capabilities to effectively implement approved emergency plans. Should FEMA's review indicate that offsite emergency response infrastructure and capabilities do not provide reasonable assurance that adequate protective measures can and will be taken in a radiological incident, and the NPP continues to operate, then such a finding would be handled by the NRC under 10 CFR § 50.54(s)(2) and (3).

The interim standard operating guide (SOG) "Assessment of Offsite Emergency Preparedness Infrastructure and Capabilities Following an Incident in the Vicinity of a U.S. Nuclear Regulatory Commission-Licensed Nuclear Power Plant" (available for download from the FEMA Library) contains guidelines and procedures for the FEMA REP Program to conduct and document a FEMA-led PCA and DIR. This SOG should be implemented consistent with the agreements in the MOU between FEMA and the NRC, "Regarding Radiological Response, Planning and Preparedness" dated December 7, 2015.

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Part V: REP Program Alert and Notification System Guidance

A. BACKGROUND

No NPP may operate in the United States without a license from the NRC. Before the NRC will grant a license it must determine that, among other things, the plant's emergency plan provides for adequate measures to ensure public health and safety.⁴⁴ ANSs are one of the factors the NRC considers when making this determination.⁴⁵

Although the NRC requires an effective ANS as one of the conditions for licensing, the NRC does not determine the adequacy of ANS licensing conditions independently.⁴⁶ Since 1980, both the U.S. Congress and the President have required the NRC to work with FEMA to assess the adequacy of radiological emergency response plans—which includes ANS—as a condition of obtaining or maintaining a license.⁴⁷ Both the NRC and FEMA address how this planning and preparedness assessment occurs in their respective regulations and guidance.⁴⁸

FEMA's mission is helping people before, during, and after disasters. While FEMA has responsibilities within all phases of emergency management, many of FEMA's REP Program activities fall under the preparedness umbrella.⁴⁹ The REP Program assesses offsite emergency preparedness for jurisdictions surrounding commercial NPPs in the United States.

FEMA and the NRC use the guidance in the joint NUREG-0654/FEMA-REP-1, Rev. 2, *Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants*, to review, evaluate, and approve radiological emergency plans. Three planning standards apply to ANS: notification methods and procedures (planning standard E); emergency communications (planning standard F); and exercises and drills (planning standard N).⁵⁰

The alerting and notification of the public is a function of the state, local, tribal, and territorial governments' emergency plans. An 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 ANS capability. An applicant/licensee may install and maintain the ANS but the responsibility for the alerting and notifying the public, as well as the activation of the ANS, remains with the state, local, tribal, and territorial governments. ANS design and implementation should include licensees, OROs, and any other relevant stakeholders to ensure collaborative consideration of the unique geographic, demographic, and technological factors of the stakeholder communities.

FEMA evaluators should use the RPM and NUREG-0654/FEMA-REP-1, Rev. 2 in their review of the ANS. The guidance included in this Part addresses key ANS evaluation concepts, provides an explanation of the types of information that should be included in the ANS evaluation report, which is made up of the ANS plan and design report.⁵¹

⁴⁴ 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").

⁴⁵ See, e.g., 10 CFR § 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).

⁴⁶ 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).

⁴⁷ See Nuclear Regulatory Commission Authorization Act of 1980, Pub. L. No. 96-295, § 109 (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 CFR 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).

⁴⁸ See generally 10 CFR Part 50 (presenting NRC regulations); 44 CFR 350 (presenting FEMA regulations).

⁴⁹ 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).

⁵⁰ For the full text of these planning standards, see 44 CFR §§ 350.5(5), (6), and (14).

⁵¹ For FEMA, the ANS evaluation report generally encompasses the content contained in the design report and the ANS/communications plan. See RPM Part V.2 FEMA Roles and Responsibilities for further explanation.

B. FEMA EVALUATION OF ANS

Alert and notification represents just a portion of the overall planning and preparedness that FEMA reviews when making its determination of reasonable assurance. Approval of the ANS is contained within FEMA's approval of the state, local, territorial, or tribal government(s) plans and preparedness in accordance with Title 44 of the CFR 350.5-350.7.

As part of this evaluation of ANS, when requested, FEMA staff and leadership collaborate directly with OROs, applicants, and/or licensees. This guidance for evaluating ANS allows evaluators to account for new technologies. FEMA does not require any specific ANS system, nor will it endorse any system. Upon request and with permission from the system owner, FEMA may share examples of approved ANSs currently being utilized. However, jurisdictions should be aware that an ANS that works for one community may not necessarily work in another community, given relevant factors such as population, geography, etc. OROs may submit any system for approval, provided that it meets the minimum acceptable design objectives. Other ANSs can be used in addition to the approved ANS; however, the approved ANS is the system of record and no change to, or substitution of, can be made without an update of the ANS evaluation report (ANS plan and design report) for submittal and subsequent approval.

1. Evaluation Concepts

An 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's evaluation considers the entire system of alerting and notification, but at times the guidance may address the individual components by using the terms "alert" or "notification" independently.

The minimum acceptable design objectives for coverage by and capability of ANS are as follows:

1. The capability to provide both an alert signal and an informational or instructional message to the population throughout the plume exposure pathway EPZ within 15 minutes. The basis for any special requirements/exceptions (e.g., for large water areas with transient boats or remote hiking trails) must be documented.
2. The initial notification system will ensure coverage of essentially 100% of the population within 5 miles of the site.
3. Notification methods will be established to ensure coverage within 45 minutes of essentially 100% of the population within the entire plume exposure pathway EPZ who may not have received the initial notification. The basis for any special requirement exceptions (e.g., 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 plan must include a provision for corrective measures to provide reasonable assurance that coverage in accordance with the design objectives is maintained. The system should be operable prior to initial operation greater than 5 percent of rated thermal power of the first reactor at a site.
4. The capability of the ANS to cover essentially 100% of the population within the entire plume exposure pathway EPZ, regardless of failures. There must be administrative and physical means to correct any ANS failure for any segment of the population that did not receive the alert and/or notification. The means and methods to correct or compensate for failures are identified and developed in conjunction with state, local, territorial, or tribal government officials and the utility operators. The corrective means/measures will be conducted within a reasonable amount of time, with a recommended goal of 45 minutes. All failure modes, including total failure, are accounted for and means/measures to overcome them must be documented. Historically most licensees and governmental jurisdictions use the sequential failure model also known as a "primary and backup" ANS model; use of this model is acceptable, though REP jurisdictions can use other models such as simultaneous or concurrent activation models, which differ from a redundant (exact duplicate) model.

FEMA makes its assessment based on the capabilities of the ANS and not just on the technical specifications. This method of evaluation avoids prescribing a “one-size-fits-all” approach by studying all the available data and verifying that the solution the jurisdiction settled upon can and will function as designed. Additionally, this type of assessment prevents unintentional bias for any single type of system. Further, it eliminates uncertainty for the ANS designers; if the design meets the minimally acceptable design objectives and the plans satisfy the NUREG-0654/FEMA-REP-1, Rev. 2 evaluation criteria, FEMA will recommend a finding of reasonable assurance as it relates to ANS.

FEMA and the NRC acknowledge that not every radiological emergency at an NPP will affect the community living within the plume exposure pathway EPZ within 15 minutes. However, the ANS must be designed according to worst-case scenario. Moreover, even if the incident does not escalate rapidly, the initial notification should occur without undue delay in order to ensure wide-spread public health and safety.

2. FEMA’s Roles and Responsibilities

When a new ANS or a change to a previously approved ANS 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. FEMA offers both planning and technical (i.e., scientific, engineering) guidance. The state, local, territorial, or tribal government should submit the ANS plan⁵² and the design report together as the ANS evaluation report, through the state, to the RA. With the assistance of the RAC Chair and using FEMA guidance, the RA determines if the ANS evaluation report represents a significant change.⁵³ FEMA Regional staff will notify FEMA Headquarters and the NRC of the receipt of these documents.

The RAC Chair and designated staff will review the ANS evaluation report against the planning standards and/or associated NUREG-0654/FEMA-REP-1, Rev. 2 evaluation criteria. During this review, the Region may provide guidance and seek clarification or corrections and may directly contact the responsible ORO or licensee. Upon completion of the review, the RAC Chair will submit recommendations in the ANS evaluation report to FEMA Headquarters. The RAC Chair will notify the state, local, territorial, or tribal government(s) on the status of the ANS evaluation report (with a special emphasis on the design report and the current engineering standards), including receipt, completion of review, and submission to FEMA Headquarters.

At FEMA Headquarters, the THD engineering staff will review the ANS evaluation report against current engineering standards, the planning standards, and associated NUREG-0654/FEMA-REP-1, Rev. 2 evaluation criteria. During this review, the THD engineering staff may work in coordination with FEMA Regional staff to provide guidance, seek clarification, and/or otherwise engage in discussions with the responsible ORO or licensee (in coordination with NRC). Upon completion of this review, recommendations on the ANS evaluation report will be submitted to the FEMA THD Director. FEMA Headquarters staff will notify the relevant RAC Chair and the NRC of the status of the ANS evaluation report, including receipt, completion of review, and submission to the THD Director. The RAC Chair will then notify the relevant state, local, territorial, or tribal government(s).

Prior to submitting to the appropriate FEMA approval authority,⁵⁴ the THD Director will review the ANS evaluation report and provide recommendations, if needed. Once approved, FEMA Headquarters will provide the ANS evaluation report to the NRC for their records and notify the associated RAC Chair. The RAC Chair will notify the status of the submission to the relevant state, local, territorial, or tribal government(s) and other stakeholders, depending on jurisdictional requirements and processes.

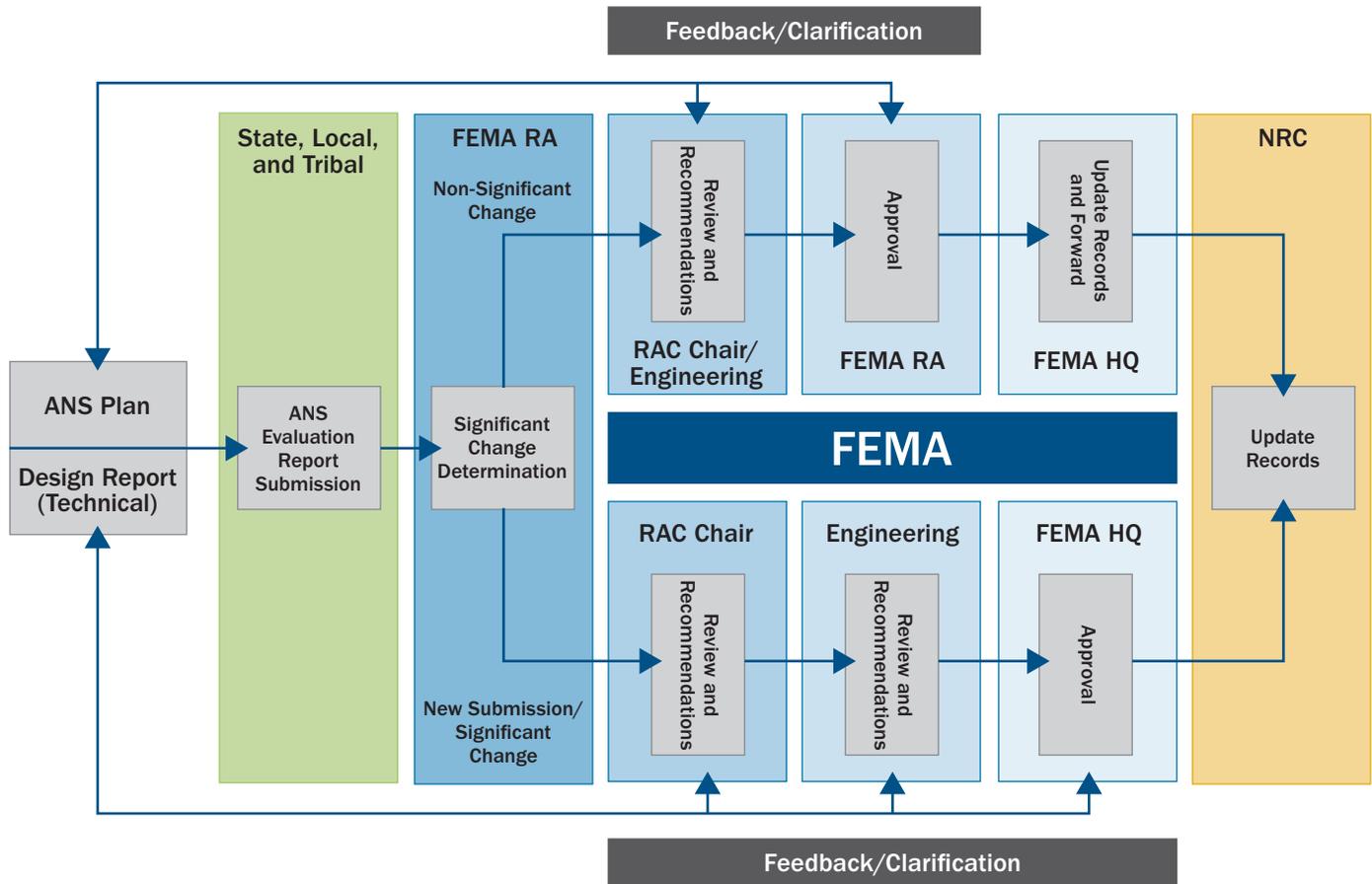
⁵² ANS plan, where the administrative means and emergency planning aspects of the system(s) are addressed.

⁵³ 44 CFR 350.14 Amendments to state plans, such as significant changes, are approved by the Deputy Administrator of Resilience. The state plan includes the ANS Plan and Design Report as described in Part V of the RPM.

⁵⁴ 44 CFR 350.12-14 FEMA Headquarters Review and Approval, Deputy Administrator of Resilience or their designee.

3. Evaluation Process Flow

The graphic below depicts the review and the approval process for submitted ANS evaluation reports.



4. Licensee and ORO Roles and Responsibilities

OROs and licensees will compile and submit the ANS evaluation report through the state, local, territorial, or tribal government(s) to the appropriate RA. FEMA will work jointly with OROs and industry representatives, as applicable, to compile the ANS evaluation report which includes the technical aspects of the design report and the planning aspects of the ANS plan. FEMA will evaluate the planning aspects under the appropriate planning standards and associated NUREG-0654/FEMA-REP-1, Rev. 2 evaluation criteria.

FEMA anticipates the ANS evaluation report be submitted in a standardized format, using the guidance referenced in the next section. This standardization ensures FEMA is able to make an efficient and effective determination.

C. ANS EVALUATION REPORT GUIDANCE

The information below should be used as a guide when preparing the ANS evaluation report for a jurisdictional ANS. This report format/template is flexible enough to account for new systems and/or unconventional approaches. A template of the ANS evaluation report can be found within the [REP Policy and Doctrine Community](#) within the PrepToolkit.

Please note that not all headings or sections will be applicable in all cases.

1. Introduction of the ANS Evaluation Report

Title Page

The Title Page contains basic information about the report such as the name and date of the report, name of the NPP, and applicable revision number.

Signature Page

The Signature Page has signatures of responsible officials attesting to the accuracy, completeness, and concurrence of information included within the ANS evaluation report. Since alert and notification is a key component of offsite planning and is part of the state, local, territorial, or tribal government(s) radiological emergency plan approval under 44 CFR 350, the responsible official from the state, at a minimum, must sign. No ANS design, plan, or revision may be considered by FEMA without the state's concurrence.

Other signatories could include responsible officials or representatives from the utility emergency preparedness, the local or county emergency management agency, the state, local, territorial, or tribal government(s) emergency management, and the FEMA Region.

Revision History

The Revision History is a summary of the current version, as well as a history of past revisions. This is typically shown as a table with each revision number and an associated summary outlining the change in each version.

Table of Contents

The Table of Contents outlines all sections of the report; any additional information should be included as annexes or appendices.

Executive Summary

The Executive Summary provides a short overview that describes the overall physical and administrative features and functions of the ANS. If the ANS evaluation report is an update to a previous version, it should also include a summary of the changes from the previous version.

2. Body of the ANS Evaluation Report

Below are points of review that should be addressed in the body of the ANS evaluation report for *each type of system used*. The ANS evaluation report is divided into two main sections: the ANS plan, where the administrative means and emergency planning aspects of the system is addressed; and the design report, where the physical means and technical components of the system are detailed. Depending on the type of system, some headings may be more relevant or need more information than others.

ANS Plan

This section is comprised of the information that is provided to satisfy planning standards E and F, the associated NUREG-0654/FEMA-REP-1, Rev. 2 evaluation criteria, and focuses on the administrative means of the system(s). A copy of the ANS plan, or, if no formal ANS plan exists, a collection of the information, should be included as part of the ANS evaluation report. A description of the following for the system should be addressed in this section:

- Any obligations between the licensee and the state, locals, tribes, or territories;
- Operation;
- Responsibility/authority;
- Administration;
- Requirements/functions;
- Security and privacy;
- Training and quality assurance;
- Public outreach and education;
- Messaging to include the considerations/accommodations for the needs of specific populations; and
- Maintenance.

Depending on the design and the relationship between the NPP and the ORO, the above descriptions and documentation may be duplicative. The duties and obligations of the operations and functions may be shared in part or whole by either party and cannot be accurately reviewed without studying the entire ANS evaluation report.

Design Report

- **Licensing obligations** (if any) – NRC licensing agreements address having a functional ANS and can include specific requirements unique to a particular licensee and/or state, local, territory, and/or tribal government organization. Any obligations or concessions contained within the licensing agreement should be included here.
- **Requirements**
 - **System coverage**
 - **Population** – Description or characterization of the population required to be alerted across a geographical area.
 - **Geographic Area** – Description of the geographic area intended for each systems' coverage.
 - **Means** – Description of the type of system to be used.
 - **Primary Methods** – Description of the methods to be used to alert and notify the population in the geographic area, both described above.
 - **Backup Methods** – Description of the methods to correct or compensate for failures (including total failure) for any segment of the population that did not receive the alert and/or notification.
 - **Population/Demographics** – Description of population groups (e.g., transient populations, those with access/functional needs, non-English speakers, etc.), including any special requirements.
 - **Interoperability** – Description of how the system interfaces with other systems and how that interface is accomplished, if applicable.
 - **Operations** – Description of all operational requirements.
 - **Management/Administration** – Identify and describe the organizations and/or individuals responsible for management and oversight of the system, or the administration of third party agreements with vendors.

- **Security and Privacy**
 - **Physical Security** – Description of physical security requirements, such as prevention of unauthorized access to systems and the components necessary to operate it.
 - **Logical Security** – Description of logical security (cyber-security) requirements, such as prevention of unauthorized or malicious access to the system, or accidental or malicious actions resulting in denial of service and other cyber-security.
 - **Maintenance/Repair**
 - **Preventative maintenance** – Identify and describe routine and periodic maintenance requirements.
 - **Corrective maintenance** – Identify and describe procedures and resources for correcting areas requiring improvement.
 - **Availability/Reliability** – Identify and describe reliability and availability requirements. The NRC requires greater than 94 percent availability, or the elimination of all critical single-point failure modes. These requirements may include system operation in all weather conditions typical for the local climate.
 - **Testing** – Identify and describe how system performance, availability, and reliability is tested and verified on a periodic basis, including how often and 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. Identify how the results of periodic and as-needed testing are recorded, preserved, and made available for inspection.
 - **Responsibility** – Identify the individual(s) responsible for system maintenance, testing, and repair.
 - **Training** – Identify and describe 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**
- **Physical components**
 - **System components** – Description of the major parts of each system being employed.
 - **User interfaces** – The device, system, or physical equipment used to activate or control the ANS and its locations.
 - **Functional block diagrams** – A diagram used to describe each logical and physical connection of components and systems.
 - **Administrative components**
 - **Organizational responsibilities** – Description of established roles and responsibilities for operation, planning, maintenance, and testing of the ANS under discussion.
 - **Management** – Description of the controls used to ensure the proper use of ANS and implementation of any corrective actions.
 - **Operational Components**
 - **Activation** – Description of location(s), access, and processes for activating ANS.
 - **Timing** – Description of how long it takes to activate the system—after determining the need to activate ANS—and length of time between initiation of the system and when the alert and notification is received by the public.
 - **Geo-Targeting** – Description of the system limits in its ability to select a geographic location.

- **Verification** – Documents that the system or approach meets the design report requirements identified above. The need to verify applies to implementation of both new and modified systems and approaches. Information provided here should objectively demonstrate that the system or approach meets the stated requirements, which can be verified by tests, inspections, demonstrations, analyses, studies, or any other applicable method. Each of the requirements identified should have a description of the corresponding verification process.
 - **Coverage** – The coverage (extent or reach) of the ANS can be verified through modeling of the ANS medium (e.g., radio, tone alerts, visual alerts, etc.) using existing accepted sources and databases, empirical data through testing, or other recognized means of verification.
 - **Population/Demographics** – Population and demographic information may be verified by identifying credible sources used for the population data. Credible sources may include census data, city or county records, local/tribal organization records, etc.
 - **Metrics** – Identification of the method(s), standard(s), or precedent(s) used to determine success or failure to meet the design objectives.
- **Availability/Reliability** – Description of how failures are detected and tracked/trended, how the system is tested and maintained, and how vulnerabilities are identified, mitigated, and reported.
- **Security and Privacy** – Description of the supporting information and data.
- **Training and Public Outreach** – Description of the training required for applicable stakeholders of the ANS, including training for personnel who operate and maintain the ANS; also a description of the public education and outreach activities. An informed population is far more likely to understand and respond appropriately to notifications and take action in emergency situations.

3. FEMA Evaluation Form

This evaluation form is completed after the all sections are submitted by the state, local, territorial, or tribal government representative to the appropriate RAC Chair. The form can be found on PrepToolkit. The evaluation form tracks movement and maintains accountability of the submitted documents by requiring information and/or signatures from the appropriate RAC Chair, THD engineering representative, THD Director, and an NRC representative. These signatures indicate completion of each part and receipt of delivery.

4. Attachments

Additional information, such as maps, diagrams, and/or references, which support the efficient evaluation of an ANS, should be included here.

Appendix A: Abbreviations and Acronyms Used in the REP Program

A-Team	Advisory Team for Environment, Food, and Health	EAS	Emergency Alert System [formerly Emergency Broadcast System (EBS)]
AAM	After-Action Meeting	EBS	Emergency Broadcast System [replaced by the Emergency Alert System (EAS)]
AAR	After-Action Report	ECCS	emergency core cooling system
ACP	access control point	ECL	emergency classification level
AHJ	Authority Having Jurisdiction	ED	exercise day
ALARA	as low as reasonably achievable	EEG	Exercise Evaluation Guide
ALC	Annual Letter of Certification	EMS	emergency medical services
ANS	alert and notification system	EOC	emergency operations center (state, local, or tribal government)
ANSI	American National Standards Institute	EOF	emergency operations facility (licensee)
ARC	American Red Cross	EP	emergency preparedness
CDC	U.S. Centers for Disease Control and Prevention	EPA	U.S. Environmental Protection Agency
C&O	Concepts and Objectives (meeting)	EPZ	emergency planning zone
C/E	Controller and Evaluator	ERDS	Emergency Response Data System
cfm	cubic feet per minute	ERO	emergency response organization
CFR	Code of Federal Regulations	ESP	early site permit
Ci	curie	ETE	evacuation time estimate
CNS	central nervous system	ExPlan	Exercise Plan
COL	combined license	FBI	Federal Bureau of Investigation
CPG	Comprehensive Preparedness Guide	FCC	U.S. Federal Communications Commission
cpm	counts per minute	FDA	U.S. Food and Drug Administration
CRCPD	Conference of Radiation Control Program Directors	FEMA	Federal Emergency Management Agency
Cs	cesium	FIOP	Federal Interagency Operational Plan
DHS	U.S. Department of Homeland Security	FMT	field monitoring team
DIL	derived intervention level	FNSS	functional needs support services
DIR	disaster-initiated review	FPM	Final Planning Meeting
DOC	U.S. Department of Commerce	FRMAC	Federal Radiological Monitoring and Assessment Center
DOD	U.S. Department of Defense	FRPCC	Federal Radiological Preparedness Coordinating Committee
DOE	U.S. Department of Energy	FSAR	Final Safety Analysis Report
DOT	U.S. Department of Transportation	GE	General Emergency
DRD	direct-reading dosimeter		
DRL	derived response level		
EAL	emergency action level		

GIS	geographic information system	NIST	National Institute of Standards and Technology
GM	Guidance Memorandum	NNSA	National Nuclear Security Administration
G-M	Geiger-Mueller (detector)	NOAA	National Oceanic and Atmospheric Administration
GPS	global positioning system	NOUE	Notification of Unusual Event
Gy	gray	NPD	National Preparedness Directorate
HAB	hostile action-based	NPG	National Preparedness Goal
HAZMAT	hazardous materials	NPP	nuclear power plant
HEPA	high-efficiency particulate air (filters)	NPS	National Preparedness System
HHS	U.S. Department of Health and Human Services	NRC	U.S. Nuclear Regulatory Commission
HP	health physicist	NRF	National Response Framework
HPT	health physics technician	NRIA	Nuclear/Radiological Incident Annex
HSEEP	Homeland Security Exercise and Evaluation Program	NRT	National Response Team
HSPD	Homeland Security Presidential Directive	NVLAP	National Voluntary Laboratory Accreditation Program
I	iodine	NWS	National Weather Service
I&C	Instrumentation and Control	OCC	Office of the Chief Counsel (FEMA)
ICP	Incident Command Post	OJT	on-the-job training
ICS	Incident Command System	ORO	offsite response organization
IP	Improvement Plan	OSC	Operational Support Center
IPAWS	Integrated Public Alert and Warning System	OSHA	U.S. Occupational Safety and Health Administration
IPM	Initial Planning Meeting	OSLD	optically stimulated luminescence dosimeter
JIC	joint information center	PAD	protective action decision
JIS	joint information system	PAG	protective action guide
KI	potassium iodide	PAR	protective action recommendation
LOA	letter of agreement	PCA	Preliminary Capabilities Assessment
MDL	minimum detection limits	PII	personally identifiable information
MOU	memorandum of understanding	PIO	Public Information Officer
MPM	Midterm Planning Meeting	PKEMRA	Post-Katrina Emergency Management Reform Act
MSEL	Master Scenario Events List	PPD	Presidential Policy Directive
μ	micro	PPE	personal protective equipment
μCi	microcuries	PRD	permanent record dosimeter
μR	microRoentgen	Pu	plutonium
NAWAS	National Warning System	R	roentgen
NEI	Nuclear Energy Institute	R/h	roentgen per hour
NEP	National Exercise Program	RA	Regional Administrator
NGO	non-governmental organization		
NIMS	National Incident Management System		

RAC	Regional Assistance Committee	TAC	traffic and access control
RACES	Radio Amateur Civil Emergency Services	TCP	traffic control point
rad	radiation absorbed dose	TED	total effective dose
RAP	Radiological Assistance Program	TEP	Training and Exercise Plan
REA	radiation emergency area	TEPW	Training and Exercise Planning Workshop
rem	roentgen equivalent man/mammal	THD	Technological Hazards Division (FEMA)
REP	Radiological Emergency Preparedness	THIRA	Threat and Hazard Identification and Risk Assessment
RLO	Regional Liaison Officer	TLD	thermoluminescent dosimeter
RPM	REP Program Manual	TMI	Three Mile Island
RSO	Radiation Safety Officer	TSC	Technical Support Center
RTL	Regional Tribal Liaison	TTD/TTY	Telecommunication Device for the Deaf/TeleType
SAE	Site Area Emergency	TTX	tabletop exercise
SAV	staff assistance visit	UE	Unusual Event
SME	subject matter expert	USDA	U.S. Department of Agriculture
SOG	standard operating guideline	VOAD	Voluntary Organizations Active in Disaster
SPR	Stakeholder Preparedness Review	WEA	Wireless Emergency Alert (system)
Sr	strontium		
SRPC	Site Radiation Protection Coordinator		
Sv	sievert		

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Appendix B: Glossary of REP Terms

Absorbed dose: the amount of energy absorbed by an object or person per unit mass. Known as the ‘absorbed dose,’ this reflects the amount of energy that ionizing radiation sources deposit in materials through which they pass, and is measured in units of rad.

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 PAD 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: individual circumstances requiring assistance, accommodation, or modification for mobility, communication, transportation, safety, health maintenance, etc., due to any situation that limits an individual’s ability to take action in an emergency.

Accident assessment: the evaluation of the actual and potential consequences of a radiological incident.

Action levels: see trigger/action levels.

Activated: an EOC 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.

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 planning standards and associated NUREG-0654/FEMA-REP-1 evaluation criteria or alternative approaches approved by FEMA.

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 for Environment, Food, and Health (A-Team): includes representatives from the EPA, USDA, HHS (FDA), the CDC, and other Federal agencies as needed. The A-Team, supported by the FRPCC, develops coordinated advice and recommendations on environmental, food, health, and animal health matters for the Incident Command/Unified Command, the Joint Field Office, the Unified Coordination Group, the Federal agency with primary authority, and/or state and local governments, as appropriate. The A-Team uses information provided by the Interagency Modeling and Atmospheric Assessment Center, FRMAC, and other relevant sources. The A-Team makes protective action recommendations not decisions; provides coordinated technical and scientific advice through the state and Federal agency with primary authority; and bases its recommendations on science and best practices.

After-Action Meeting (AAM): a meeting held among elected and appointed officials or their designees from the exercising organizations, as well as the lead evaluator and members of the exercise planning team, to debrief the exercise and to review and refine the draft AAR/IP. The AAM should be an interactive session, providing attendees the opportunity to discuss and validate the analytical findings and corrective actions in the draft AAR/IP.

After-Action Report (AAR): summarizes key exercise-related evaluation information, including the exercise overview and analysis of objectives and core capabilities.

Agreement state: a state that has entered into an agreement under the Atomic Energy Act of 1954, as amended, in which the NRC 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.

Agribusiness: the group of industries dealing with agriculture produce and services required in farming.

Air sampler: a device used to collect a sample of radioactive particulates suspended in the air.

Alert: an ECL indicating that events are in progress or have occurred which involve an actual or potential substantial degradation of the level of safety of the plant or a security event that involves probable life-threatening risk to site personnel or damage to site equipment because of hostile action. Any releases are expected to be limited to small fractions of the EPA PAG exposure levels.

Alert and notification: the process of providing a warning signal to the public at risk, indicating the need to seek additional information regarding an emergency event in progress (alert), followed by informing the public about the nature of the event and any protective actions (notification).

Alert and notification system (ANS): the system used to alert and notify the public, including the physical means (equipment and methods) and administrative means (organizational responsibility and interaction of responsible organizations for alert and notification).

Alert system: the hardware system(s) used to get the attention of the public within the plume exposure pathway EPZ. An alert system may include a combination of sirens; IPAWS; tone activated radios; loud speakers/sirens on vehicles (including boats and airplanes); and other equipment/technology 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 +2. It has low-penetrating power and short range (a few centimeters in air). The most energetic alpha particle will generally fail to penetrate the skin, and can be easily stopped by a sheet of paper. Alpha particles are hazardous when an alpha-emitting isotope is introduced into the body.

Alpha radiation: comes from the ejection of alpha particles from the nuclei of some unstable atoms.

Alternative approach: provide an opportunity for state, local, and tribal governments, applicants, and licensees to meet the planning standards in a manner that is different from what the evaluation criteria recommend within this guidance document. While an alternate approach does not relax the requirements of the planning standards, it provides an opportunity to propose an alternative method for meeting the intent of the planning standards.

Alternative REP demonstrations: exercises and drills outside of the REP Program; FEMA will consider the demonstration and assessment of REP Program objectives/capability targets during these events.

Applicant: an entity that has applied for an NPP construction permit/operating license under 10 CFR Part 50 or 10 CFR Part 52.

Alternate EOC: an EOC outside the plume exposure pathway EPZ to which an emergency response organization may relocate if they must evacuate the “home emergency operations center” due to possible radioactive exposure.

American National Standards Institute (ANSI): a private, non-profit organization that administers and coordinates the U.S. voluntary standards and conformity assessment system.

American Red Cross (ARC): a humanitarian organization that provides emergency assistance, disaster relief, and disaster preparedness education in the United States.

Annual: every calendar year, except in cases relevant to 10 CFR 50.54(t) where “annual” means 365 days.

Annual letter of certification (ALC): used to facilitate monitoring of REP Program planning and preparedness; each state that has a REP Program annually 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.

ANS evaluation report: divided into two main sections: the ANS plan, where the administrative means and emergency planning aspects of the system is addressed; and the design report, where the physical means and technical components of the system are detailed.

ANS plan: the part of the ANS evaluation report where the administrative means and emergency planning aspects of the system are addressed.

As low as reasonably achievable (ALARA): a philosophy followed to achieve making every reasonable effort to maintain exposures to ionizing radiation as far below the dose limits as practical. A practice to ensure consistency with the purpose for which the licensed activity is undertaken, taking into account the state of technology, the economics of improvements in relation to the state of technology, the economics of improvements in relation to benefits to the public health and safety, and other societal and socioeconomic considerations. These means are in relation to utilization of nuclear energy and licensed materials in the public interest.

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.” The energy that is released through a nuclear reaction or radioactive decay process. More specifically, it 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).

Background radiation: the natural radiation that is always present in the environment. It includes cosmic radiation which comes from the sun and stars, terrestrial radiation which comes from the Earth, and internal radiation which exists in all living things. The typical average individual exposure in the United States from natural background sources is about 300 millirems per year.

Best practice: peer-validated techniques, procedures, and solutions that prove successful and are solidly grounded in actual experience in operations, training, and exercises.

Beta particle: a charged particle (with a mass equal to 1/1837 that of a proton) that is emitted from a nucleus of a radioactive element during radioactive decay (or disintegration) of an unstable atom. 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. Beta particles may be stopped by thin sheets of metal or plastic.

Beta radiation: comes from the emission of beta particles during radioactive decay. Beta particles are highly energetic and fast-moving. They carry a positive or negative charge and can be stopped by a layer of clothing or few millimeters of a solid material. Beta particles can penetrate the skin and cause skin burns, but tissue damage is limited by their small size. Beta particles are most hazardous when inhaled or ingested.

Biennial: every two calendar years.

Biennial Preparedness Report: a FEMA-developed product that includes ORO input as appropriate. This report describes the overall assessment of offsite preparedness by core capabilities for the entire biennial assessment period; essentially a compilation of the evaluation reports.

Buffer zone: an area adjacent to a restricted zone where residents may temporarily re-enter, but for which protective measures are recommended to minimize exposure to radiation. The buffer zone serves as an area in which response and recovery efforts are staged and coordinated, and provides an area to conduct decontamination efforts to prevent the spread of contamination to unrestricted areas.

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 adjustment, as necessary, of a measuring device such that it responds within the required range and accuracy to known values of input.

Capability targets: performance thresholds for each core capability. REP Program-specific capability targets are derived from the planning standards of 44 CFR 350, support evaluation criteria from NUREG-0654/FEMA-REP-1, Rev. 2, and are used as the baseline for assessing ORO preparedness in terms of core capabilities.

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.

Check source: a radioisotope with a known, relatively fixed activity level used to determine the responsiveness of survey instruments.

Chronic radiation exposure: exposure to small doses of radiation over an extended period of time.

Combined license (COL): a combined construction permit and operating license with conditions for a nuclear power facility issued under Subpart C of 10 CFR Part 52.

Command and control: management of emergency response functions within a particular context (e.g., an EOC) through leadership and use of authority.

Commercial nuclear power plant (NPP): a facility licensed by the NRC to use a nuclear reactor to produce electricity.

Committed effective dose: the sum of the committed equivalent doses following intake (inhalation or ingestion) of a radionuclide to each organ multiplied by a tissue weighting factor.

Communication links: a channel that connects two or more devices. This link may be an actual physical link, or it may be a logical link that uses one or more physical links or shares a physical link with other telecommunications links. A communication link is generally one of several types of information transmission paths such as those provided by communication satellites, radio communications infrastructure, and/or computer networks to connect two or more points.

Concept of operations: delineation of an organization's roles and responsibilities and how the organization will function to accomplish those responsibilities.

Concepts and Objectives (C&O) Meeting: the formal beginning of the exercise planning process. It is held to identify the scope and objectives of the exercise. For less complex exercises and for organizations with limited resources, the C&O Meeting can be conducted in conjunction with the IPM.

Congregate care: the provision of temporary housing and basic necessities for evacuees.

Congregate care center: a facility for temporary housing, care, and feeding of evacuees.

Containment: a physical structure surrounding a reactor that is designed to prevent or control the release of radioactive material.

Contaminated: the condition resulting from the adhesion of radioactive particulates to the surface of structures, objects, soil, water, or living organisms (people, animals, or plants).

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, Rev. 2 evaluation criteria J.13 and K.1.e; or (2) contaminated and otherwise physically injured. Individuals exposed to high levels of radiation may be injured, but not contaminated.

Contamination: undesirable radioactive material (with a potentially harmful effect) that is either airborne or deposited in (or on the surface of) structures, objects, soil, water, or living organisms (people, animals, or plants) in a concentration that may harm people, equipment, or the environment.

Continuous: action carried out without stopping or interruption.

Control room: the area in an NPP from which most of the plant power production and emergency safety equipment can be operated remotely.

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: in operations-based and some complex discussion-based exercises, controllers plan and manage exercise play, set up and operate the exercise incident site, and possibly take the roles of individuals and agencies not actually participating in the exercise. Controllers direct the pace of exercise play, provide key data to players, and may prompt or initiate certain player actions and injects to the players as described in the MSEL to ensure exercise continuity. Controllers issue exercise materials to players as needed, monitor the exercise timeline, and supervise the safety of all exercise participants. Controllers are the only participants who should provide information or direction to players. All controllers should be accountable to one senior controller.

Controller/Evaluator (C/E) briefing: this is a pre-exercise overview for controllers, evaluators, and the exercise administrative staff. The briefing summarizes the C/E Handbook and focuses on explaining the roles and responsibilities of controllers and evaluators.

Controller/Evaluator (C/E) Handbook: specifically describes the roles and responsibilities of exercise controllers and evaluators and the procedures they must follow. Because the C/E Handbook contains information about the scenario and about exercise administration, it is distributed to only those individuals specifically designated as controllers or evaluators.

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.

Cooperating organization: an organization supplying assistance other than direct operational or support functions or resources to the incident management effort.

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 National Preparedness Goal.

Core capability-neutral: can be aligned with any core capability.

Corrective action: a concrete, actionable step that is intended to resolve emergency preparedness program gaps and shortcomings experienced in drills, exercises, or actual events.

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).

Credentialing framework: provides an administrative standard to validate qualifications of prospective REP Program evaluators and plan reviewers, ensuring that specific requirements are met to successfully evaluate an exercise or review a plan.

Critical task: distinct elements required to perform a capability target.

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): a unit used to measure the intensity of radioactivity in a sample of material, equal to 37 billion (3.7×10^{10}) disintegrations per second.

Debrief: immediately following the exercise, a short debriefing should be conducted with exercise planning team members to ascertain their level of satisfaction with the exercise, discuss any issues or concerns, and propose improvements.

Decay (radioactive): the decrease in the radiation intensity of any radioactive material with respect to time.

Decontamination: a process used to reduce, remove, or neutralize radiological, chemical, or biological contamination to reduce the risk of exposure.

Decontamination station: a building or location suitably equipped and organized where personnel and material are cleansed of chemical, biological, or radiological contaminants.

Department of Energy (DOE): responsible for maintaining a safe, secure and effective nuclear deterrent and reducing the threat of nuclear proliferation, overseeing the United States’ energy supply, carrying out the environmental clean-up from the Cold War nuclear mission, and the 17 National Laboratories.

Department of Health and Human Services (HHS): responsible for enhancing the health and well-being of all Americans, by providing for effective health and human services and by fostering sound, sustained advances in the sciences underlying medicine, public health, and social services.

Derived intervention level (DIL): concentration derived from the intervention level of dose at which the FDA 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 PAG, 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 PAG.

Design report: the part of the ANS Evaluation Report where the physical means and technical components of the ANS are detailed.

Direction and control: the management of emergency functions within a particular context (e.g., an EOC) through leadership and use of authority.

Direct-reading dosimeter (DRD): a small ionization detection instrument that indicates radiation exposure directly and can be read in real time by the user. Also referred to as a “pocket dosimeter.”

Disaster-initiated review (DIR): as addressed in the FEMA/NRC MOU, the DIR’s purpose is to formally determine the offsite emergency response infrastructure and capabilities to effectively implement approved emergency plans.

Dose: the quantity of energy absorbed from ionization per unit mass of tissue; a general term, which may be used to refer to the amount of energy absorbed by an object or person per unit mass. Known as the “absorbed dose,” this reflects the amount of energy that ionizing radiation sources deposit in materials through which they pass, and is measured in units of rad; the amount of radiation exposure a person has received, calculated considering the effectiveness of the radiation type (alpha, beta, gamma), the timeframe of the exposure, and the sensitivity of the person or individual organs.

Dose limits for emergency workers: the allowable accumulated dose during the entire period of the incident.

Dose rate: the radiation dose delivered per unit of time, measured for example in rem per hour.

Dosimeter: a small portable instrument (such as a film badge, TLD, or electronic dosimeter) used to measure and record the total accumulated personal dose of ionizing radiation.

Dosimetry: the theory and application of the principles and techniques involved in measuring and recording doses of ionizing radiation.

Drill: a coordinated, supervised activity usually employed to validate a specific operation or function in a single agency or organization. Drills are commonly used to provide training on new equipment, develop or validate new policies or procedures, or practice and maintain current skills.

Early phase: the beginning of a radiological incident for which immediate decisions for effective use of protective actions are required and must therefore be based primarily on the status of the radiological incident and the prognosis for worsening conditions. This phase may last from hours to days.

Early site permit (ESP): a permit through which the NRC addresses site safety, environmental protection, and emergency preparedness issues, in order to approve one or more proposed sites for a nuclear power facility, independent of a specific nuclear plant design or an application for a construction permit or COL. An ESP is valid for 10 to 20 years, but can be renewed for an additional 10 to 20 years.

Effective dose: 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. Usually considered as the external dose to the whole body.

Electron: a stable, negatively charged elementary particle of matter. Electrons orbit the positively charged nucleus of the atom.

Emergency: an unexpected event during the operation of an NPP that has a significant effect on the safety of the facility, personnel, or the public.

Emergency action level (EAL): a pre-determined, site-specific, observable threshold for an initiating condition that, when met or exceeded, places the plant in a given ECL.

Emergency Alert System (EAS): is a national public warning system that requires broadcasters, cable television systems, wireless cable systems, satellite digital audio radio service providers, and direct broadcast satellite providers to provide the President with communications capability to address the American people within 10 minutes during a national emergency. The system also may be used by state and local authorities, in cooperation with the broadcast community, to deliver important emergency information, such as weather information, AMBER alerts and local incident information targeted to specific areas.

Emergency classification level (ECL): one of a set of names or titles established by the NRC for grouping off-normal events or conditions according to potential or actual effects or consequences and resulting onsite and offsite response actions. The four ECLs used for commercial NPPs, in ascending order of severity, are: NOUE, Alert, SAE, and GE.

Emergency operations center (EOC): a facility that is the primary base of emergency operations for an ORO in a radiological incident.

Emergency operations facility (EOF): a support facility for the management of overall licensee emergency response (including coordination with Federal, state, local, and tribal government officials), coordination of radiological and environmental assessments, and determination of recommended public protective actions.

Emergency planning zone (EPZ): as defined in 10 CFR 50.47(c)(2) (45 FR 55409, August 19, 1980) and 44 CFR 350.7(b) (48 FR 44338, September 28, 1983).

Emergency Response Data System (ERDS): a direct near real-time electronic data link between the licensee's onsite computer system and the NRC Operations Center that provides for the automated transmission of a limited data set of selected plant parameters.

Emergency response network: generic term used to refer to communications systems, including hardwired and wireless telephone networks, broadcast and cable television, radios, mobile radios, satellite systems, and increasingly the Internet.

Emergency response organization (ERO): the personnel assigned to perform tasks and activities associated with implementation of a licensee's emergency plan for coping with radiological incidents.

Emergency response planning area: see planning area.

Emergency worker: an individual who has an essential mission to protect the health and safety of the public, and who could be exposed to ionizing radiation from the plume or from its deposition. Emergency workers may or may not be individuals normally exposed to ionizing radiation as a part of their occupations. Ultimately, state and local authorities designate what categories of workers are classified as emergency workers. Emergency workers may include law enforcement personnel, radiation monitoring personnel, firefighters, health services personnel, EOC personnel, and animal care specialists.

Environmental Protection Agency (EPA): the mission of the EPA is to protect human health and the environment. The EPA is responsible for coordinating Federal environmental response and cleanup for nuclear/radiological incidents.

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): the urgent removal of people from an area to avoid or reduce high-level, short-term exposure, from the plume or from deposited radioactivity. Evacuation may be a preemptive action taken in response to a facility condition rather than an actual release.

Evacuation time estimate (ETE): a calculation of the time it would take to evacuate the public within the plume exposure pathway EPZ 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 planning process.

Evaluation criteria (NUREG-0654/FEMA-REP-1, Rev. 2): describe approaches that FEMA and NRC consider acceptable for use in implementing specific parts of each of the agencies' regulations, particularly the 16 planning standards. They are not a substitute for regulations, and compliance is recommended but not required.

Evaluation report: describes the evaluators' observations, provides an evaluation of the successfulness of the activity by objectives/capability targets, and may include recommendations for improvements.

Evaluator: a qualified individual who observes, measures, and assesses performance, captures issues, and analyzes results and outcomes. Evaluators assess and document players' performance against plans/procedures and objectives and capability targets.

Exception area: an area located approximately 5 to 10 miles from an NPP and specifically designated in an ORO'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 EPZ. OROs must have the capability to complete alert and notification of the public in approved exception areas within 45 minutes.

Exclusion area: the area surrounding the reactor where the licensee has the authority to determine all activities, including exclusion or removal of personnel and property.

Exercise: an instrument to train for, assess, practice, and improve performance in prevention, protection, mitigation, response, and recovery capabilities. Exercises can be used for testing and validating policies, plans, procedures, training, equipment, and interagency agreements; clarifying and training personnel in roles and responsibilities; improving interagency coordination and communications; improving individual performance; identifying gaps in resources; and identifying opportunities for improvement.

Exercise evaluation guides (EEGs): documents that support the exercise evaluation process by providing evaluators with consistent standards for observation, analysis, and AAR/IP development. Each EEG is linked to a core capability.

Exercise Plan (ExPlan): an ExPlan is a general information document that helps operations-based exercises run smoothly by providing participants with a synopsis of the exercise. It is published and distributed to the participating organizations following development of most of the critical elements of the exercise. In addition to addressing exercise objectives and scope, an ExPlan assigns activities and responsibilities for exercise planning, conduct, and evaluation. The ExPlan is intended to be seen by the exercise players and observers—therefore, it does not contain detailed scenario information that may reduce the realism of the exercise.

Exercise planning team: the exercise planning team is responsible for the successful execution of all aspects of an individual exercise. The planning team determines exercise objectives and core capabilities, creates a realistic scenario to achieve the exercise objectives, and develops documents to guide exercise conduct and evaluation. The planning team's organization and management principles should include clearly defined roles and responsibilities and a manageable span of control.

Exposure: 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 rate of charge production from ionizing radiation per unit mass of air (e.g., the amount of gamma radiation that an individual would be exposed to in one hour as measured in air), commonly expressed in roentgens per hour (R/h) or milliroentgens per hour (mR/h).

Extent-of-play agreement: a document negotiated during the exercise planning process that customizes the default performance expectations found in the objectives and capability targets. The extent-of-play agreement may include identification of the capability targets that will or will not be evaluated during the exercise, entities responsible for demonstrating specific targets, equipment (including vehicles to be used), personnel to be deployed, facilities to be activated, etc.

Federal Bureau of Investigation (FBI): the domestic intelligence and security service of the United States, and its principal Federal law enforcement agency. Operating under the jurisdiction of the U. S. Department of Justice, the FBI is also a member of the U.S. Intelligence Community and reports to both the Attorney General and the Director of National Intelligence. The FBI has jurisdiction over violations of more than 200 categories of Federal crimes.

Federal Emergency Management Agency (FEMA): the agency responsible for establishing Federal policies for and coordinating emergency planning, management, mitigation, and assistance functions of executive agencies. FEMA assists state, local, and tribal government agencies in their emergency planning. Its primary role is one of coordinating Federal, state, local, and tribal governments and volunteer response actions. FEMA is part of DHS.

Federal organization: an agency or department of the U.S. Federal government, or its component(s), having a role in emergency planning and preparedness.

Federal Radiological Monitoring and Assessment Center (FRMAC): a center usually located at an airport near the scene of a radiological emergency from which the DOE Offsite Technical Director conducts the NRF 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 Preparedness Coordinating Committee (FRPCC): the national-level coordination mechanism to provide technical assistance to OROs (see 44 CFR Part 351).

Field team coordinator: the individual who manages the functions of field teams and coordinates data with the dose assessment group located in EOCs and other operational facilities.

Field monitoring team (FMT): a group used to detect and monitor radiation in the environment (e.g., measure radiation levels in the air, water, vegetation, soil, etc.).

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 TLD is a type of film badge.

Final Planning Meeting (FPM): the FPM is the final forum for reviewing exercise processes and procedures. An FPM should be conducted for all exercises to ensure that all elements of the exercise are ready for conduct. Prior to the FPM, the exercise planning team receives final drafts of all exercise materials. No major changes to exercise's design, scope, or supporting documentation should take place at or following the FPM. The FPM ensures that all logistical requirements have been met, outstanding issues have been identified and resolved, and exercise products are ready for printing.

Final Safety Analysis Report (FSAR): included as part of each application for an operating license. The FSAR includes information that describes the facility, presents the design bases and the limits on its operation, and presents a safety analysis of the structures, systems, and components and of the facility as a whole.

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.

Fixed contamination: contamination that remains after loose contamination has been removed by decontamination.

Fixed nuclear facility: a facility not under control of a Federal agency.

Food and Drug Administration (FDA): is responsible for protecting the public health by ensuring the safety, efficacy, and security of human and veterinary drugs, biological products, and medical devices; and by ensuring the safety of the nation's food supply, cosmetics, and products that emit radiation.

Food chain: the pathway of any material through the environment to edible plants, animals, and ultimately to humans.

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 NPP is tested; and (3) the implementation of the observable portions of state, local, and tribal plans/procedures is tested.

Full-scale exercise: are typically the most complex and resource-intensive type of exercise. They involve multiple agencies, organizations, and jurisdictions and validate many facets of preparedness. FSEs often include many players operating under cooperative systems such as the ICS or Unified Command.

Functional exercise: exercises designed to validate and evaluate capabilities, multiple functions and/or sub-functions, or interdependent groups of functions. FEs are typically focused on exercising plans, policies, procedures, and staff members involved in management, direction, command, and control functions. In FEs, events are projected through an exercise scenario with event updates that drive activity at the management level. An FE is conducted in a realistic, real-time environment; however, movement of personnel and equipment is usually simulated.

Functional needs support services (FNSS): services that enable individuals to maintain their usual level of independence in a general population shelter. FNSS includes reasonable modifications to policies, practices, procedures, durable medical equipment, consumable medical supplies, personal assistance services, 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.

Gamma radiation: from the emission of high-energy, weightless, chargeless photons during radioactive decay. Gamma photons are pure electromagnetic energy and highly penetrating—several inches of lead or a few feet of concrete may be required to attenuate them. External exposure to gamma rays poses a health threat to the entire body. Inhalation and ingestion of gamma emitters also poses a health threat.

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.

Gamma spectroscopy systems: the NIST is equipped with a high resolution gamma-ray spectrometry system used for activity and impurity measurements of gamma-ray emitting sources used for NPPs, medical, and homeland security applications, as well as development of standard reference materials.

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): an ECL indicating that events are in progress or have occurred which involve actual or imminent substantial core degradation or melting with potential for loss of containment integrity or hostile action that results in an actual loss of physical control of the facility. Releases can be reasonably expected to exceed EPA PAG exposure levels offsite for more than the immediate site area.

Geographic information system (GIS): a system designed to capture, store, manipulate, analyze, manage, and present all types of geographical data.

Geo-targeting: the practice of delivering content to a user based on his or her geographic location.

Gray (Gy): one of the two units used to measure the amount of radiation absorbed by an object or person, known as the “absorbed dose,” which reflects the amount of energy that radioactive sources (with any type of ionizing radiation) deposit in materials (e.g., water, tissue, air) through which they pass. One gray is the international system of units (SI) equivalent of 100 rads, which is equal to an absorbed dose of 1 joule/kilogram. An absorbed dose of 0.01 Gy means that 1 gram of material absorbed 100 ergs of energy (a small but measurable amount) as a result of exposure to radiation.

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.

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 DHS to coordinate with other Federal departments and agencies, as well as state, local, and tribal governments to establish the NRF and NIMS.

Host/support jurisdiction: a geographical area that is at least 5 miles, and preferably 10 miles, beyond the boundaries of the plume exposure pathway EPZ (i.e., 15-20 miles from the commercial NPP) where functions such as congregate care, radiological monitoring, decontamination, and registration are conducted.

Hostile action: an act directed toward an NPP 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 after an exercise among exercise players. It captures 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.

Implementing procedure: instructions that provide a detailed description, often including checklists, of the operations that are to be conducted by either a specific group of individuals or a designated position.

Improvement Plan (IP): identifies specific corrective actions, assigns them to responsible parties, and establishes target dates for their completion. The IP is developed in conjunction with the AAR.

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 planning standard and/or associated NUREG-0654/FEMA-REP-1 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, wild land and urban fires, floods, HAZMAT 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 Commander: the Incident Commander is the individual responsible for on-scene incident activities, including developing incident objectives and ordering and releasing resources. The Incident Commander has overall authority and responsibility for conducting incident operations.

Incident command post (ICP): the field location where the primary functions of incident command are performed. The ICP may be co-located with the Incident Base or other incident facilities.

Incident command system (ICS): a standardized approach to the command, control, and coordination of on-scene incident management, providing a common hierarchy within which personnel from multiple organizations can be effective. ICS is the combination of procedures, personnel, facilities, equipment, and communications operating within a common organizational structure, designed to aid in the management of on-scene resources during incidents. It is used for all kinds of incidents and is applicable to small, as well as large and complex, incidents, including planned events.

Ingestion exposure pathway: the principal exposure from this pathway would be from ingestion of contaminated water or foods, such as milk or fresh vegetables. The duration of potential exposure could range in length from hours to months to even years.

Ingestion exposure pathway EPZ: a geographic area, approximately 50 miles in radius, including and surrounding a commercial NPP, within which the health and safety of the general public could be adversely affected through the ingestion of water or food that has been contaminated through exposure to radiation, primarily from the deposition of radioisotopes after a radiological incident.

Ingestion exposure pathway exercise: exercises include mobilization of state, local, and tribal government personnel and resources and implementation of emergency plans to demonstrate response capabilities to a release of radioactive materials requiring post-plume phase protective actions within the ingestion exposure pathway EPZ. These exercises are conducted at least once every eight years, see evaluation criterion N.2.b for additional information.

Initial Planning Meeting (IPM): marks the beginning of the exercise development phase. An IPM's purpose is to determine exercise scope by gathering input from the exercise planning team; design requirements and conditions (e.g., assumptions and artificialities); objectives; extent-of-play; and scenario variables (e.g., time, location, hazard selection). The IPM is also used to develop exercise documentation by obtaining the planning team's input on exercise location, schedule, duration, and other relevant details.

Initiating condition: a plant state or situation that indicates a radiological emergency, or event(s) that could lead to a radiological emergency, has occurred.

Injects: MSEL events that prompt players to implement the plans, policies, and procedures that planners want the exercise to validate. Exercise controllers provide injects to exercise players to drive exercise play toward achievement of objectives. Injects can be written, oral, televised, and/or transmitted via any means (e.g., fax, phone, e-mail, voice, radio). Injects can be contextual or contingency.

Institutionalized individual: a person who resides in an institution, such as a nursing home or correctional facility, and who may need to depend on others for assistance with taking protective actions. An institutionalized individual may or may not have access and 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.

Intermediate phase: the period beginning after the source and releases have been brought under control (has not necessarily stopped but is no longer growing) and reliable environmental measurements are available for use as a basis for decisions on protective actions and extending until these additional protective actions are no longer needed. This phase may overlap the early phase and late phase and may last from weeks to months.

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.

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 ions. 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 location that facilitates operation of the JIS, where personnel with public information responsibilities perform critical emergency information functions, crisis communications, and public affairs functions.

Joint information system (JIS): a structured approach to organizing, integrating, and delivering information that ensures that timely, accurate, accessible, and consistent messages can be delivered across multiple jurisdictions and/or disciplines to the media, NGOs, and the private sector. Critical supporting elements of the JIS include the plans, protocols, procedures, and structures used to provide public information.

Just-in-time training: instructions provided to personnel immediately prior to performing the assigned task or function.

Key skill: a capability necessary for implementing emergency response functions to protect public health and safety. For applicants/licensees, a listing of ERO key skills is provided in NSIR/DPR-ISG-01.

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 actions designed to reduce radiation levels in the environment to acceptable levels are commenced and ending when all recovery actions have been completed. This phase may extend from months to years. A PAG level, or dose to avoid, is not appropriate for long-term cleanup.

Lesson learned: knowledge and experience, positive or negative, derived from observations and historical study of operations, training, and exercises.

Letter of agreement (LOA): a document executed between two or more parties outlining specific agreements relating to the accomplishment of an action. REP LOAs may cover personnel, equipment, or other types of emergency support, and may take the form of letters, contracts, purchase orders, or other procurement mechanisms.

Level 1 Finding: an observed or identified inadequacy of organizational performance during an assessment activity that could cause 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 NPP.

Level 2 Finding: an observed or identified inadequacy of organizational performance during an assessment activity that is not considered, by itself, to adversely impact public health and safety.

Licensed day cares: a specialized program or facility that is licensed to provide 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.

Licensed material: source material, byproduct material, or special nuclear material that is received, possessed, used, transferred, or disposed of under a general or special license issued by the NRC or Agreement States.

Licensee: the utility or organization that has received from the NRC (1) a license to construct or operate a commercial NPP, (2) an ESP for a commercial NPP, (3) a combined license for a commercial NPP, or (4) any other NRC license that is now or may become subject to requirements for radiological emergency planning and preparedness activities.

Licensee ORO: a situation in which a licensee develops plans for and would implement offsite emergency response activities and functions because state, local, and/or tribal government organizations have declined to participate in the REP program. More information can be found in regulation under 10 CFR 50.47(c) and 44 CFR 352.

Local organization: a municipal, county, or regional government agency or office having a role in radiological emergency planning and preparedness, as defined in radiological emergency response plans.

Local government: the government of a town, city, county, or region at a local level led by locally elected politicians.

Master Scenario Events List (MSEL): a chronological timeline of expected actions and scripted events to be injected into exercise play by controllers to generate or prompt player activity. It ensures necessary events happen so that all objectives are met. Larger, more complex exercises may also use a procedural flow, which differs from the MSEL in that it contains only 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.

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/media facility: a designated facility staffed with individuals to serve as news media POCs and spokesperson(s) to interact with the media.

Medical services drill: these drills involve a simulated, contaminated emergency worker and/or member of the general public and contain provisions for participation by support services agencies (i.e., ambulance and offsite medical treatment facility). These drills are conducted annually at each medical facility designated in the emergency plan, and may be referred to as MS-1 drills. See evaluation criterion N.4.b for additional information.

Memorandum of understanding (MOU): a document which details the respective authorities and responsibilities of the signatory organizations for specified radiological emergency response planning, preparedness, or response.

Met: the jurisdiction or functional entity performed all activities under the objective/capability target to the level required per the work plan and/or the extent-of-play agreement, with no Level 1 or Level 2 Findings evaluated under that objective/capability target during the current activity and no unresolved prior Level 2 Findings.

Micro (μ): 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 (1×10^{-6} m).

Microcurie (μCi): a one-millionth part of a curie (see curie).

Midterm Planning Meeting (MPM): this exercise planning meeting may be held in preparation for more complex exercises to review the scenario timeline and focus on MSEL development. A MSEL Meeting can be held in conjunction with or separate from the MPM to review the scenario timeline for the exercise.

Milli (m): 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 [R]).

Mobilized (organization): an organization that has completed the activation process and is able to carry out the essential emergency functions, as needed 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 exposure pathway EPZ 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.

Narrative: a body of text, prepared by the evaluator, to describe an organization’s performance and document in narrative form the events that transpired during the assessment activity. The narrative also identifies and describes pertinent issues (Level 1 Findings, Level 2 Findings, or Plan Issues) and recommends appropriate corrective actions for each issue identified.

National Exercise Program (NEP): the NEP’s mission is to serve as the principal exercise mechanism for examining the preparedness and measuring the readiness of the United States across the entire homeland security enterprise by designing, coordinating, conducting, and evaluating a progressive cycle of exercises that rigorously test the Nation’s ability to perform missions or functions that prevent, protect against, respond to, recover from, and mitigate all hazards.

National Incident Management System (NIMS): a systematic, proactive approach to guide all levels of government, NGOs, and the private sector to work together to prevent, protect against, mitigate, respond to, and recover from the effects of incidents. NIMS provides stakeholders across the whole community with the shared vocabulary, systems, and processes to successfully deliver the capabilities described in the NPS. NIMS provides a consistent foundation for dealing with all incidents, ranging from daily occurrences to incidents requiring a coordinated Federal response.

National Planning Frameworks: guidance documents for each of the five preparedness mission areas that describe how the whole community works together to achieve the National Preparedness Goal. The Frameworks foster a shared understanding of roles and responsibilities, from the firehouse to the White House, and clarifies how the Nation coordinates, shares information, and works together—ultimately resulting in a more secure and resilient Nation.

National Preparedness Goal: a DHS/FEMA doctrine describing what it means for the whole community to be prepared for the types of incidents that pose the greatest threat to the security of the Nation, including acts of terrorism and emergencies and disasters, regardless of cause. The goal itself is: “A secure and resilient Nation with the 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.”

National Preparedness System (NPS): an organized process to achieve the National Preparedness Goal of a secure and resilient Nation.

National Response Framework (NRF): the guiding principles, roles, and structures that enable all domestic incident response partners to prepare for and provide a unified national response to disasters and emergencies. It describes how the Federal government, states, tribal governments, communities, and private sector work together to coordinate a national response. The framework builds upon the scalable, flexible, and adaptable concepts identified in NIMS, which provides a template for managing incidents.

Neutron: an uncharged particle found in the nucleus of every atom heavier than hydrogen. Neutrons sustain the fission chain reaction in a reactor.

News media point of contact: designated licensee, state, local, and/or tribal individuals to serve as primary points of contact for the media to contact with their inquiries.

Noble gases: the chemically inert radioactive gases that are released during an accident at a NPP; a group of elemental gases that are tasteless, odorless, and that do not undergo chemical reactions under natural conditions. The noble gases consist of Helium (He), Neon (Ne), Argon (Ar), Krypton (Kr), Xenon (Xe), and Radon (Rn); a gaseous chemical element that does not readily enter into chemical combination with other elements; an inert gas.

Non-governmental organization (NGO): is any non-profit, voluntary citizens' group which is organized on a local, national, or international level. Task-oriented and driven by people with a common interest, NGOs perform a variety of service and humanitarian functions, bring citizen concerns to Governments, advocate and monitor policies and encourage political participation through provision of information. Some are organized around specific issues, such as human rights, environment or health. They provide analysis and expertise, serve as early warning mechanisms and help monitor and implement international agreements. Their relationship with offices and agencies of the United Nations system differs depending on their goals, their venue and the mandate of a particular institution.

Non-participating ORO: an ORO that is not involved in emergency planning and preparedness for incidents at a commercial NPP.

Not demonstrated: describes when the jurisdiction or functional entity did not perform assessment activities under the objective/capability target as specified in extent-of-play agreements.

Notification: distributing an instructional message, either through the EAS or some other system.

Notification and mobilization of emergency 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): an ECL indicating that events are in progress or have occurred which indicate a potential degradation of the level of safety of the plant 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. This term is sometimes shortened to Unusual Event (UE) or other similar site-specific terminology. The terms Notification of Unusual Event, NOUE, Unusual Event, and UE are used interchangeably.

Notifying the public: distributing an instructional message, either through the EAS or some other means (i.e., verbally, electronically, digitally, etc.).

Nuclear/Radiological Incident Annex (NRIA): provides guidance and serves as a reference for federal agency planning efforts involving nuclear/radiological incidents. Other stakeholders (e.g., local, state, tribal, territorial, and insular area governments; NGOs; voluntary agencies; and the private sector) engaged in their own planning will find this document useful in enhancing their understanding of how the NRIA will be implemented and how their planning efforts can be complementary.

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.

Nuclear Regulatory Commission (NRC): the Federal agency that regulates commercial NPPs and other uses of nuclear materials, such as in nuclear medicine, through licensing, inspection, and enforcement of its requirements.

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.

NUREG-series publication: non-sensitive information related to the NRC's mission that does not contain regulatory requirements and is published in a formal agency series to ensure the "dissemination to the public of scientific and technical information relating to atomic energy..." as mandated by the Atomic Energy Act of 1954, as amended. Each publication bears an agency designator (NUREG number and sometimes a revision number).

Objective: the distinct outcomes an organization wishes to achieve during an assessment activity.

Observer: does not directly participate in the exercise; rather, observes 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 controller or public information officer should be assigned to manage these groups. In a discussion-based exercise, observers may support the development of player responses to the situation during the discussion by delivering messages or citing references.

Occupational dose: the internal and external dose of ionizing radiation received by workers in the course of employment in such areas as fuel cycle facilities, industrial radiography, nuclear medicine, radiological materials inspectors, and NPPs. These workers are exposed to varying amounts of radiation, depending on their jobs and the sources with which they work. The NRC requires its licensees to limit occupational exposure to 5,000 mrem (50 mSv) per year. Occupational dose does not include the dose received from natural background sources, doses received as a medical patient or participant in medical research programs, or "second-hand doses" received through exposure to individuals treated with radioactive materials.

Offsite: beyond the boundaries of the owner-controlled area around a commercial NPP.

Offsite response organization (ORO): any state, local, or tribal governmental organization; private or voluntary organization; or licensee ORO formed when state, local, and/or tribal governments choose not to participate in the REP Program; that is responsible for carrying out emergency response 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 (OCA) of a commercial NPP.

Onsite personnel: licensee or contract personnel working at commercial NPPs.

Operational: status of a facility (e.g., EOC, EOF, 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.

Operations Support Center (OSC): a licensee onsite emergency response facility provided for maintenance and other support personnel to gather as a ready resource to support emergency response actions.

Owner controlled area (OCA): all areas contiguous to the commercial NPP that are owned or leased by the licensee (or by any of its associated business units) over which the licensee exercises control. The OCA is usually larger than, and encompasses, the exclusion area.

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 EALs and communication capabilities among affected OROs and the licensee.

Participants: the overarching group that includes all players, controllers, evaluators, and staff members involved in conducting an exercise.

Participant briefing: conducted after the biennial exercise as an opportunity to present OROs with initial exercise results.

Permanent record dosimeter (PRD): a device designed to be worn by a single individual for the assessment of radiation dose from external sources of radiation and evaluated 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. Film badges, TLDs, and OSLDs are examples of PRDs.

Personally identifiable information (PII): as defined in Office of Management and Budget Memorandum M-07-1616, refers to information that can be used to distinguish or trace an individual's identity, either alone or when combined with other personal or identifying information that is linked or linkable to a specific individual. The definition of PII is not anchored to any single category of information or technology. Rather, it requires a case-by-case assessment of the specific risk that an individual can be identified.

Pet: a domesticated animal, such as a dog, cat, bird, rabbit, rodent, or turtle that is traditionally kept in the home for pleasure rather than for commercial purposes, can travel in commercial carriers, and can be housed in temporary facilities. Household pets do not include reptiles (except turtles), amphibians, fish, insects/arachnids, farm animals (including horses), and animals kept for racing purposes.

Plan: may refer to REP plans, response plans, emergency plans, emergency response plans, emergency operations plans, and all-hazards plans as they relate to radiological emergency response and preparedness in support of NPPs.

Plan issue: an observed or identified inadequacy in the ORO's emergency plan/implementing procedures, rather than that of the ORO's performance.

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.

Plan review: review of offsite plans/procedures annually for consistency.

Planning reference: originates in NUREG-0654/FEMA-REP-1, Rev. 2; planning references provide trace-back to the appropriate planning standards and demonstrate where and how the capability targets support regulatory compliance with the planning standards.

Planning standard: an emergency planning element or attribute that must be met in onsite and offsite emergency plans and preparedness programs. The planning standards are found in NRC regulations at 10 CFR 50.47 and FEMA regulations at 44 CFR 350.5.

Plans/procedures: includes radiological emergency preparedness and response plans that are associated with implementing procedures such as 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. OROs may either incorporate procedural detail into the main plans or into separate procedural documents at its discretion.

Player: has an active role in preventing, responding to, or recovering from the risks and hazards presented in the scenario, by either discussing or performing 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 an NPP, from a radiological incident, 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 incident, primary emphasis is given to the development of protective actions against the release of noble gases and volatiles, such as radio-iodines. This cloud is not visible to the eye, but can be measured, or "seen" with radiation measurement equipment.

Plume phase: see early phase.

Plume exposure pathway: the means by which whole body radiation exposure occurs as a result of immersion in a gaseous release of radioactive material. The principal exposure sources from this pathway are: (a) whole body external exposure to gamma radiation from the plume and from deposited materials, and (b) inhalation exposure from the passing radioactive plume. The duration of principal potential exposures could range in length from 30 minutes to days.

Plume exposure pathway EPZ: a geographic area, approximately 10 miles in radius, including and surrounding a commercial NPP within which the health and safety of the general public could be adversely affected by direct whole body external exposure to gamma radiation from the plume and from deposited materials, as well as inhalation exposure from the passing radioactive plume during a radiological incident.

Plume exposure pathway exercise: these exercises are conducted biennially. These exercises include mobilization of licensee, state, local, and tribal government personnel and resources and implementation of emergency plans to demonstrate response capabilities within the plume exposure pathway EPZ. See evaluation criterion N.2.a for additional information.

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.

Point of review: specific observable tasks that are used by the evaluator(s) to determine successful demonstration of capability.

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-Katrina Emergency Management Reform Act of 2006 (PKEMRA): amends the Homeland Security Act of 2002 to make extensive revisions to emergency response provisions while keeping FEMA within DHS. PKEMRA significantly reorganizes FEMA, providing it substantial new authority to remedy gaps in response, and includes a more robust preparedness mission for FEMA.

Post-plume phase: the period that includes response activities (such as limiting exposure from ingestion of contaminated food and water, relocation, reentry, and return) occurring after a radiological release has been terminated.

Potassium iodide (KI): a prophylactic compound 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. Commonly referred to as a radioprotective drug.

Precautionary protective actions: any preventive or protective action implemented without the verification of radionuclide measurements by field monitoring or laboratory analysis. For additional information, see J.11.g on page 102.

Presidential Policy Directive-8 (PPD-8): This directive replaces 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. This directive was signed on March 30, 2011.

Principal organization: the nuclear utility (licensee) and any Federal, state, local, and tribal government agency, department, or executive office having a major or lead role in emergency planning and preparedness.

Private sector organization: an industry group or entity, volunteer group, quasi-governmental body, etc. having a role in emergency planning and preparedness.

Procedures: an organization's documented implementing instructions for managing its internal response to emergencies and coordinating its external response with other organizations. The term "procedures" as used in this document includes implementing procedures, standard operating procedures, administrative procedures, maintenance procedures, and testing procedures.

Projected dose: the prediction of the dose that a population or individual could receive.

Protected area: the NPP area under continuous access monitoring and control by the licensee, and armed protection as described in the site security plan.

Protective action: an action taken to avoid or reduce projected dose, isolate food to prevent its introduction into commerce and to determine whether condemnation or other disposition is appropriate, and/or prevent or reduce contamination of milk, food, and drinking water such as covering water sources and providing dairy cows with stored feed. See also protective measure.

Protective action decision (PAD): measures taken in anticipation of, or in response to, a release of radioactive material to the environment. The purpose of a PAD 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 pathway EPZ for limiting exposure from contaminated food and water in the ingestion exposure pathway EPZ.

Protective action guide (PAG): the projected dose to an individual, resulting from a radiological incident at which a specific protective action to reduce or avoid that dose is warranted.

Protective action recommendation (PAR): an advisement from an NPP licensee and OROs with responsibilities to conduct radiological accident assessment to state, local, and/or tribal government officials, concerning emergency response measures that should be taken to protect the public from exposure to radiation.

Protective measure: an action taken in the event of a radiological emergency at, or related to, an NPP to protect the public from exposure to radiation. See also protective action.

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 primary components of atomic nuclei. The atomic number of an atom is equal to the number of protons in its nucleus.

Public information: information provided to the general public on a periodic basis concerning what they should know about radiation and how to respond to a radiological emergency. This would include topics such as educational information about radiation, who to contact for additional information, and what their actions should be in an actual emergency.

Public Information Officer (PIO): a member of the Command Staff who serves as the conduit for information to internal and external stakeholders, including the media or other organizations seeking information directly from the incident or event.

Radiation absorbed dose (rad): 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 emergency area (REA): an area in a medical facility for monitoring, decontamination, and the treatment of a potentially contaminated, injured, and potentially exposed emergency workers and members of the general public.

Radiation protection: the protection of people from the effects of exposure to ionizing radiation, and the means for achieving this.

Radio Amateur Civil Emergency Service (RACES): a protocol created by FEMA and the Federal Communications Commission (FCC Part 97, Section 407). Many government agencies across the country train their Auxiliary Communications Service (ACS) volunteers using the RACES protocol. The volunteers serve their respective jurisdictions pursuant to guidelines and mandates established by local emergency management officials. RACES volunteer operators are activated by local, county, and state jurisdictions and are the only Amateur Radio operators authorized to transmit during declared emergencies when the President of the United States specifically invokes the War Powers Act.

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 form of an element that decays or disintegrates spontaneously, emitting radiation. Approximately 5000 natural and artificial radioisotopes have been identified.

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 Preparedness (REP) exercise: an event involving organizational responses to a simulated commercial NPP incident with radiological consequences. The purpose of an exercise is to test the integrated capabilities of onsite and OROs to implement emergency functions set forth in their radiological emergency response plans/procedures.

Radiological Emergency Preparedness (REP) Program: refers to both FEMA and NRC programs that administer emergency preparedness for commercial NPPs and surrounding areas and encompasses the plans, training, exercises, and resources necessary to prepare emergency response personnel to rapidly identify, evaluate, and respond to radiological emergencies.

Radiological survey: the directed effort to determine the distribution of radiological material and dose rates in an area.

Radionuclide: a radioactive isotope of a particular element.

Radioprotective drug: a chemical compound or substance serving to protect or aid in protecting against the injurious effects of radiation.

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 SAE or GE.

Reasonable assurance: a determination that NRC licensee or applicant onsite plans and state, local, and tribal government and utility offsite plans and preparedness are adequate to protect public health and safety in the emergency planning areas of a commercial NPP.

Reception/relocation center (RC): a pre-designated facility located outside the plume exposure pathway EPZ (at a minimum distance of 15 miles from the NPP) 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.

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. More broadly, recovery is accomplished through the timely restoration, strengthening, and revitalization of infrastructure, housing, and a sustainable economy, as well as the health, social, cultural, historic, and environmental fabric of communities affected by a catastrophic incident.

Recovery plan: a plan to restore an incident-affected area or community.

Reentry: workers or members of the public going into a relocation or radiological contaminated areas on a temporary basis under controlled conditions.

Regional Assistance Committee (RAC): a group of representatives from a number of Federal agencies that have agreed to assist the FEMA Regions in providing technical assistance to OROs and to evaluate radiological emergency response plans/procedures and exercises on the basis of their special authorities, missions, and expertise.

Release: escape of radioactive materials into the environment.

Release rate: the measure of the amount of radioactive material dispersed per unit of time.

Relocation: the removal or continued exclusion of people (households) from contaminated areas to avoid chronic radiation exposure.

Relocation area: areas where people (households) have been removed or excluded to avoid chronic radiation exposure. May also be referred to as Restricted Area.

Relocation center (RC): see reception/relocation center.

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 Level 1 findings.

Reoccupancy: the return of households and communities to relocation areas during the cleanup process, at radiation levels acceptable to the community.

REP Branch Chief: FEMA Headquarters individual responsible for implementation of the national FEMA REP Program.

Responsible ORO: an organization designated in emergency response plans/procedures as the organization responsible for a specific emergency function.

Restricted area: any area to which access is controlled for the protection of individuals from exposure to radiation and radioactive materials.

Restricted zone: an area of controlled access from which the population has been evacuated, relocated, or sheltered-in-place.

Return: permanent resettlement in evacuation or relocation areas with no restrictions, based on acceptable environmental and public health conditions.

Robert T. Stafford Disaster Relief and Emergency

Assistance Act (Stafford Act): signed into law November 23, 1988; amends the Disaster Relief Act of 1974, Pub. L. 93-288. This Act constitutes the statutory authority for most Federal disaster response activities, especially as they pertain to FEMA and FEMA programs.

Roentgen (R): a unit of exposure of gamma (or X-ray) radiation in field dosimetry. One roentgen is essentially equal to one rad. A unit for measuring the amount of radiation energy imparted to a volume of air. The roentgen can only be used to measure X-rays or gamma rays.

Roentgen equivalent man (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.

Rumors: information circulated by individuals and organizations during an emergency that may or may not be true.

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 capabilities.

Schools: in the context of the REP Program, the term “schools” refers to public and private schools, and licensed or government-supported preschools.

Service animal: any dog that is individually trained to do work or perform tasks for the benefit of an individual with a disability, including a physical, sensory, psychiatric, intellectual, or other mental disability. Other species of animals, whether wild or domestic, trained or untrained, are not service animals for the purposes of this definition. The work or tasks performed by a service animal must be directly related to the handler’s disability. Examples of work or tasks include, but are not limited to, assisting individuals who are blind or have low vision with navigation and other tasks, alerting individuals who are deaf or hard of hearing to the presence of people or sounds, providing non-violent protection or rescue work, pulling a wheelchair, assisting an individual during a seizure, alerting individuals to the

presence of allergens, retrieving items such as medicine or the telephone, providing physical support and assistance with balance and stability to individuals with mobility disabilities, and helping persons with psychiatric and neurological disabilities by preventing or interrupting impulsive or destructive behaviors. The crime deterrent effects of an animal’s presence and the provision of emotional support, well-being, comfort, or companionship do not constitute work or tasks for the purposes of this definition.

Shadow evacuation: voluntary evacuation of people from areas surrounding officially declared evacuation zone, in absence of an official directing an evacuation in that area.

Shelter-in-place: a protective action that includes going indoors, listening to an EAS radio or television station, closing all windows and doors, closing exterior vents, and turning off heating and air conditioning equipment using outside air.

Shield: any material or obstruction that absorbs radiation and thus tends to protect personnel or materials from the effects of ionizing radiation.

Sievert (Sv): the international system (SI) unit for dose equivalent equal to 1 Joule/Kilogram. 1 sievert= 100 rem.

Site Area Emergency (SAE): an ECL indicating that events are in progress or have occurred which involve an actual or likely major failure of plant functions needed for protection of the public or hostile action that results 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. Any releases are not expected to result in exposure levels which exceed EPA PAG exposure levels beyond the site boundary.

Site boundary: the line beyond which the land or property is not owned, leased, or otherwise controlled by the licensee.

Source term: the amount of a contaminant available in a scenario or actually released to the environment.

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 exposure pathway EPZ that need to be considered separately from the general population when planning for an incident or accident at an NPP.

Special nuclear material: by law, includes plutonium, uranium-233, and uranium containing more than the natural concentration of uranium-235.

Spent fuel pool: a structure that provides onsite storage for spent nuclear fuel. These pools are robust constructions made of reinforced concrete several feet thick, with steel liners. The water is typically about 40 feet deep, and serves both to shield the radiation and cool the fuel rods.

Spokesperson: participates and/or leads regular news briefings and conferences on behalf of an agency (state, county, municipality, company, or group), and are fully prepared with current information and incident facts, incident messages, and incident management roles and responsibilities. Spokespersons may include incident management leadership and public affairs professionals.

Staff assistance visit (SAV): visits that provide assistance to OROs. A SAV may be initiated by the FEMA Regional Office or requested by the OROs. The purpose of the SAV may include a wide range of topics, a few examples are: providing technical assistance to the OROs regarding their plans/procedures or their implementation; and supporting development or completion of state requests for plan/procedure approval under 44 CFR Part 350.

Standard operating guideline (SOG): see implementing procedures.

State of emergency: a situation of national danger or disaster in which a government suspends normal constitutional procedures in order to regain control.

State organization: the state government agency or office having the principal or lead role in emergency planning and preparedness. This includes any state or commonwealth of the United States, the District of Columbia, the Commonwealth of Puerto Rico, the Virgin Islands, Guam, American Samoa, the Commonwealth of the Northern Mariana Islands, and any possession of the United States.

Stay indoors: the use of a structure to temporarily separate individuals from a hazard or threat, along with instructions to monitor media for additional information.

Stay time: the period during which personnel may remain in a restricted or contaminated area before accumulating a pre-identified permissible exposure or dose.

Strength: an observed action, behavior, procedure, and/or practice that is worthy of special notice and recognition.

Strontium (Sr): 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.

Submersion: to sink or plunge under water or beneath the surface of any enveloping medium.

Support organization: any organization, such as an agency, department, office, or local jurisdiction, having a supportive role to the principal or lead organization(s) in emergency planning and preparedness.

Survey meter: a portable instrument used in radiological monitoring to detect and measure ionizing radiation.

Tabletop exercise (TTX): typically held in an informal setting intended to generate discussion of various issues regarding a hypothetical, simulated emergency. TTXs can be used to enhance general awareness, validate plans and procedures, rehearse concepts, and/or assess the types of systems needed to guide the prevention of, protection from, mitigation of, response to, and recovery from a defined incident. Generally, TTXs are aimed at facilitating conceptual understanding, identifying strengths and areas for improvement, and/or achieving changes in attitudes.

Technical Support Center (TSC): an onsite facility that provides plant management and technical support to the reactor operating personnel located in the control room during emergency conditions.

The Joint Commission: an independent, not-for-profit organization that accredits and certifies health care organizations and programs in the United States. Joint Commission accreditation and certification is recognized nationwide as a symbol of quality that reflects an organization's commitment to meeting certain performance standards.

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.

Threat and Hazard Identification and Risk Assessment (THIRA): a comprehensive guide to identifying and addressing risks and impacts through the whole community approach; this is a joint effort between Federal, state, local, and tribal governments, and territorial organizations.

Thyroid: a large ductless gland in the neck which secretes hormones regulating growth and development through the rate of metabolism.

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 AAR, of the time at which significant events occurred at all participating OROs in a biennial REP exercise.

Timely (timely manner): performing appropriate actions with a sense of urgency and without undue delay.

Total effective dose (TED): sum of the effective dose and committed effective dose to the whole body.

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): 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.

Training and Exercise Planning Workshop (TEPW): usually conducted to create a multi-year TEP. At a TEPW, stakeholders work together in a collaborative workshop environment to identify and set exercise program priorities based on core capabilities. Based on these program priorities, TEPW stakeholders develop a multi-year schedule of specific training and exercises.

Transient (population): a person or persons who do not permanently reside in the plume exposure pathway EPZ, but may be present during an emergency.

Tribal government: a Federally-recognized American Indian and Alaska Native tribal government. A listing of Federally-recognized Indian tribal entities can be found in the Tribal Directory maintained on the U.S. Department of the Interior, Indian Affairs' webpage (www.bia.gov).

Trigger/action levels: 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.

Uranium (U): an element of the periodic table. There are two primary isotopes: uranium-238, which accounts for 99 percent of all uranium; and uranium-235, the fissionable isotope that sustains the fission reaction in a nuclear reactor.

Voluntary Organizations Active in Disasters (VOADs): an association of organizations that mitigate and alleviate the impact of disasters; provides a forum promoting cooperation, communication, coordination and collaboration; and fosters more effective delivery of services to communities affected by disaster.

Whole body dose: see total effective dose (TED).

Whole community: a focus on enabling the participation in incident management activities of a wide range of players from the private and nonprofit sectors, including NGOs and the general public, in conjunction with the participation of all levels of government, to foster better coordination and working relationships.

Wireless Emergency Alert (WEA) system: delivers emergency messages sent by authorized government alerting authorities through your mobile carrier. Types of alerts include: extreme weather and other threatening emergencies; AMBER Alerts; and Presidential Alerts during a national emergency.

Work plan: describes which objectives/capability targets will be assigned to each activity and which core capabilities will be assessed by each capability target. The work plan guides the overall assessment of preparedness by core capabilities and the results of those assessments ultimately build the Biennial Preparedness Report.

Written agreement: see letter of agreement (LOA).

X-ray: a penetrating form of electromagnetic radiation that is used in medical and industrial applications.

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Appendix C: Authorities and 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 the current edition of the RPM, please see Appendix D.

FEMA-Specific Legislative Authorities

- Homeland Security Act of 2002, Pub. L. No. 107-296 (2002) (codified as amended at 6 U.S.C. § 101 et seq.).
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- 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.”
- 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).”
- 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.”
- 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).”
- Memorandum from J.D. Overstreet to Julius Becton dated November 20, 1987 on “Radiological Emergency Preparedness Policy on Interim Findings.”
- Memorandum from Joe Flynn (OGC) to Dennis Kwiatkowski dated April 6, 1994 on “Impact of OSHA’s HAZMAT Standard on REP Program.”
- Memorandum from Joseph Moreland to Office of Natural and Technological Hazards Division Chiefs on March 5, 1993 on “Draft GM RG-2 ‘Guidelines for Regional Implementation of the FEMA Rule, 44 CFR Part 352.’”

- Memorandum from Joseph Mouhaun to Associate Directors of Region I and III on April 2, 1984 Memo on “Radiation Hazards.”
- Memorandum from Julius Beckton Jr. to Regional Directors dated December 31, 1987 on “Policy on Interim and 350 Findings and Determinations.”
- Memorandum from Julius Becton Jr. to Regional Directors dated November 4, 1987 on “Policy on Interim and 350 Findings and Determinations.”
- 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.”
- Memorandum from Kay Goss to Regional Directors dated June 23, 1997 on “Monitoring of Radiation Exposure by States.”
- Memorandum from Kay Goss to Regional Directors dated March 17, 1995 on “Distribution of Portal Monitor Standard Documents.”
- 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).”
- Memorandum from Louis O. Giuffride to Regional Directors on October 18, 1981 on “Procedural Policy on Radiological Emergency Preparedness.”
- 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.”
- 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.”
- Memorandum from Richard Donovan to Robert Wilkerson dated August 19, 1986 on “Exercise Objective ‘Total Population Exposure’.”
- Memorandum from Richard Krimm to Edward Jordan dated December 11, 1986 on “Generic Safety Concerns regarding Alert and Notification Systems.”
- Memorandum from Richard Krimm to Edward Thomas dated June 20, 1988 on “Annual Letter of Certification” (includes criteria and references a checklist).
- Memorandum from Richard Krimm to Frank Begley dated December 7, 1988 on “Landmark Descriptions.”
- Memorandum from Richard Krimm to Frank Begley dated December 9, 1987 on “Quad Cities Emergency Planning Zone (EPZ) Boundary Determination (split jurisdiction).”
- Memorandum from Richard Krimm to Frank Begley dated February 26, 1988 on “Annual Letter of Certification.”
- Memorandum from Richard Krimm to Frank Begley dated January 5, 1988 on “Radiological Monitoring.”
- Memorandum from Richard Krimm to Frank Begley dated March 24, 1988 on “Peak Transient Populations.”
- Memorandum from Richard Krimm to Frank Begley dated March 4, 1988 on “Radiological Monitoring.”
- Memorandum from Richard Krimm to Frank Begley dated September 19, 1988 on “Radiological Monitoring.”
- 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.”
- Memorandum from Richard Krimm to Frank Begley dated September 23, 1987 on “Alternate Emergency Operations Center (EOC).”
- Memorandum from Richard Krimm to Frank Finch dated May 17, 1985, on “Congregate Care Facilities.”
- Memorandum from Richard Krimm to Glen Woodard on September 9, 1988 on “June 13, 1988 Memorandum on Guidance Memorandum MS-1, Medical Services.”

- Memorandum from Richard Krimm to Glenn Woodard dated April 22, 1986 on “Clarification of the 15-Minute Design Objective for Alert and Notification Systems.”
- 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.”
- 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.”
- Memorandum from Richard Krimm to Regional Directors and ONTH Chiefs dated February 5, 1987 on “Annual Letter of Certification (ALC).”
- Memorandum from Richard Krimm to Regional Directors dated October 13, 1993 on “Adequate Demonstration of Objective 16 at Radiological Emergency Preparedness Exercises.”
- 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.”
- Memorandum from Richard Krimm to Wallace Weaver dated May 03, 1988 on “REP Issues from Region V.”
- Memorandum from Richard Krimm to Warren, undated, on “Granting Credit for Objectives 32 and 33.”
- Memorandum from Richard Leonard to file on June 20, 1989 on “Rationale for Iowa Temporary Relocation Center (TRC) Spaces for the FT Calhoun Stations.”
- Memorandum from Richard Leonard to Rick Semm on June 27, 1989 on “Bus Drivers as Emergency Workers.”
- Memorandum from Richard Leonard to State Directors and staff on May 8, 1989 on “Demonstration of Objective 16, Use of KI.”
- Memorandum from Richard Leonard to State Directors on March 19, 1990 on “Requirement of landmark Descriptions in REP Plans.”
- 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.”
- Memorandum from Robert Fletcher to Charles Biggs dated February 23, 1995 on “Request for Exemption on Back-up Medical Facilities.”
- Memorandum from Robert Fletcher to Charles Biggs dated March 9, 1995 on “EPA Manual of Protective Action Guides and Retrospective Determinations of Total Dose.”
- 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.”
- Memorandum from Robert Fletcher to Stuart Rifkind dated November 9, 1994 on “Clarification on Alert and Notification System-the Order of Sirens and EBS Messages.”
- Memorandum from Robert Wilkerson to Frank Begley dated December 23, 1986 on “Mobilization of Emergency Response Personnel.”
- Memorandum from Robert Wilkerson to Frank Begley dated September 12, 1986 on “Use of Landmark Descriptions in Public Information Releases.”
- Memorandum from Robert Wilkerson to Frank Begley on July 15, 1985 on “Five-year Exercise Requirement.”
- Memorandum from Robert Wilkerson to R. Dell Greer on April 30, 1985 on “State of Arkansas Questions on Population Exposure.”
- Memorandum from Robert Wilkerson to Region II RAC Chair dated April 7, 1995 on “Redundant Route Alerting.”
- Memorandum from Robert Wilkerson to Richard Leonard on October 23, 1985 “Guidance on Alert and Notification of Transient Populations within the Emergency Planning Zone.”

- 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.”
- Memorandum from Samuel Speck to John Coleman dated April 3, 1986 on “Radiological Emergency Preparedness (REP) Policy Issues.”
- 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.”
- Memorandum from Stephen Harrell to Dennis Kwiatkowski on October 7, 1991 on “Resolution of Open Region VII Requests for REP Guidance.”
- 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).”
- Memorandum from Vanessa Quinn to Woodie Curtis dated September 29, 1988 on “Alternative Approach by State of Michigan for Dose Assessment.”
- Memorandum from Vanessa Quinn to Woodie J. Curtis dated July 21, 2000 on “State of Illinois Determination on KI Inventory Potency.”
- Memorandum from Vern Wingert to Larry Robertson dated August 21, 1996 on “Dosimeter Guidance for Emergency Workers.”
- 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.”
- Memorandum from William Wark to Joseph Dominguez dated February 21, 1993 on “Annual Distribution of Emergency Information to the Public.”
- 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.”
- 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.
- Policy Statement on Disposal of Waste Water and Contaminated Products from Decontamination Activities, January 1989.
- Policy Statement on Respiratory Protection, November 22, 1985.

Other FEMA REP Guidance

- Radiological Emergency Preparedness Exercise Preparation Tool 3.0, 2013.
- Radiological Emergency Preparedness Program Credentialing Framework, December 2010.

Other Federal Agency Guidance

- 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, 1990.
- Memorandum of Understanding with Transportation Safety Board dated February 27, 1997.
- 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).”
- NUMARC/NESP-007, Revision 2 – Methodology for Development of Emergency Action Levels, January 1992.
- NUREG-75/014, Reactor Safety Study – An Assessment of Accident Risks in the U.S. Commercial Nuclear Power Plants, WASH-1400, October 1975.

Appendix E: List of Commercial Nuclear Power Plants

The following list of commercial 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 website 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

Site Code	Site Name	Number of Units	Location
24 033	Kewaunee Power Station	Operating: 1	Kewaunee, WI
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	Jenkinsville, 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



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