Radiological Operations Support Specialist (ROSS) – Emergency Operations Center Job Aid

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Executive Summary

This job aid is intended for use by a Radiological Operations Support Specialist (ROSS) working in an Emergency Operations Center (EOC) under the criteria of the National Incident Management System (NIMS) Multiagency Coordination System (MACS). NIMS defines EOCs as locations where staff from multiple agencies convene to address imminent threats and hazards and to provide coordinated support to incident command, on-scene personnel, and/or other EOCs. An EOC may be established at the local, county, state, or federal level of government, as well as in the private sector. The term 'Multiagency Coordination Center' is in most cases is synonymous with EOC.

This job aid will explain how the ROSS can support EOC functions and tasks and will provide guidance on how a ROSS will contribute radiological expertise and scientific support to decision-making in an EOC. The ROSS may provide recommendations, guidance, and interpretations, but official recommendations that lead to protective action decisions must come from the appropriate authority having jurisdiction (local, state, or federal). As explained in the National Response Framework (2016), *Nuclear/Radiological Incident Annex*, at the federal level, the Advisory Team for Food, Health, and the Environment (A-Team) is the official entity tasked with providing federal recommendations. The official entity for official recommendations and specific decision-making at the state and local level varies among jurisdictions. The ROSS may serve in the incident management structure with a capacity to make official recommendations and even decisions, for example in using certain resources in particular ways. The ROSS must determine with whom that authority for official recommendations and decision-making resides for the specific jurisdiction they are serving.

Connectivity to other ROSS Job Aids

This job aid complements two other job aids developed for the ROSS, called the *Incident Command System Initial Response Job Aid*, and the *Planning Process Job Aid* (as shown in Figure 1), but is different in how it is structured. The first two job aids were developed for a ROSS working at an Incident Command Post (ICP), with one focused on the initial response phase of an incident and the other focused on the development of an Incident Action Plan (IAP). This job aid focuses on the incident support and coordination function that occurs within an EOC, above the tactical and operational activities that occur at the incident or field level.

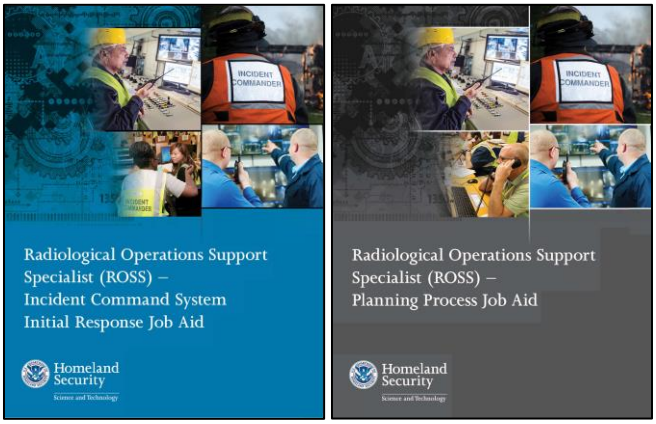


Figure 1: Other ROSS Job Aids

The other two job aids were developed around well-defined Incident Command System (ICS) processes making it easy to crosswalk ROSS functions with specific steps in the ICS process. NIMS is less prescriptive in EOC organization and process, so this this job aid focuses on generalities of typical MACS/EOC environments, which the ROSS will be working in. At an EOC the ROSS may be employed in a more broad and strategic role than at an ICP and this job aid was designed with that ambiguity in mind.

Table of Contents

How to Use this Job Aid

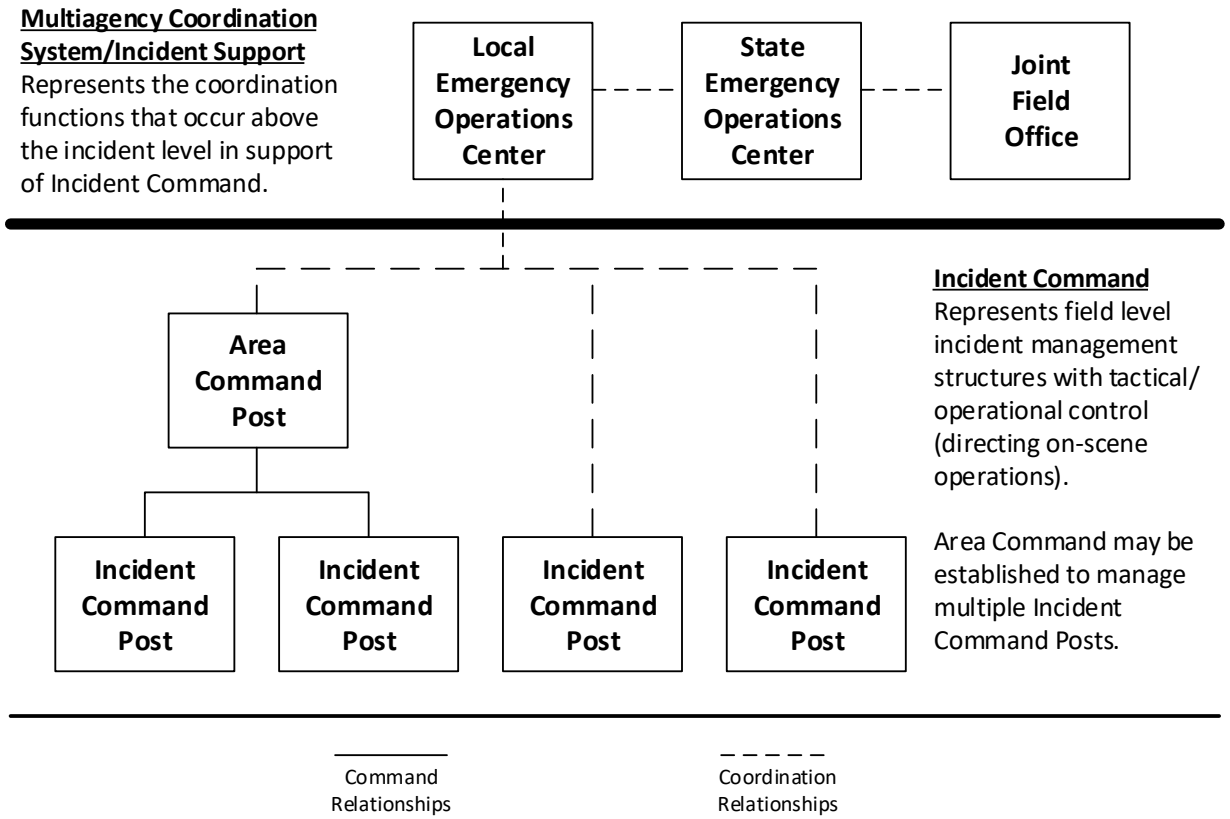
Users of this job aid should be familiar with the:

- Layout and general content of the material presented in this job aid before responding as a ROSS, and use it as a support tool while deployed as a ROSS in an EOC
- ROSS position and toolkit, including other job aids and resources in the ROSS toolkit that augment the information in this job aid

It is intended that users navigate directly to the portion of the job aid that they need to use, as opposed to following it cover-to-cover. When assigned to an EOC, users should:

- Determine how the EOC is organized and review the relevant EOC organization guidance included in this job aid
- Determine which function they will be assigned to support and review the relevant EOC functional guidance included in this job aid
- If the EOC is organized around Emergency Support Functions (ESFs), review the relevant ESF guidance included in this job aid for the ESFs with which the ROSS may interact

When assigned to a Multiagency Coordination (MAC) Group, users should consult the MAC Group portion of this job aid. Figure 2 is a simplified depiction of the National Response Framework Command and Coordination Structure consistent with NIMS principles. Below the solid black line are field level command posts where tactical/operational resources conduct on-scene, field level operations. Above the solid black line are coordination centers, such as local and state EOCs, that provide support to field level incident command entities and coordinate incident management activities above the field level. This job aid is intended for a ROSS working above the solid black line in either a local or state EOC.



This job aid is focused on activities above the solid black line (Multiagency Coordination System/Incident Support)

Figure 2: Command and Coordination Structure

Emergency Operations Center Overview

The Command and Coordination component of NIMS describes the systems, principles, and structures that provide a standard, national framework for incident management. Regardless of the size, complexity, or scope of the incident, effective command and coordination—using flexible and standard processes and systems—helps save lives, ensures unity of effort, promotes efficiency in the response, and helps stabilize the situation.

Incident command and coordination consists of four areas of responsibility:

1. Tactical activities to apply resources on-scene[1]
2. Incident support, typically conducted at EOCs, through operational and strategic coordination, resource acquisition, and information gathering, analysis, and sharing
3. Policy guidance and senior level decision-making
4. Outreach and communication with the media (traditional and social) to keep the public and stakeholders informed about the incident

The NIMS Command and Coordination component coordinates these four areas across the different NIMS functional elements:

1. ICS
2. EOCs
3. MAC Groups
4. Joint Information System

An EOC is typically where staff from multiple agencies convene to address imminent threats and hazards and to provide coordinated support to incident command, on-scene personnel, and/or other EOCs. Multiple EOCs may be activated during a response in different jurisdictions and at various levels of government. EOCs may be fixed locations, temporary facilities, or virtual structures with staff participating remotely. With severe damage to government infrastructure, for example after a nuclear detonation, the capacity to coordinate emergency response and recovery operations remotely or at *ad hoc* facilities may be absolutely essential.

The purpose, authorities, and composition of the teams that staff an EOC vary depending on the jurisdiction or organization and the nature and complexity of the incident or situation, but generally, the teams consolidate and exchange information, support decision-making, coordinate resources, and communicate with personnel on-scene and at other EOCs. Personnel at an EOC may support staff at:

- An ICP
- A field site in support of the incident (e.g., personnel conducting debris removal or managing a shelter), but is not affiliated with an ICP
- The Federal Radiological Monitoring Assessment Center (FRMAC)
- Other EOCs (e.g., staff in a state EOC communicating with staff in a local EOC)

[1] "On-Scene" refers to the scene of the incident were responders are taking direct operational and tactical actions to respond to the incident.

There are five primary functions of staff in an EOC, whether virtual or physical:

1. Collect, analyze, and share information
2. Support resource needs and requests, including allocation and tracking
3. Coordinate plans and determine current and future needs
4. In some cases, provide coordination and policy direction
5. Direct other necessary jurisdictional action (such as state of emergency declaration and public protective action decisions)

All EOCs receive oversight from elected and/or appointed officials such as a governor, tribal leader, mayor, city manager, or agency/company executive. These individuals may be present in the EOC, but more often provide guidance from elsewhere, individually or as part of a formal policy group. They typically establish priorities and make final decisions on issues such as emergency declarations, large-scale evacuations, access to extraordinary emergency funding, waivers to ordinances and regulations, and adjudication of scarce resources.

State EOC vs. Local EOC

While the primary functions are similar, there are differences between state and local EOCs that a ROSS should keep in mind while activated.

Local EOC

Local EOCs typically serve a municipality like a town, city, or a county. Capability amongst these EOCs varies widely. For large cities, the EOC may be a fixed facility with some constant level of minimal staffing, even during routine non-emergency circumstances. For smaller jurisdictions, the EOC may be temporarily established in a space normally used for other activities, and unstaffed unless specifically formed for an event or response.

Regardless of size, a local EOC coordinates the incident management activities within their respective jurisdiction. There is likely a close, and sometimes blurred, relationship and division of labor between the on-scene response in the field and the coordination and support efforts off-site at the local EOC. The local EOC will maintain situational awareness and a common operating picture. The local EOC will coordinate with neighboring jurisdictions for mutual aid, information sharing, and resource assistance. When their capabilities are overwhelmed, they will request assistance from the state EOC. Depending on the jurisdiction, there may not be any organic radiological response or scientific expertise present in the EOC.[2] While there will be some radiological expertise in a local jurisdiction or county with an operating nuclear facility it is unlikely for the nearby communities to have any inherent capability.

State EOC

Every state has a state EOC. In almost every case, the state EOC is located at, or near, the state capital. These EOCs monitor incidents throughout their state and provide assistance as requested by local jurisdictions. This assistance may come in the form of coordinating state-wide mutual aid and resource assistance from other municipalities within the state or providing state-level resources. The state EOC will maintain situational awareness and a common operating picture for the entire state. Should a federal disaster declaration be established, federal assistance to the state will be coordinated by the state EOC. The state EOC will also be the focal point for assistance provided by other states through state-to-state mutual aid compacts such as the Emergency Management Assistance Compact (EMAC).

[2] This is generally true, though not always the case, if the jurisdiction does not have any inherent radiological hazards such as a fixed nuclear facility or need to create response plans for the threats of terrorism, such as large urban areas.

Radiological response and/or scientific expertise at the EOC will vary by state:

- In a state that has one or more operating nuclear facilities, a state level EOC will likely include radiation protection professionals and a high degree of expertise
- In a state that does not host any fixed nuclear facilities and only regulates radioactive material, the EOC will likely have few radiation protection professionals with a high level of expertise in large-scale radiological emergencies and may have difficulty with 24/7 staffing by an expert
- In a state without any nuclear facilities, there may be a lack of radiological expertise to staff an EOC 24/7 in the event of a large-scale radiological emergency

EOC Staff Organization

EOC staff organization will vary widely depending on factors such as the authority of a jurisdiction/organization, staffing, partner and stakeholder agency representatives, physical facilities, communications capabilities, political considerations, and most importantly, the mission. Regardless of how the EOC staff is organized, in general it can be expected that they will operate consistently within the NIMS management principles.

There are three common ways to organize an EOC, as listed below. Additional information on these structures can be found in the EOC Organization section.

- ICS or ICS-like Structure: A variation on an ICS organizational structure with varying nuances and possible title changes to emphasize the coordination and support missions of EOCs.
- Incident Support Model (ISM) Structure: A variation of the ICS structure that separates the information management/situational awareness function from the ICS Planning Section and combines the functions of the ICS Operations and Logistics Sections.
- Departmental Structure: An organizational structure based on day-to-day departmental/agency structure and relationships in the jurisdiction.

ROSS EOC Initial Action Checklist

Upon arrival at an EOC, the ROSS should perform the following actions:

- ❑ Check-in at the EOC
- ❑ Meet with point of contact (POC) to introduce yourself and explain capabilities (elevator speech); the POC may be the EOC Director (or designee), individual who requested the ROSS, or the jurisdictional radiological response authority or radiation control program (e.g., health department, environmental department, etc.)
- ❑ Obtain situational awareness of what has occurred and what is happening
- ❑ Obtain an overview of the EOC organizational structure
    - How is the EOC organized?
    - What functions is the EOC performing?
    - What is the relationship between the EOC and the ICP?
- ❑ Identify potential areas where you could provide needed expertise and communicate this to POC
- ❑ Receive instructions from POC on how you can best support the response, and which functional areas of the EOC you will be supporting/interacting with
- ❑ Review relevant aspects of this job aid
- ❑ Coordinate logistics necessary to support (e.g., internet access, facility access, organizational identification such as vests, means of contact, etc.)
- ❑ Establish a work location in the EOC, begin work, and consult this job aid as necessary

Common Functions of an EOC

This section of the job aid will focus on common EOC functions inherent to all EOCs and highlight how the ROSS can contribute to these critical EOC functions. Regardless of where the ROSS is assigned to report, they should determine if there is a lead dose assessment/technical radiation cadre in place for the incident and coordinate closely with that group. The EOC functions that a ROSS may contribute to are:

- Situation Assessment and Coordination of Summary Information
- Priority Setting
- Resource Management
- Strategic Planning
- Public Messaging
- Policy Resolution
- Key Decisions
- Interface with Senior Executives and Elected/Appointed Officials
- Coordination with Other MACS Entities
- Dose Assessment/Technical Radiation Cadre

The following pages include ROSS-specific guidance and checklists for supporting each of these functions.

Situation Assessment and Coordination of Summary Information

Situation assessment includes the collection, processing, and display of all incident-related information needed to meet response and recovery objectives. This may take the form of consolidating situation reports, obtaining supplemental information, and preparing maps and status boards.

ROSS Actions

- ❑ Establish communication with the FRMAC Liaison (especially at the state level) or through the FRMAC Liaison Coordinator in the Consequence Management Home Team (CMHT) if FRMAC personnel are not yet on site. At the local level, this coordination may be through the state EOC or through the FRMAC Liaison Coordinator in the Consequence Management Home Team (CMHT). It is critical that the ROSS go through the proper channels in making these connections. Consult the CMHT Job Aid for further details
- ❑ Review what radiological response field teams are deployed and assess their field data for accuracy
- ❑ Ensure the most current and accurate radiological maps and data assessments are communicated and included in briefings, reports, and displays; this includes making sure old versions are removed from usage and archived when newer versions are available for use and display
- ❑ Encourage use of tools to promote a common operating picture (e.g., RadResponder, Interagency Modeling and Atmospheric Assessment Center [IMAAC]) in order to avoid use of conflicting or incomplete information
- ❑ Identify any limitations to current information (e.g., if data collectors do not have alpha detection capability)
- ❑ Identify relevant Essential Elements of Information (EEIs) to inform and maintain the radiological situational awareness and common operating picture
- ❑ Serve as a liaison to reach-back scientific support capabilities (e.g., National Atmospheric Release Advisory Center [NARAC], IMAAC, CMHT, FRMAC, Radiation Emergency Assistance Center/Training Site (REAC-TS), A-Team, etc.)
- ❑ Interpret and explain FRMAC data products to planners and decision-makers, understanding that they may not have a background in health physics
- ❑ Develop and deliver customized briefings to varying audiences and mission needs
- ❑ Identify the need for new assessments and data products to support the EOC; either communicate these requests to the FRMAC Liaison or work directly with EOC personnel to develop the product using FRMAC data
- ❑ Coordinate the transfer of Geographic Information System (GIS) information to/from the FRMAC Liaison (e.g., shape files, map layers, etc.) to assist in the development of customized data and map products
- ❑ Review data and map products to ensure radiological data is accurate
- ❑ Ensure technical information is proactively communicated to EOC staff who require technical information to make decisions in their respective positions (i.e., Safety Officer, Public Information Officer (PIO), etc.)
- ❑ If radiological data assessment and product development are occurring in the EOC, ensure coordination with the FRMAC Liaison

Note on Data Products

Maps that are incorporated into on-going situation briefings and static displays need to be periodically reviewed (at least every 24 hours) to ensure the most current map products are included. NARAC/IMAAC and FRMAC maps are updated frequently, especially in the earliest stages as new information from the field is assimilated. Failure to review these maps can result in obsolete maps continuing to be displayed. Additionally, NARAC/IMAAC and FRMAC produce a range of different map products and protective action guidance to support different types of decisions that need to be made. It is essential the ROSS ensures the proper map is being used for the task, decision, briefing, etc.

Priority Setting

Priority setting includes evaluating incident specifics, operational requirements, and resource needs to determine the order of activities. Typically, a process or procedure is established to coordinate with Area or Incident Commands to prioritize the incident demands for critical resources. Additional considerations for determining priorities include the following:

- Life-safety
- Radiation dose to responders and the public
- Protection and restoration of critical infrastructure (e.g., essential government facilities, energy infrastructure, communications infrastructure, transportation infrastructure, etc.)
- Environmental impacts to food, drinking water, agriculture, and livestock
- Economic impacts
- Other criteria established by the MACS

Priorities will cover the entire spectrum of the response and will be broader than the radiological considerations. The ROSS will not be responsible for setting the EOC priorities but may be asked to review or advise on priorities based on what is important from a radiological response or health and safety standpoint.

Response Priorities by Incident

Radiological Dispersal Device (RDD) and Other Small-Scale Incident

For an incident involving the release of radioactivity (e.g., RDD, transportation accident, accident at a licensed operating facility, etc.), the first priorities are immediate search and rescue of injured victims and lifesaving medical treatment. In general, for this category of incident, radiation monitoring is desirable but not necessary for the initial response phase, which may be complete in a relatively short period of time given the small scale of the incident. Unless the local jurisdiction has a trained and qualified ROSS among their response staff, initial response and life safety actions may be completed before the ROSS arrives at the EOC. At this point, the ROSS will have three priorities:

1. Assist with assessments of current and possibly adequate but incomplete field measurements on the extent of the impacted area
2. If the release caused contamination beyond a localized area, over the next 24 to 48 hours as more extensive and detailed radiation measurements are performed, help command staff interpret data and products produced to redefine the evacuated area based on a high-fidelity dose projection. Help decision-makers guide repatriation of evacuated populations in unaffected areas and define the population that may be impacted by the relocation protective action guidance
3. There will be questions about environmental impacts and decontamination, real or perceived, and the ROSS will assist planners and decision-makers to prioritize and plan responses to issues for the short term, as well as incorporating outside federal resources as they arrive to support recovery in the Intermediate phase

(Continued on the next page)

Response Priorities by Incident (continued)

Nuclear Power Plant

Reactor accident scenarios, such as Fukushima, typically do not result in a release of radioactive material immediately after the initiating event. In general, containment failure is expected to occur on a timeframe of many hours or days post-accident. The local or state authorities in communication with the utility plant EOC will make initial shelter or evacuation recommendations/decisions. This job aid assumes a ROSS will support the management of the health and safety of potentially large numbers of displaced persons, mitigate impacts to agriculture and potable water, population monitoring, and decontamination.

At the EOC the ROSS will have three priorities to assist the Command Staff:

1. Obtain and interpret the NARAC/IMAAC data products to assist decision-makers with shelter or evacuation orders, and request new data products via the FRMAC Liaison
2. Explain implications of current and postulated changes in plant conditions
3. Assist with development of the IAP and attributes to control dose to emergency workers

Nuclear Detonation

Due to the massive number of casualties and damage to infrastructure, lethal levels of fallout over a wide area, and widespread loss of basic services, the context for priorities and support by the ROSS is different from all other incidents complicated by radiation. The ROSS will also join a response in the EOC that will continue for a protracted period of time in the Emergency Phase. Initially the ROSS will support the EOC in the context of scarce resources before outside federal and other resources arrive and are functional.

At the EOC the ROSS will have five prioritized actions in this initial period:

1. Obtain and interpret the NARAC/IMAAC data products to assist decision-makers with triage decisions for shelter or evacuation orders, and request new data products via the FRMAC Liaison
2. Assist with situational awareness with respect to mission planning of areas affected by lethal and non-lethal levels of fallout, and uncontaminated and unaffected areas to stage and mount responses
3. Assist Command Staff with development of a response plan and attributes to control dose to emergency workers and make recommendations on alternative means to provide dosimetry until outside resources arrive with sufficient dosimetry equipment
4. Assist Command Staff with development of IAPs
5. Provide radiation protection support, as needed, throughout the functional areas of the EOC

Resource Management

In a nuclear or radiological incident, specialized radiological response resources will be in high demand and will be designated as critical resources. Designated critical resources will be acquired, if possible, from the involved agencies or jurisdictions. These agencies or jurisdictions may shift resources internally to match the prioritized incident needs. Resources available from incident sites in the process of demobilization may be shifted, for example, to higher priority incident sites. Resources may also be acquired from outside the affected area. Procedures for acquiring outside resources will vary, depending on such things as the agencies involved and written agreements.

ROSS Actions

- ❑ Assist Command Staff with understanding and interpreting projected or measured radiation dose to responders and the public and apply this information to resource allocation
- ❑ Determine radiological response resources and needs available within the jurisdiction (i.e., city, county, or state) for:
    - Dosimetry
    - Population monitoring
- ❑ Verify the assignment and allocation of the jurisdiction's radiological response resources
- ❑ Based on the current incident priorities, advise on the most efficient allocation of limited radiological response resources
- ❑ Identify additional radiological response resources that may be available through mutual aid
    - At a local EOC this could come from a neighboring jurisdiction (city or county) or it could be a request for state-level resources
    - At a state EOC this could be the identification of state-wide resources from local government, state resources, or interstate mutual aid through arrangements such as the EMAC
    - At a state EOC this could also be the identification of federal resources that need to be requested through appropriate federal channels (direct statutory authority or Stafford Act). If a Joint Field Office is established with a Radiological Branch or Chemical, Biological, Radiological, Nuclear Branch, coordinate with the Branch Director on federal radiological response resource requirements and allocation
    - Private sector radiological resources may be available from facilities such as nuclear shipyards, nuclear power plants, medical facilities, etc.
- ❑ Identify the need for additional ROSS within the EOC or at local facilities
- ❑ Assist in tracking resource allocation and the determination of the appropriate assignment of radiological response resources
- ❑ Explain capabilities and limitations of radiological response resources
- ❑ Assist in planning for resource allocation
- ❑ Advise on reassignment and reallocation of radiological response resources when they are no longer needed
- ❑ Coordinate with the ROSS at other EOCs on radiological response resource status to:
    - Identify available resources
    - Ensure efficient resource allocation across the entire response

Strategic Planning

EOCs must think strategically and holistically about the incident to anticipate future resource needs and incident impacts. This includes strategic and long-term planning.

At the appropriate time, the ROSS should prompt EOC leadership and planners to begin thinking about long-term issues such as:

- ❑ Population monitoring and establishing Community Reception Centers (CRCs)
- ❑ Management of dosimetry data for responders
- ❑ Decontamination
- ❑ Remediation
- ❑ Environmental impacts
- ❑ Economic impacts
- ❑ Debris removal and waste management
- ❑ Infrastructure restoration
- ❑ Ingestion pathway
- ❑ Food, water, and agriculture embargoes
- ❑ Radiological data management
- ❑ Long-term health monitoring
- ❑ Psychological health management
- ❑ Dose reconstruction
- ❑ Site remediation
- ❑ Late-phase resource requirements
- ❑ Transition to recovery

The majority of work, time, and human resources are likely to be expended in recovery, and in a wide array of areas of need. To support long term recovery, the ROSS may remain engaged for extended periods of time, with a variety of assignments including dose reconstruction, site remediation, and waste management for example.

Public Messaging

Public information must be coordinated and integrated across jurisdictions, agencies, and organizations; among federal, state, tribal, and local governments; and with non-governmental organizations (NGOs) and the private sector. Clear public messaging helps ensure that lifesaving measures, evacuation routes, protective action recommendations, and other public health and safety information are coordinated and communicated to numerous audiences in a timely and consistent manner. This is especially true during nuclear and radiological incidents when vital public health and life safety actions can be taken simply by communicating information to the public about the hazard and the precautions to take.

ROSS Actions

- ❑ Monitor public reporting (through traditional and social media) and validate the accuracy of the technical and radiological information; identify and report misinformation to the PIO
- ❑ Confirm what official public messages have been released in regards to the radiological hazard and identify necessary information to communicate with the public
- ❑ Work with public information officials to develop public messages that address radiological health and safety issues in clear, concise, and easy-to-understand language
- ❑ Periodically re-evaluate the public messaging as it relates to the nuclear or radiological hazard and work with public information officials to update public messages

Note on Public Messaging

The ROSS should avoid on-camera interviews or direct interactions with the media. This should be handled by a qualified PIO or official spokesperson. The ROSS should instead work with this individual(s) to prepare them to deliver the scientifically correct and understandable messages to the public.

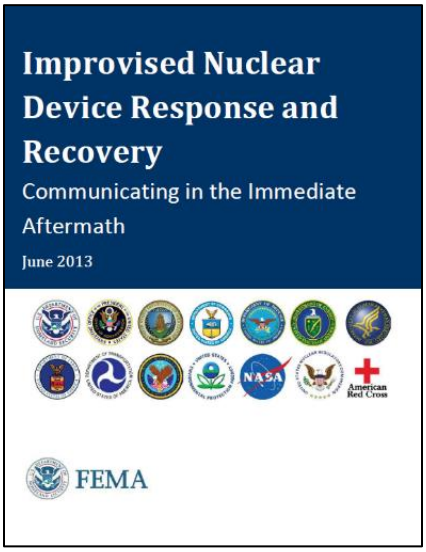


Figure 3: Cover image of the Improvised Nuclear Device Response and Recovery: Communicating in the Immediate Aftermath document.

The ROSS should be aware of tools available to PIOs, such as the *Improvised Nuclear Device Response and Recovery: Communicating in the Immediate Aftermath*. This document is designed as a tool for federal, state, local, tribal, and territorial officials and emergency responders who will interact with the media and the public following an improvised nuclear device (IND) incident, though it is useful for most nuclear responses. The pre-scripted key messages and questions and answers included in this document focus on saving lives and minimizing injury as well as addressing the concerns of the nation as a whole. If used across all levels of government, the consistency and accuracy will also build confidence and trust in the government's response. A similar document has been published for nuclear power plant accidents called *Communicating During and After a Nuclear Power Plant Incident.*

Policy Resolution

EOCs coordinate, support, and assist with policy-level decisions and interagency actions relevant to incident management activities, policies, priorities, and strategies.

Potential policy issues that may arise but are not limited to:

- ❑ Regulatory requirement exemptions
- ❑ Responder dose guidance and control of dose
- ❑ Personal protective equipment (PPE)
- ❑ Responder decontamination procedures
- ❑ Contaminated fatality management
- ❑ Contaminated debris removal
- ❑ Transition from emergency response to regulatory control and dose limits

Crisis Standards

In the medical community, "Crisis Standards of Care" is defined by the Institute of Medicine as a "substantial change in the usual health care operations and the level of care it is possible to deliver…justified by specific circumstances and…formally declared by a state government in recognition that crisis operations will be in effect for a sustained period." Crisis Standards of Care planned and implemented in accordance with ethical values are necessary for the allocation of scarce resources. Public health disasters justify temporarily adjusting practice standards and/or shifting the balance of ethical concerns to emphasize the needs of the community rather than the needs of individuals. See the U.S. Department of Health and Human Services, Crisis Standards of Care for additional information.

A similar approach to Crisis Standards of Care was adopted by the National Council on Radiation Protection and Measurements (NCRP) in Report-179, *Guidance for Emergency Response Dosimetry*, for a nuclear or radiological incident (especially after a nuclear detonation) where the demand for critical resources exceeds the capacity and existing policies may not adequately address the incident response realities (i.e., use of emergency response dose or decontamination requirements). In these rare instances, dosimetry and dose planning are not the same as in an occupational workplace. In the Emergency Phase the response to a terrorist incident will not likely find every responder being fully equipped with dosimetry and exposure rate monitoring instruments. Alternative means for dosimetry will be necessary such as group dosimetry and personnel accountability, time, and location. The lack of dosimetry resources would then be addressed in the IAP to control dose. Similarly, decontamination in the Emergency Phase will be situationally dependent and conducted with available resources.

Potential Policy Issues and Recommendations

Policy Topic	Issue
Responder Dose Guidance and Control of Dose	Coordinate with the Occupational Safety and Health Administration (OSHA) and/or relevant jurisdictional authority to implement Environmental Protection Agency (EPA) emergency dose guidance and NCRP Report-179 *Guidance for Responder Dosimetry* (NCRP 2017) and Commentary (expected publication February 2019). Large scale radiological incident response may require use of "decision points" versus "regulatory limits" for dose control. Current local guidance may have defined dose limits that may not be sufficient for incident response.
PPE	Guidance/policy may vary across departments/agencies resulting in inconsistent application of PPE across a multiagency response. Review various PPE policies against the operational requirements and recommend PPE requirements that adequately address incident-specific hazards.
Responder Decontamination Contaminated Fatality Management Contaminated Debris Removal	There are no regulatory requirements for the Emergency Phase. Identify jurisdictional stakeholders for these issues and develop incident specific policies/protocols that can be uniformly adopted to address these issues. The Centers for Disease Control and Prevention (CDC) has published guidance for contaminated fatality management and the EPA has developed guidance and tools for decontamination of most surfaces (e.g., Rad Decon App) and for estimating radioactive waste volumes (e.g.,Waste Estimation Support Tool).
Other Topics Not Identified	Identify jurisdictional stakeholders for the issue and develop incident specific policies/protocols that can be uniformly adopted to address these issues.

Key Decisions

Key decisions, not delegated to the local Incident Commander, may be elevated to the EOC to address. In these instances, the EOC will be in a position to make a key decision that could have broad implications across the entire response. Many of these decisions may relate to the radiological aspects of the incident and could require technical assistance from the ROSS.

Decisions may be significant enough that they are elevated above the EOC to senior executives and elected/appointed officials, who may be functioning in a MAC Group.

Key Decisions the ROSS Should Ensure are Considered by Appropriate Personnel

- ❑ Protective Action Decisions
- ❑ Responder Safety
  - Dose Guidance
  - Dose and Exposure Rate Decision Points
  - PPE
- ❑ Contamination Control and Decontamination Guidance
  - Public
  - Responders
- ❑ Critical Resource Allocation
- ❑ Location of Key Facilities for the Given Radiological Conditions
  - ICP(s)
  - Staging Area(s)
  - Joint Information Center (JIC)
  - CRC(s)
- ❑ Release of Technical Information
- ❑ Potable Water Restrictions
- ❑ Agricultural Embargos
- ❑ Exclusion Areas, Evacuation/Relocation Zones, etc.

Decision Support

In advance of these decisions, the ROSS should anticipate what they need to provide to the decision-making process to ensure a sound and timely decision may be made. This may require the ROSS to conduct a special briefing, seek a custom data or map product, or even request the assistance of another technical expert.

Interface with Senior Executives and Elected/Appointed Officials

EOCs must keep elected and appointed officials at all levels of government informed. Maintaining the awareness and support of these officials, particularly those from jurisdictions within the affected area, is extremely important, as scarce resources may need to move to an agency or jurisdiction with higher priorities.

ROSS Guidance

The ROSS may find themselves interacting directly with senior executives and elected/appointed officials to explain technical information and help inform decision-making. When interacting with senior executives and elected/appointed officials the ROSS should:

- ❑ Introduce themselves; briefly explain their role and their specific qualifications in radiation protection
- ❑ Request FRMAC data products that are customized for senior leaders
- ❑ Interpret and explain technical information in plain language; use of maps, displays, and short briefing papers/reports is encouraged
- ❑ Provide a range of options, when available
- ❑ Voice concern, where appropriate, but respect the decision of the executive or official
- ❑ Be mindful not to overstep their authority

Additional information related to interfacing with senior executives and elected/appointed officials is included in the MAC Group section of this job aid.

Coordination with Other MACS Entities

A critical part of MACS is outlining how each response node (i.e., ICP, local EOC, state EOC, federal EOC, etc.) will communicate and coordinate with other response nodes at the same level, the level above, and the level below.

ROSS Guidance

Multiple ROSS may be deployed to different response nodes during an incident, depending on the incident. Just as the EOC will be coordinating with other MACS entities (local EOCs, state EOC, ICP(s)), the ROSS should maintain close and frequent communication with other assigned ROSS to facilitate the "informal" exchange of radiological response information and to ensure a complete common operating picture is maintained across the entire response. Figure 4 shows formal incident management communications lines as well as how the ROSS provide coordinated radiological subject matter expertise and access to technical reach-back assets.

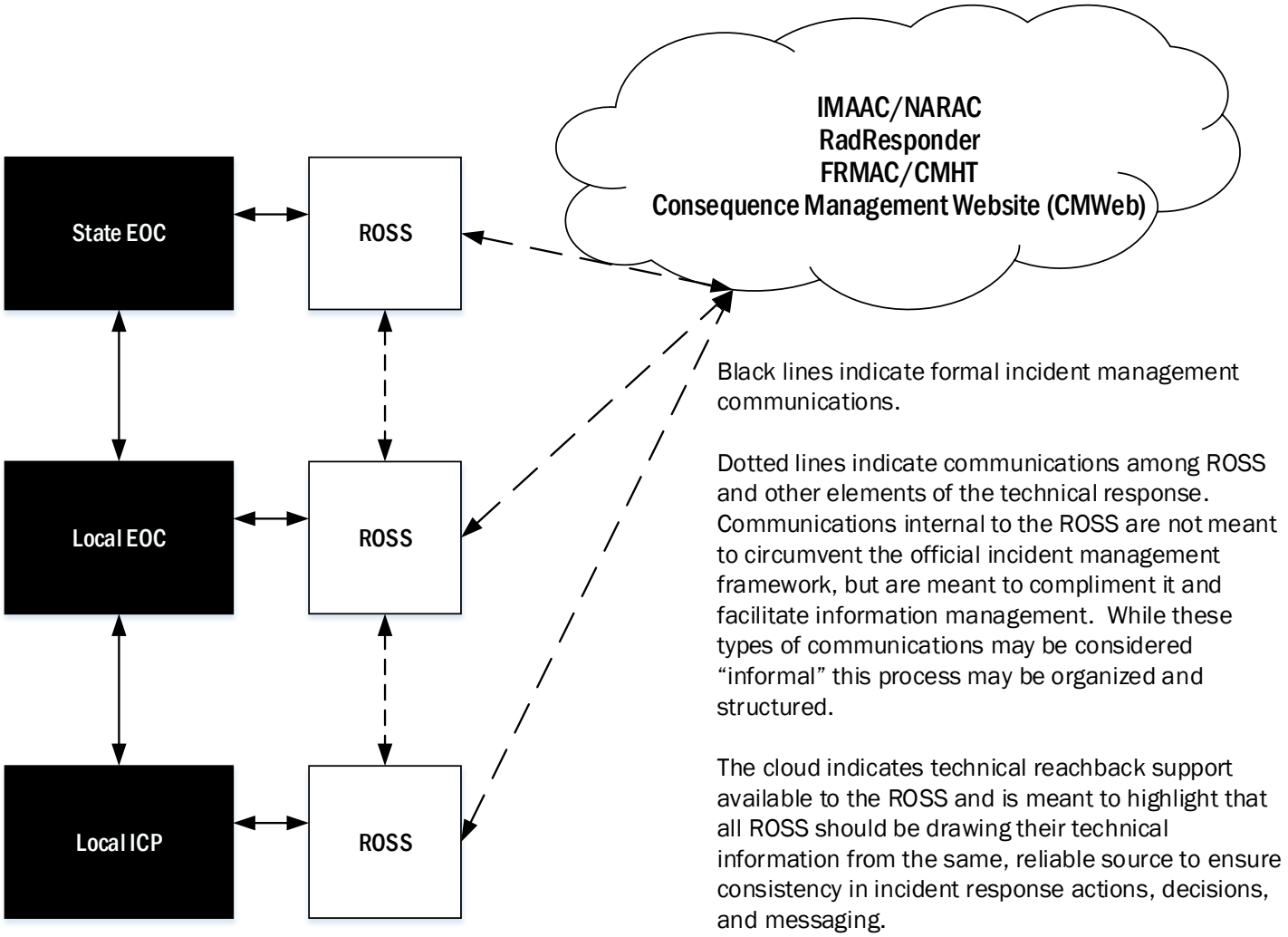


Figure 4: Incident Management Communications

Interface with Dose Assessment/Technical Radiation Cadre

EOCs, particularly state EOCs and larger local jurisdiction EOCs, will often have a group of technical radiation experts from within the state who will conduct dose assessment, field sampling, and other technical assessments specific to the radiation aspects of the incident. These technical groups are often comprised of state/local agency personnel with radiation related job duties but can also be supported by other radiation professionals. The technical cadre analyzes the radiation data to put the radiation risks in perspective for the incident response activities, generates information to advise on and support recommended protective actions, and coordinates with the FRMAC and other technical support from outside the state. This group is often assigned as the official technical advisor to decision and policy makers for radiation incidents within the jurisdiction.

ROSS Guidance

The ROSS may be integrated into the dose assessment/technical radiation cadre to provide technical expertise and support in a variety of ways. This could be through technical dose assessment and data analysis support, survey/sample planning, field team support, and data product interpretation and integration with existing situational awareness information. When working within the dose assessment/technical radiation cadre, a ROSS should:

- ❑ Introduce themselves; briefly explain their capabilities in radiation dose assessment and/or field response
- ❑ Offer to support data collection or analysis based on their strengths in areas such as technical dose assessment, field sampling objectives, or data management
- ❑ Provide objective and independent review of data and analysis
- ❑ Assist in interpretation and integration of technical information into plain language for use in situational awareness and recommendation development
- ❑ Offer to serve as liaison representing the technical cadre to other agencies/ESF's within the EOC to route questions and messages between the technical group and the responder groups
- ❑ Offer to coordinate between the various technical groups from federal agencies and other state/local jurisdictions from inside and outside the state to facilitate information sharing and a common operational picture
- ❑ Offer to use or interpret the results from tools and resources such as those found in the ROSS Toolkit, RadResponder, CMWeb, IMAAC, and from the A-Team to assist in situational awareness, data management, and recommendation development, as appropriate

Note on Dose Assessment/Technical Radiation Cadre

The ROSS should aim to coordinate closely with any technical radiation group established for the incident. This group could be located within the EOC where the ROSS is assigned but could also be operating from another location and providing technical assessment and guidance remotely.

EOC Organization

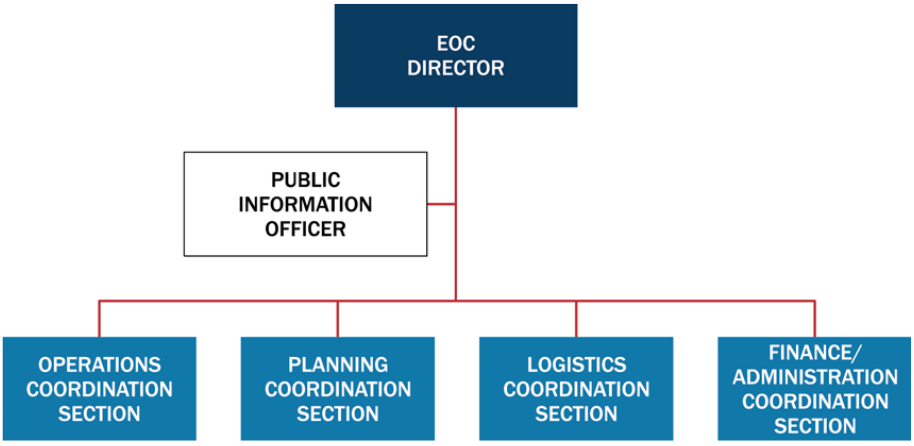
EOC organizational structure will vary widely and depend on factors such as the authority of a jurisdiction/organization, staffing, partner and stakeholder agencies' representatives, physical facility, communications capabilities, political considerations, and most importantly, the mission.

There are three common ways to organize an EOC as identified in NIMS:

- ICS or ICS-like Structure: A variation on an ICS organizational structure with varying nuances and possible title changes to emphasize the coordination and support mission of EOCs
- ISM Structure: A variation of the ICS structure that separates the information management/situational awareness function from the ICS Planning Section and combines the functions of the ICS Operations and Logistics Sections
- Departmental Structure: An organizational structure based on day-to-day departmental/agency structure and relationships in the jurisdiction

ICS or ICS-like Structure

Many jurisdictions/organizations configure their EOCs using the standard ICS organizational structure. This structure is familiar to many people, and it aligns with the on-scene incident organization. Some jurisdictions/organizations use the standard ICS organizational structure but modify certain titles to create an ICS-like organization that distinguishes EOC functions from their field counterparts.



When using this type of EOC organization, field personnel at the ICP and EOC personnel performing the same function (e.g., Operations Section Chief) should agree on how to divide their responsibilities to avoid gaps and/or duplication of effort.

An ICS-like EOC structure generally reflects the standard ICS organization but with varying nuances and possible title changes to emphasize the coordination and support mission of EOCs, as opposed to the tactical and logistics management role of on-scene responders. For example, EOC leaders often opt to adjust titles to differentiate between field and EOC functions/personnel by adding "Support" or "Coordination" to section titles.

In an EOC organized in an ICS or ICS-like Structure, the ROSS is most likely to interface with the:

- EOC Management Staff
- Operations Coordination Section
- Planning Coordination Section

EOC Management Staff

The EOC Management Staff includes an EOC Director who guides and oversees EOC staff and activities. The EOC Command Staff typically includes a PIO and may include others such as a Legal Advisor and a Safety Officer. The EOC Director sets EOC objectives and tasks, integrates stakeholders, works with senior officials to facilitate the development of policy direction for incident support, and ensures the dissemination of timely, accurate, and accessible information to the public.

Potential ROSS Support to EOC Management Staff

- ❑ Advise on the current and potential environmental impacts of radioactive material released to the environment and/or future releases
- ❑ Advise on the potential dose impacts to emergency workers and the public, and compare the assessments to the respective EPA Protective Action Guidance
- ❑ Advise on impacts to agriculture and potable water
- ❑ Present FRMAC and NARAC data products and solicit feedback for new data products to assist decision-makers
- ❑ Advise the PIO on the content of messaging to emergency workers and the public

Operations Coordination Section

Operations Coordination Section staff help ensure that on-scene incident personnel have the resources and operational support necessary to achieve incident objectives and address leadership priorities. The staff in this section are often organized functionally—by ESF or Recovery Support Function (RSF), for example—and are the primary points of contact for on-scene response personnel within their respective functions. They coordinate closely with incident personnel to identify and address unmet resource needs.

Potential ROSS Support to the Operations Coordination Section

- ❑ Advise on the resources and equipment needs for the response (e.g. dosimetry, PPE, population monitoring)
- ❑ Advise on radiological response strategies
- ❑ Advise on decontamination equipment and strategies
- ❑ Advise on optimization and distribution of limited resources of instrumentation and materiel for radiological support until outside resources fully equip the response

Planning Coordination Section

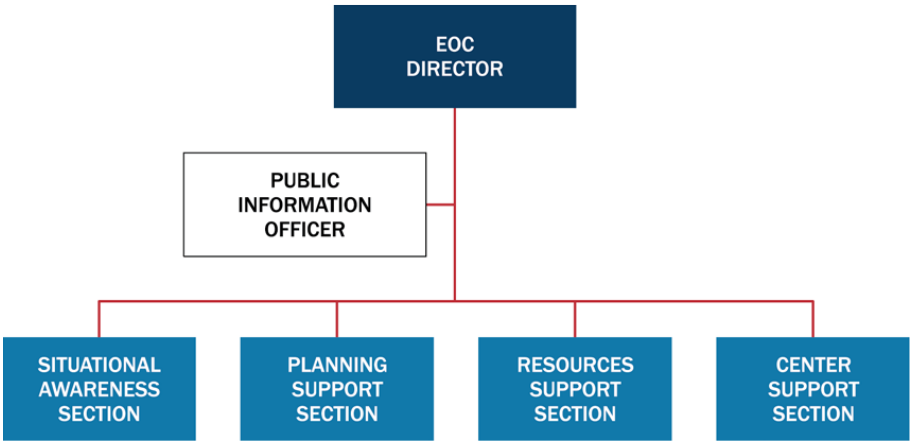
The Planning Coordination Section has two primary functions: managing situational awareness efforts and developing incident-specific plans. Staff in this section work closely with personnel in the ICS Planning Section to collect, analyze, and disseminate incident and incident-related information, including integrating geospatial and technical information and developing reports, briefings, and presentation products for a variety of stakeholders, including leadership, EOC personnel, and other internal and external stakeholders. Planning Coordination Section personnel also facilitate a standard planning process to achieve the EOC objectives and provide a range of current and future planning services to address current needs and anticipate and devise the means to deal with future needs.

Potential ROSS Support to the Planning Coordination Section

- ❑ Recommend radiological safety attributes for the IAP
  - Exposure and exposure rate decision points by task
  - In the context of austere resources, recommend dosimetry tactics
- ❑ Assess shortfalls for monitoring, dosimetry, and decontamination, and recommend requests for additional resources
- ❑ Advise the Resources Unit on resource capabilities
- ❑ Contribute technical expertise to the Situation Unit to interpret and explain technical products and maps, as well as reports from field teams
- ❑ Deliver briefings on the radiological hazards
- ❑ Serve as a conduit to reach-back support via the FRMAC Liaison

ISM Structure

Jurisdictions/organizations that focus their EOC efforts on information, planning, and resource support may choose to separate the situational awareness function from planning and combine operations and logistics functions into an incident support structure. This organization puts the EOC Director in direct contact with those doing situational awareness/information management and streamlines resource sourcing, ordering, and tracking.



The ISM structure is a variation of the ICS structure that separates the information management/situational awareness function from the ICS Planning Section and combines the functions of the ICS Operations and Logistics Sections and comptroller/purchasing functions from the ICS Administration/Finance Section.

As with the ICS/ICS-like model, the director of an ISM EOC is supported by personnel designated to key functions, subject matter experts, and technical specialists. Staff supporting the EOC Director typically include a PIO and may include others such as a Legal Advisor. The General Staff sections consist of Situational Awareness, Planning Support, Resources Support, and Center Support.

In an EOC organized in an ISM Structure, the ROSS is most likely to interface with the:

- ISM EOC Director's Staff
- Situational Awareness Section
- Planning Support Section
- Resources Support Section

The following checklist represents potential ROSS support that could apply to all functional areas of the EOC under this model.

Common ROSS Support to an ISM Structured EOC

- ❑ Advise on the current and potential environmental impacts of radioactive material released to the environment and/or future releases
- ❑ Advice of the potential dose impacts to emergency workers and the public, and compare the assessments to the respective EPA Protective Action Guidance
- ❑ Advise on impacts to agriculture and potable water
- ❑ Present FRMAC and IMAAC/NARAC data products and solicit feedback for new data products to assist decision-makers

ISM EOC Director's Staff

As with the ICS/ICS-like EOC Command Staff, the ISM EOC Director's staff typically includes a PIO and may include others such as a Legal Advisor and a Safety Officer. The EOC Director and director's staff set EOC tasks, work with senior officials to facilitate the development of policy direction for incident support, and ensure the dissemination of timely, accurate, and accessible information to the public.

Potential ROSS Support to the EOC Director's Staff

- ❑ Review the checklist Common ROSS Support to an ISM Structured EOC
- ❑ Advise the PIO on the content of messaging to emergency workers and the public

Situational Awareness Section

Situational Awareness staff collect, analyze, and disseminate incident information. This section's personnel typically create and provide a variety of products for EOC policy-level leadership, public affairs, and other internal and external stakeholders. The Situational Awareness Section essentially elevates the functions of the ICS Planning Section Situation Unit to a General Staff position in the EOC, reporting directly to the EOC Director. The staff in this section also process requests for information; develop reports, briefings, and presentation products; integrate geospatial and technical information; and develop material to support public warning messages.

Potential ROSS Support to the Situational Awareness Section

- ❑ Review the checklist Common ROSS Support to an ISM Structured EOC
- ❑ Identify relevant EEIs to inform and maintain the radiological situational awareness and common operating picture

Planning Support Section

The Planning Support Section staff provide a range of current and future planning services that may include developing contingency, deactivation, and recovery plans. Staff in the Planning Support Section assist in developing and executing the shared goals of multiple jurisdictions and organizations involved in managing the incident and coordinate a standard planning process to achieve the objectives of the EOC leadership and foster unity of effort among all organizations represented in the center. The Planning Support Section staff coordinate closely with the ICS Planning Section to ensure that both on-scene and EOC personnel have appropriate contingency plans in place.

Potential ROSS Support to the Planning Support Section

- ❑ Review the checklist Common ROSS Support to an ISM Structured EOC
- ❑ Assess shortfalls for monitoring, dosimetry, and decontamination, and recommend requests for additional resources
- ❑ Recommend radiological safety attributes for the IAP:
  - Exposure and exposure rate decision points by task
  - In the context of austere resources, recommend dosimetry tactics

Resources Support Section

Staff in the Resources Support Section work to ensure that on-scene incident management personnel have the resources and operational support they need. Resource Support Section staff source, request/order, and track all resources. This includes supplies, equipment, and personnel acquired from departments and agencies represented in the EOC, other community organizations, mutual aid/EMAC sources, or NGOs, as well as items purchased or leased. Staff in the Resources Support Section may be organized by department/agency or by ESF/RSF.

Potential ROSS Support to the Resources Support Section

- ❑ Advise on the equipment needs for the response (e.g., dosimetry, personnel, protective equipment, population monitoring)
- ❑ Advice on decontamination equipment and strategies
- ❑ Advice on optimization and distribution of limited resources of instrumentation and materiel for radiological support until outside resources fully equip the response

Departmental Structure

Jurisdictions/organizations may opt instead to use their day-to-day departmental/agency structure and relationships in their EOC. By operating in the context of their normal relationships, department/agency representatives can function in the EOC with minimal preparation or startup time. In this configuration, the organization's emergency manager or a senior official typically coordinates EOC efforts among the departments and agencies. This model can also be organized using ESFs instead of departments.

In this example, the Emergency Manager, as EOC Director, directly facilitates EOC planning and reporting. For the departments, representatives bring the various resources, expertise, and relationships that are associated with those organizations and functions. Decisions are made within the group to achieve mutually agreed upon objectives. The roles and responsibilities of a departmental EOC reflect the day-to-day responsibilities of the represented departments and agencies.

Potential ROSS Support

Under this model, the ROSS may end up working directly with one or more government agencies in the EOCs jurisdiction. These agencies could include, but are not limited to:

- Health Department
- Environmental Department
- Fire Department (HAZMAT)

Specific support requirements and interactions will vary depending on the capabilities of the individual agencies, the internal organization of the agencies, and the relationships between the agencies and their local interagency counterparts.

Emergency Support Functions

ESFs are a coordinating mechanism for building, sustaining, and delivering response core capabilities. This section will describe the ESFs in the context of the federal ESF structure, recognizing that this may vary across state and local jurisdictions, but is usually derived from the federal structure. Note that the original ESF 14 is superseded by the National Disaster Recovery Framework.; as of 2018, FEMA has designated ESF 14 for Private Sector coordination.

- ESF 1 - Transportation
- ESF 2 - Communications
- ESF 3 – Public Works and Engineering
- ESF 4 – Firefighting
- ESF 5 – Information and Planning
- ESF 6 – Mass Care, Emergency Assistance, Temporary Housing, and Human Services
- ESF 7 – Logistics
- ESF 8 – Public Health and Medical Services
- ESF 9 – Search and Rescue
- ESF 10 – Oil and Hazardous Materials Response
- ESF 11 – Agriculture and Natural Resources
- ESF 12 – Energy
- ESF 13 – Public Safety and Security
- ESF 14 – Private Sector
- ESF 15 – External Affairs

ESF 1 - Transportation

Description

Coordinates the management of transportation systems and infrastructure, the regulation of transportation, management of airspace, and ensuring the safety and security of the transportation system. Functions include but are not limited to:

- Transportation modes management and control
- Transportation safety
- Stabilization and reestablishment of transportation infrastructure
- Movement restrictions
- Aviation/airspace management and control
- Damage and impact assessment

Nuclear/Radiological Incident Considerations

- Damaged or contaminated transportation infrastructure
- Decontamination of critical resources
- Contaminated debris blocking transportation arteries
- Rapidly cascading effects
- Impacts to transport, shipping, logistics, supply chains, and resource movement
- Large scale evacuations via transportation infrastructure
- Strategies to limit spread of contamination

ROSS Guidance

The ROSS can assist ESF 1 with:

- ❑ Recommending the closing/opening of transportation nodes (e.g., highways, railroads, airports, airspace, etc.) base on the radiological hazard
- ❑ Identifying alternative transportation nodes/routes to avoid radiological hazard
- ❑ Determining effective means to survey transportation infrastructure for radiological contamination (i.e., Aerial Measuring System (AMS) overflight of a highway, mobile detection equipment on a train)
- ❑ Recommending contamination control and decontamination methods for transportation infrastructure
- ❑ Evacuation planning

ESF 2 - Communications

Description

Coordinates the reestablishment of the critical communications infrastructure, facilitates the stabilization of systems and applications from cyber-attacks, and coordinates communications support to response efforts. Functions include but are not limited to:

- Coordination with telecommunications and information technology industries
- Reestablishment and repair of telecommunications infrastructure
- Protection, reestablishment, and sustainment of cyber and information technology resources
- Oversight of communications within applicable response structures

Nuclear/Radiological Incident Considerations

- Damaged or contaminated communications infrastructure
- Decontamination of critical resources
- Effects of EMP
- Power outages impacting communications technology and infrastructure

ROSS Guidance

The ROSS can assist ESF 2 with:

- ❑ Identifying methods to minimize contamination of critical communications equipment
- ❑ Determining effective means to survey communications infrastructure for radiological contamination (i.e., AMS overflights, field team surveys)
- ❑ Explaining the potential effects of electromagnetic pulse (EMP) and impacts to communications infrastructure

ESF 3 – Public Works and Engineering

Description

Coordinates the capabilities and resources to facilitate the delivery of services, technical assistance, engineering expertise, construction management, and other support to prepare for, respond to, and/or recover from a disaster or an incident. Functions include but are not limited to:

- Infrastructure protection and emergency repair
- Critical infrastructure reestablishment
- Engineering services and construction management
- Emergency contracting support for lifesaving and life-sustaining services

Nuclear/Radiological Incident Considerations

- Damaged or contaminated transportation infrastructure
- Decontamination of critical resources
- Contaminated and non-contaminated debris and obstacles
- Debris removal radiological health and safety concerns

ROSS Guidance

The ROSS can assist ESF 3 with:

- ❑ Determining effective means to minimize contamination and spread of contamination on public works infrastructure and critical facilities
- ❑ Determining effective means to survey public works infrastructure and critical facilities for radiological contamination (i.e., AMS overflights, field team surveys)
- ❑ Supporting restoration of water infrastructure systems, including drinking water
- ❑ Identifying safe locations to construct temporary critical public facilities
- ❑ Determining ways to continually monitor and survey temporary critical facilities for potential radiological contamination
- ❑ Advising on safe and effective means to clear contaminated debris
- ❑ Advising on safe and effective means to sort contaminated debris and recover contaminated human remains

ESF 4 – Firefighting

Description

Coordinates the support for the detection and suppression of fires. Functions include but are not limited to:

- Support to wildland, rural, and urban firefighting operations

In some state and local jurisdictions, because Emergency Medical Services (EMS) reside with the fire department, EMS capabilities, such as supporting pre-hospital care and ambulance services, may be grouped with ESF 4 as opposed to ESF 8.

Nuclear/Radiological Incident Considerations

- Mass conflagration (large destructive fire)
- Water supply
- Firefighter health and safety
- PPE and dosimetry
- Competing demands for resources (firefighting vs. search and rescue, HAZMAT, or emergency medical/pre-hospital care)
- Decontamination

In some EOCs, especially at the local level, radiological response capabilities may be grouped with the fire department under ESF 4. The HAZMAT response capabilities may also be split between ESF 4 and ESF 10.

ROSS Guidance

The ROSS can assist ESF 4 with:

- ❑ Establishing health and safety protocols for ESF 4 responders (e.g., PPE, exposure, dose, stay time, decontamination, etc.)
- ❑ Effective mission planning based on radiological deposition and contamination

ESF 5 – Information and Planning

Description

Supports and facilitates multiagency planning and coordination for operations involving incidents requiring federal coordination. Functions include but are not limited to:

- Incident action planning
- Information collection, analysis, and dissemination

Nuclear/Radiological Incident Considerations

- Integration of scientific and technical information and responders
- Information management
- Critical resource management and allocation

ROSS Guidance

The ROSS can assist ESF 5 with:

- ❑ Integrating scientific and technical information, as well as scientific and technical responders
- ❑ Radiological expertise to various planning efforts (incident action planning, incident coordination/support planning, contingency planning, strategic planning, long-range planning, etc.).
- ❑ Encouraging use of tools to promote a common operating picture
- ❑ Contributing radiological information to the overall situational awareness
- ❑ Providing relevant radiological information for decision-making
- ❑ Incorporating relevant radiological information into situation reports, geospatial data, displays, briefings, and other decision support tools
- ❑ Critical radiological response resource management and allocation

Notes

ESF 5 may be a significant consumer of radiological data and information to support overall situational awareness, common operating picture, and planning. The ROSS may be required to interact with ESF 5 and explain radiological data and information, including maps and technical products.

If GIS is located here, interactions with FRMAC data products and a RadResponder display will be a common source of engagement. Local- and state-specific GIS data layers are very important to incorporate with each, especially to enable the ROSS and others to see where critical infrastructure exists relative to the radiological impacts.

ESF 6 – Mass Care, Emergency Assistance, Temporary Housing, and Human Services

Description

Coordinates the delivery of mass care and emergency assistance, including:

- Mass care, including for vulnerable populations (i.e., schools, child care, elderly)
- Emergency assistance, including responder support services
- Disaster housing

Nuclear/Radiological Incident Considerations

- Evacuation and shelter-in-place
- Population monitoring and decontamination
- Intermediate term-housing and relocation

ROSS Guidance

The ROSS can assist ESF 6 with:

- ❑ Identifying safe locations for CRCs and evacuation shelters
- ❑ Advising on safe re-entry to evacuated areas
- ❑ Providing guidance to populations sheltered-in-place
- ❑ Advising on radiological monitoring and decontamination for household pets and service animals
- ❑ Identifying and communicating requirements for life-saving and life-sustaining needs for disaster survivors facing radiological health and safety issues

Notes

In coordination with ESF 8, ESF 6 may be involved in establishing evacuation shelters and CRCs for population monitoring. The ROSS may need to advise on the location of these centers and the resources required to support them.

ESF 7 – Logistics

Description

Coordinates comprehensive incident resource planning, management, and sustainment capability to meet the needs of disaster survivors and responders. Functions include but are not limited to:

- Comprehensive, incident logistics planning, management, and sustainment capability
- Resource support (e.g., facility space, office equipment and supplies, contracting services)

Nuclear/Radiological Incident Considerations

- Damaged and disrupted supply chains
- Temporary facilities
- Safe locations for incident response facilities:
  - ICPs
  - Mobilization centers
  - Staging areas
  - Base of operations
- Contamination control at incident facilities
- Logistics support to facilities
- Decontamination of critical resources
- Identification of appropriate radiological monitoring equipment

ROSS Guidance

The ROSS can assist ESF 7 with:

- ❑ Identifying logistical requirements for radiological response operations and assets
- ❑ Identifying means to acquire limited radiological response resources, equipment, and supplies
- ❑ Ensuring incident facilities are established in safe areas
- ❑ Advising on contamination control measures at incident facilities

Notes

For incidents of national significance, numerous technical/radiological response resources will respond, each with work space requirements (square footage) and other logistical needs. The ROSS can help logistics staff recognize the immensity of the implications. Radiological incidents may result in the need for large quantities of technically-specific resources, including dosimeters, survey meters, and PPE. Over time, maintenance of these and other devices will become a logistics issue, too. Some, especially PPE, will be in demand for multiple hazards, so coordination with chemical and biological hazard subject matter experts is important.

ESF 8 – Public Health and Medical Services

Description

Coordinates the mechanisms for assistance in response to an actual or potential public health and medical disaster or incident. Functions include but are not limited to:

- Public health
- Medical surge support including patient movement
- Behavioral health services
- Medical counter measures
- Mass fatality management
- Radiation and contamination injuries

Nuclear/Radiological Incident Considerations

- Radiological public health concerns
- Mass casualty
- Radiation related injuries
- Damage to health care facilities
- Medical transport
- Field hospitals
- Fatality management
- Contaminated bodies
- Crisis standards of care
- Dosimetry programs
- Epidemiologists for dose tracking
- Medical facility contamination control

ROSS Guidance

Given that radiation exposure and contamination present public health concerns, there is expected to be considerable interaction between the ROSS and ESF 8. The ROSS may find themselves directly supporting ESF 8 or serving as an ESF 8 Liaison to other functional areas.

The ROSS can assist ESF 8 with:

- ❑ Coordinating public health communications and messaging with regards to the radiological hazard
- ❑ Assessing radiological information and data as it relates to public health concerns
- ❑ Mass triage of patients who may have received an acute dose and planning for operations to maximize survivability
- ❑ Assist mental and behavioral health professionals with managing psychological care
- ❑ Providing radiological health and safety guidance for responders and public
- ❑ Advising on hazard mitigation related to contaminated human remains
- ❑ Guidance for contaminated fatality management
- ❑ Assisting with public health and radiological support planning for CRCs
- ❑ Advising on the safety of the food and water supply with regards to radiological contamination
- ❑ Advising on strategies to limit the spread of radiological contamination, to prevent further exacerbating the public health problem
- ❑ Assessing the need for radiological medical countermeasures
- ❑ Recommending specialized response assets equipped to support radiation injuries, contaminated injuries, and other radiological medical issues
- ❑ Combined chemical and infectious agent injuries with radiological contamination
- ❑ Laboratory radiochemical analysis sample coordination

Notes

Radiological response capabilities associated with public health entities can be organized under ESF 8 in many EOCs. These entities, especially the Radiation Control Program, may possess resources like trained people and a broad range of instruments and dosimetry critical to the response. Some also have radiochemistry capabilities and technical field teams.

The ROSS may assist with determining whether medical counter measures like granulocyte colony stimulating factor, ethylenediaminetetraacetic acid (EDTA), Prussian blue, and potassium iodide should be administered.

The ROSS may be able to facilitate connections with specialized health and medical resources such as the U.S. Department of Health and Human Services (DHHS), CDC, U.S. Food and Drug Administration (FDA), U.S. Department of Energy (DOE)/National Nuclear Security Administration (NNSA), REAC-TS, and other resources as available.

ESF 9 – Search and Rescue

Description

Coordinates the rapid deployment of search and rescue resources to provide specialized lifesaving assistance. Functions include but are not limited to:

- Structural collapse/urban search and rescue (USAR)
- Maritime/Coastal/Waterborne search and rescue
- Land search and rescue

Nuclear/Radiological Incident Considerations

- Responder health & safety considerations
- PPE and dosimetry
- Go/No go zones
- Prioritization of effort
- Debris
- Decontamination
- Contaminated patients and radiological injuries
- Contaminated bodies
- Search animal radiological protection

ROSS Guidance

The ROSS can assist ESF 9 with:

- ❑ Effective mission planning based on radiological deposition and contamination and expected survivors; this is especially critical following a nuclear detonation when search and rescue operations will have to be prioritized based on victim survivability and responder safety (damage zones and fallout)
- ❑ Optimizing and managing limited USAR resources with integrated dose limitation
- ❑ Advising on dose management and contamination control for search and rescue animals
- ❑ Guidance for addressing contaminated victims and radiological injuries
- ❑ Advising on hazard mitigation related to contaminated human remains
- ❑ Guidance for contaminated fatality management
- ❑ Establishing health and safety protocols for ESF 9 responders (e.g., PPE, exposure, dose, stay time, decontamination, etc.)

Notes

ESF 9 may look to the ROSS for guidance on planning for search and rescue operations, specifically advising on areas that should be a priority for search and rescue operations based on the radiological hazards as well as guidance on dosimetry, PPE, and decontamination for search and rescue workers.

A key ROSS function in a nuclear detonation is helping USAR teams focus on the moderate damage zone where the most lives can be saved. The ROSS can also help with planning entries to take advantage of fallout decay over time in the dangerous fallout zone.

For a nuclear detonation, it may be useful to describe the search and rescue by zones:

- Dangerous Fallout Zone - should be avoided for responder safety, survivors in this area should shelter in place
- Severe Damage Zone - Survivors are unlikely and responders could be seriously exposed or injured by conducting operations here
- Moderate Damage Zone - Survival is possible and the response will focus search and rescue operations here
- Light Damage Zone - Relative to the other zones, people will be uninjured and are likely able to self-evacuate after sheltering

ESF 10 – Oil and Hazardous Materials Response

Description

Coordinates support in response to an actual or potential discharge and/or release of oil or hazardous materials. Functions include but are not limited to:

- Environmental assessment of the nature and extent of oil and hazardous materials contamination
- Environmental decontamination and cleanup

Nuclear/Radiological Incident Considerations

- Radiological field monitoring and data collection
- Radiological common operating picture
- Decontamination and clean-up
- Other hazardous materials

ROSS Guidance

The ROSS can assist ESF 10 with:

- ❑ Characterizing the extent of the radiological hazard
- ❑ Advising on the selection and use of appropriate radiological monitoring instrumentation and equipment
- ❑ Advising on actions to prevent, minimize, or mitigate the release
- ❑ Advising on efforts to detect and assess the extent of environmental contamination
- ❑ Determining actions to stabilize the release and prevent the spread of contamination
- ❑ Analyzing options for decontamination and environmental cleanup
- ❑ Developing solutions for the storage and disposal of radiologically contaminated waste and debris
- ❑ Establishing health and safety protocols for ESF 10 responders (e.g., PPE, exposure, dose, stay time, decontamination, etc.)
- ❑ Advising on safe and effective means to clear contaminated debris
- ❑ Identifying safe routes of entry to the incident area
- ❑ Providing technical expertise to support the preparation of public messages and communications
- ❑ Environmental data management processes
- ❑ Laboratory analysis sample coordination
- ❑ Mixed, chemical, biological, and radiological hazards

Notes

Radiological response capabilities associated with traditional HAZMAT response functions can be grouped under ESF 10, especially when the primary state or local agency is an environmental department. Fire Department HAZMAT resources may be located under ESF 10 or ESF 4.

The ROSS should recognize that in some locations, non-radiological HAZMAT may be the priority risk to be managed, or compound existing radiological risks (i.e., chemical hazard coupled with a radiological hazard).

ESF 11 – Agriculture and Natural Resources

Description

Coordinates a variety of functions designed to protect the nation's food supply, respond to plant and animal pest and disease outbreaks, and protect natural and cultural resources. Functions include but are not limited to:

- Nutrition assistance
- Animal and agricultural health issue response
- Technical expertise, coordination, and support of animal and agricultural emergency management
- Meat, poultry, and processed egg products safety and defense
- Natural and cultural resources and historic properties protection

Nuclear/Radiological Incident Considerations

- Food supply shortages
- Extensive sampling and lab analysis
- Food and agriculture embargoes
- Livestock embargoes
- Potable water restrictions

ROSS Guidance

The ROSS can assist ESF 11 with:

- ❑ Assessing potential impact to animals, livestock, agriculture, water, and food supply
- ❑ Reentry to care for animals, evacuation of animals, and euthanasia of over-exposed animals
- ❑ Assessing and planning for ingestion pathway issues
- ❑ Sampling strategies to confirm safety of food and agriculture
- ❑ Laboratory analysis sample coordination

Notes

ESF 11, which often includes food- and agriculture-related agencies, may play a significant role in food safety, water supply, and ingestion pathway issues. The ROSS may need to provide guidance on radiological impacts to food and water, agriculture, and ingestion pathway. This may include interpreting radiological data and information, including maps and technical products, and advising on food, water, and agriculture monitoring and sampling strategies.

This will be the driving force of recovery, where the highest expenditure of resources of all kinds may be expected. For an RDD the spread of contamination having an impact on the ingestion pathway could be over many jurisdictions. For a nuclear detonation it could be spread over many states. For jurisdictions near international borders, plans must include Canada or Mexico.

Some ROSS may have strong working relationships with EPA radiological emergency response and recovery resources. They are all well connected to other EPA environmental resources.

ESF 12 – Energy

Description

Facilitates the reestablishment of damaged energy systems and components and provides technical expertise during an incident involving radiological/nuclear materials. Functions include but are not limited to:

- Energy infrastructure assessment, repair, and reestablishment
- Energy industry utilities coordination
- Energy forecast

Nuclear/Radiological Incident Considerations

- Damaged or contaminated infrastructure.
- Decontamination of critical resources.
- Unknown effects of EMP
- Overloaded networks
- Fuel shortages
- Cascading effects of energy outages

ROSS Guidance

The ROSS can assist ESF 12 with:

- ❑ Determining effective means to survey energy infrastructure for radiological contamination
- ❑ Explaining the potential effects of EMP and impacts to energy infrastructure

Notes

While named "Energy" and at the federal level coordinated by the DOE, ESF 12 manages energy infrastructure. Neither the DOE's radiological response, nor its assets, are coordinated by ESF 12.

As with other ESFs that help restore critical infrastructure, the ROSS can assist here with radiological aspects of planning for entries to support such restoration.

ESF 13 – Public Safety and Security

Description

Coordinates the integration of public safety and security capabilities and resources to support the full range of incident management activities. Functions include but are not limited to:

- Facility and resource security
- Security planning and technical resource assistance
- Public safety and security support
- Support to access, traffic, and crowd control

Nuclear/Radiological Incident Considerations

- Investigation (criminal or terrorism nexus)
- General law enforcement actions in hazardous environment
- PPE and dosimetry

ROSS Guidance

The ROSS can assist ESF 13 with:

- ❑ Establishing health and safety protocols for ESF 13 responders (e.g., PPE, exposure, dose, stay time, decontamination, control zones etc.)
- ❑ Effective mission planning based on radiological deposition and contamination
- ❑ Assist with dose and contamination control tactics

Notes

Almost any nuclear or radiological incident will have strong law enforcement equities, including investigations. The ROSS is not typically requested to provide direct support to law enforcement investigations, but may be asked to advise on radiological hazards law enforcement personnel may encounter as well as guidance on dosimetry, PPE, and decontamination for law enforcement.

ESF 14 – Private Sector

As of September 2018, FEMA is developing materials for this ESF. In future iterations of this job aid, nuclear/radiological considerations and ROSS guidance will be added.

ESF 15 – External Affairs

Description

Coordinates the release of accurate, coordinated, timely, and accessible public information to affected audiences, including the government, media, NGOs, and the private sector. Works closely with state and local officials to ensure outreach to the whole community. Functions include, but are not limited to:

- Public affairs and the JIC
- Intergovernmental (local, state, tribal, and territorial) affairs
- Congressional affairs
- Private sector outreach
- Community relations

Nuclear/Radiological Incident Considerations

- Timely, accurate, and understandable public information is critical to saving lives
- Limited or damaged communications pathways
- Following rumors and the news and social media for content that requires correction
- Radiation myths and misunderstandings
- Potential for deliberate misinformation

ROSS Guidance

The ROSS can assist ESF 15 with:

- ❑ Monitoring public reporting (through traditional and social media) and validate the accuracy of the technical and radiological information; identify and report misinformation
- ❑ Confirming what official public messages have been released
- ❑ Identifying necessary information to communicate with the public
- ❑ Working with public information officials to develop public messages that address radiological health and safety issues in clear, concise, and easy-to-understand language
- ❑ Periodically re-evaluating the public messaging as it relates to the nuclear or radiological hazard and work with public information officials to update public messages
- ❑ Following rumors and news and social media for technical content and radiological information that needs correction

Notes

Communicating guidance to the public in the aftermath of nuclear or radiological incident is paramount for public health and safety. This messaging will be coordinated by ESF 15 and will require technical input on the radiological health hazard, and the most effective ways to communicate technical information to the general public. It may be useful to dedicate a ROSS to the JIC or ESF 15 for the most complex incidents.

MAC Group

MAC Groups, sometimes called policy groups, are part of the incident management structure of NIMS. MAC Groups consist of representatives from stakeholder agencies or organizations. They are established and organized to make cooperative multiagency decisions. MAC Groups act as policy-level bodies during incidents, supporting resource prioritization and allocation, and enabling decision-making among elected and appointed officials and those responsible for managing the incident (e.g., the Incident Commander). In some instances, EOC staff also carry out this activity.

MAC Groups typically consist of agency administrators and executives, or their designees. Organizations at any level (e.g., local, state, tribal, or federal) or within any discipline (e.g., emergency management, public health, critical infrastructure, or private sector) may establish a MAC Group. In some jurisdictions, local law or policy may require a MAC Group to authorize additional resources and/or provide guidance to EOC staff and/or incident command.

MAC Groups are primarily responsible for resource prioritization and allocation. Unlike Unified Command, they do not perform Incident Command functions, nor do they replace the primary functions of operations, coordination, or dispatch organizations (e.g., 911 dispatch centers, etc.). When competition for resources is significant, MAC Groups may relieve the coordination and dispatch organizations of some prioritization and allocation responsibilities.

The composition of MAC Groups is important. Sometimes membership is obvious. Organizations directly affected and whose resources are committed to the incident should be represented. Sometimes, however, organizations that should be MAC Group members are less obvious. These include business organizations such as local chambers of commerce, volunteer organizations active in disasters (VOADs), or other organizations with special expertise or knowledge. While these organizations may not have tangible resources or funds to contribute, their relationships, political influence, or technical expertise can be key to the MAC Group's success in supporting incident response and recovery. MAC Group designees should have their respective organization's authorization to represent or commit agency resources and funds for incident activities. MAC Groups typically base their decisions on member consensus. In many cases, a MAC Group can function virtually.

Elected and appointed officials are key players in incident management. They are responsible for the safety and welfare of their constituents and the overall effectiveness of incident management efforts. Governors, tribal leaders, mayors, city managers, and county commissioners, for example, typically comprise the policy level of incident management and provide guidance regarding priorities and strategies for dealing with incident response and recovery. Incident personnel working in EOCs and on scene share the responsibility for keeping elected and appointed officials informed of incident specifics, resource needs, and other pertinent information. Effective communication between these incident personnel and policy-level officials fosters trust and helps ensure that all leaders have the information they need to make informed decisions. MAC Groups provide a way to organize policy-level officials to enhance unity of effort at this senior level.

ROSS MAC Group Support

Should a ROSS find themselves supporting a MAC Group, refer to the previous EOC guidance on:

- Policy Resolution (Page 18)
- Key Decisions (Page 20)
- Interface with Senior Executives and Elected/Appointed Officials (Page 21)

Glossary

Aerial Measuring System (AMS): Airborne radiation detection systems that measure air and ground contamination (https://www.energy.gov/nnsa/aerial-measuring-system-ams).

Common Operating Picture (COP): A capability for sharing dynamic, geospatially referenced situational awareness information. A COP provides timely, fused, accurate displays of data, shared across the enterprise, which facilitates collaborative planning and supports situational awareness for all stakeholders. Data disseminated through a COP is drawn from authoritative data sources, allowing stakeholders to filter and contribute to the COP according to their area of responsibility, mode, or role.

Consequence Management Home Team (CMHT): The Consequence Management Home Team provides information, technical, and operational support by assembling and interpreting data for public safety and hazard mitigation during a radiological or nuclear incident.

Consequence Management Web (CMWeb): An account-based application to disseminate critical information to decision-makers during radiological/nuclear incidents.

Department Operations Center (DOC): An operations or coordination center dedicated to a single, specific department or agency. The focus of a DOC is on internal agency incident management and response. DOCs are often linked to and/or physically represented in a combined agency EOC by an authorized agent(s) for the department or agency.

Emergency Management Assistance Compact (EMAC): A congressionally ratified agreement that provides form and structure to interstate mutual aid. Through an EMAC, a disaster-affected state can request and receive assistance from other member states quickly and efficiently, resolving two key issues up front: liability and reimbursement.

Emergency Operations Center (EOC): The physical location where the coordination of information and resources to support incident management (on-scene operations) activities normally takes place. An EOC may be a temporary facility or located in a more central or permanently established facility, perhaps at a higher level of organization within a jurisdiction.

Emergency Support Function (ESF): The grouping of governmental and certain private sector capabilities into an organizational structure to provide capabilities and services most likely needed to manage domestic incidents.

Essential Elements of Information (EEI): Important and standard information items, which support timely and informed decisions.

Federal Radiological Monitoring Assessment Center (FRMAC): A U.S. Department of Energy (DOE)-managed interagency asset that is available on request to respond to nuclear/radiological incidents that provides environmental radiological monitoring, sampling, assessment, and product dissemination for nuclear/radiological incident response.

Geographic Information System (GIS): System to visualize geographic data.

Incident Action Plan (IAP): A written plan that defines the incident objectives and reflects the tactics necessary to manage an incident during an operational plan.

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.

Incident Support Model (ISM): A variation of the ICS structure that separates the information management/situational awareness function from the ICS Planning Section and combines the functions of the ICS Operations and Logistics Sections.

Information Management: The collection, organization, and control over the structure, processing, and delivery of information from one or more sources and distribution to one or more audiences who have a stake in that information.

Interagency Modeling and Atmospheric Assessment Center (IMAAC): Coordinates and disseminates federal atmospheric dispersion modeling and hazard prediction products (https://www.fema.gov/imaac).

Joint Field Office (JFO): The primary federal incident management field structure in a Stafford Act declaration. The JFO is a temporary federal facility that provides a central location for the coordination of federal assistance to an affected state.

Joint Information Center (JIC): A facility in which personnel coordinate incident-related public information activities. The JIC serves as the central point of contact for all news media. Public information officials from all participating agencies co-locate at, or virtually coordinate through, the JIC.

Joint Information System (JIS): A structure that integrates overarching incident information and public affairs into a cohesive organization designed to provide consistent, coordinated, accurate, accessible, timely, and complete information during crisis or incident operations.

Jurisdiction: Jurisdiction has two definitions depending on the context:

- ***A range or sphere of authority***. Public agencies have jurisdiction at an incident related to their legal responsibilities and authority. Jurisdictional authority at an incident can be political or geographical (e.g., local, state, tribal, territorial, and federal boundary lines) and/or functional (e.g., law enforcement, public health).
- ***A political subdivision*** (e.g., municipality, county, parish, state, federal) with the responsibility for ensuring public safety, health, and welfare within its legal authorities and geographic boundaries.

Local Government: Public entities responsible for the security and welfare of a designated area as established by law. A county, municipality, city, town, township, local public authority, school district, special district, intrastate district, council of governments (regardless of whether the council of governments is incorporated as a nonprofit corporation under state law), regional or interstate government entity, or agency or instrumentality of a local government; a tribe or authorized tribal entity, or in Alaska, a native village or Alaska Regional Native Corporation; a rural community, unincorporated town or village, or other public entity.

Multiagency Coordination (MAC) Group: A group, typically consisting of agency administrators or executives from organizations, or their designees, that provides policy guidance to incident personnel, supports resource prioritization and allocation, and enables decision-making among elected and appointed officials and senior executives in other organizations, as well as those directly responsible for incident management.

Multiagency Coordination System (MACS): An overarching term for the NIMS Command and Coordination systems: ICS, EOCs, MAC Group/policy groups, and JISs.

Mutual Aid Agreement or Assistance Agreement: A written or oral agreement between and among agencies/organizations and/or jurisdictions that provides a mechanism to quickly obtain assistance in the form of personnel, equipment, materials, and other associated services. The primary objective is to facilitate the rapid, short-term deployment of support prior to, during, and/or after an incident.

National Atmospheric Release Advisory Center (NARAC): Provides plume predictions to aid emergency preparedness and response efforts for atmospheric releases of nuclear, radiological, chemical, biological, and hazardous natural materials (https://narac.llnl.gov/).

Non-governmental Organizations (NGOs): In the context of this job aid, includes mostly non-profit organizations independent of government agencies that are active in disaster relief, response, and recovery.

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 National Preparedness System. NIMS provides a consistent foundation for dealing with all incidents, ranging from daily occurrences to incidents requiring a coordinated federal response.

Normal Operations/Steady State: The activation level that describes routine monitoring of jurisdictional situation (no event or incident anticipated).

Personal Protective Equipment (PPE): Equipment worn to minimize exposure to workplace injuries and illnesses.

Point of Contact (POC): In the context of this job aid, the POC is the person who has requested a ROSS, or an individual whom the ROSS has been told to report to when arriving at the EOC.

Public Information: Processes, procedures, and systems for communicating timely, accurate, and accessible information on an incident's cause, size, and current situation, resources committed, and other

matters of general interest to the public, responders, and additional stakeholders (both directly affected and indirectly affected).

Public Information Officer (PIO): An official position within the ICS that is responsible for ensuring information about the incident is shared with the public. Serves as liaison between the media and the operational response.

Radiation Emergency Assistance Center/Training Site (REAC-TS): Provides consultation, advice, and education on medical management of radiation incidents (https://orise.orau.gov/reacts/).

Radiological Dispersal Device (RDD): The combination of radioactive material and the means (whether active or passive) to disperse the material with malicious intent. Fissions reactions do not occur in the RDD or its dispersed material.

Radiological Operations Support Specialist (ROSS): A resource with radiological expertise and an understanding of ICS available to state and local responders, emergency managers, and decision-makers.

Recovery Support Function: Coordinating structure for six functional areas of recovery assistance following an emergency, including: Communication Planning and Capacity Building, Economic Recovery, Health and Social Services, Housing Recovery, Infrastructure Systems, and Natural and Cultural Resources.

Resource Management: Systems for identifying available resources at all jurisdictional levels to enable timely, efficient, and unimpeded access to resources needed to prepare for, respond to, or recover from an incident.

State: Used in this document to include any state 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.

Unity of Effort: A NIMS guiding principle that provides coordination through cooperation and common interests and does not interfere with federal department and agency supervisory, command, or statutory authorities.

Agency/Organization Acronyms

CDC	Centers for Disease Control and Prevention
DHHS	Department of Health and Human Services
DHS	Department of Homeland Security
DOE	Department of Energy
EPA	Environmental Protection Agency
FEMA	Federal Emergency Management Agency
FDA	Food and Drug Administration
NCRP	National Council for Radiation Protection and Measurements
NNSA	National Nuclear Security Administration
OSHA	Occupational Safety and Health Administration
DHS S&T	Department of Homeland Security Science and Technology Directorate

References

Throughout this job aid, there are hyperlinks to references and resources that can be used by a ROSS in preparation for, and during, the activation of an EOC. The following documents were part of the source materials that the authors of this job aid used in its development:

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