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FEDERAL RADIOLOGICAL MONITORING AND ASSESSMENT CENTER

FRMAC Operations Manual

December 2005

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DISCLAIMER

FEDERAL RADIOLOGICAL MONITORING AND ASSESSMENT CENTER

FRMAC Operations Manual

Colleen T. O'Laughlin, Program Manager
Consequence Management/Federal Radiological Monitoring and Assessment Center
U.S. Department of Energy, National Nuclear Security Administration
Nevada Site Office, Las Vegas, Nevada

Roger C. Thompson, IR Team Lead
Homeland Security and Defense Division
U.S. Department of Energy, National Nuclear Security Administration
Nevada Site Office, Las Vegas, Nevada

Deborah A. Wilber, Director
Office of Emergency Response
U.S. Department of Energy
National Nuclear Security Administration
Headquarters Office of Emergency Operations
Washington, D.C.

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Angela M. Anderson
Derivative Classifier
Bechtel Nevada

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PREFACE

In Homeland Security Presidential Directive (HSPD)-5, the President directed the development of a new National Response Plan (NRP) to align Federal coordination structures, capabilities, and resources into a unified, all-discipline, all-hazards approach to domestic incident management.

The NRP is built on the template of the National Incident Management System (NIMS), which provides a consistent doctrinal framework for incident management at all jurisdictional levels, regardless of the cause, size, or complexity of the incident. The activation of the NRP and its coordinating structures and protocols—either partially or fully—for specific Incidents of National Significance provides mechanisms for the coordination and implementation of a wide variety of incident management and emergency assistance activities. Included in these activities are Federal support to state, local, and tribal authorities; interaction with nongovernmental, private donor, and private-sector organizations; and the coordinated, direct exercise of Federal authorities, when appropriate.

The Nuclear / Radiological Incident Annex to the NRP addresses the response of Federal agencies to terrorist incidents involving nuclear or radioactive materials (Incidents of National Significance), and accidents or incidents involving such material that may or may not rise to the level of an Incident of National Significance.

In the event of a potential or existing major radiological incident, the U.S. Department of Energy's National Nuclear Security Administration Nevada Site Office (NNSA/NSO) has been charged with establishing and managing the Federal Radiological Monitoring and Assessment Center (FRMAC). The FRMAC provides coordinated federal assistance in the off-site areas to the impacted state(s) and the Coordinating Agency responsible for regulation and/or operation of the accident site.

This manual was written for those personnel who will be called upon to provide technical data, input, and decisions. Overall, this manual provides general guidance and some specific diagrams and forms. However, it is understood that site- and event- specific operational decisions and procedure parameters will need to be established and documented at the time of an emergency event. This manual is intended to provide enough guidance for stand-alone use without limiting FRMAC's ability to integrate the work with other partners or stakeholders. Note that the some of the titles of management positions within the FRMAC have been changed in order to comply with the structure of the Incident Command System (ICS) under NIMS.

The NNSA/NSO has the overall responsibility for maintaining the master copy of all FRMAC manuals. Please provide comments on this manual to:

U.S. Department of Energy
National Nuclear Security Administration
Nevada Site Office
Attn: FRMAC Program Manager
P.O. Box 98518
Las Vegas, Nevada 89193-8518

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ACRONYMS AND ABBREVIATIONS

AFB.....Air Force Base
ALARA.....As Low as Reasonably Achievable
AMS.....Aerial Measuring System
ARG.....Accident Response Group
CMO.....Consequence Management Official
CMHT.....Consequence Management Home Team
CMRT.....Consequence Management Response Team
DFO.....Disaster Field Office
DHS.....U.S. Department of Homeland Security
DOC.....U.S. Department of Commerce
DoD.....U.S. Department of Defense
DOE.....U.S. Department of Energy
DOE/HQ.....DOE Headquarters
DOI.....U.S. Department of Interior
DOJ.....U.S. Department of Justice
DOS.....U.S. Department of State
DOT.....U.S. Department of Transportation
ECN.....Emergency Communications Network
EDE.....Effective Dose Equivalent
EOC.....Emergency Operations Center
EPA.....U.S. Environmental Protection Agency
EPR.....Emergency Preparedness and Response
EPZ.....Environmental Protection Zone
ERDS.....Emergency Response Database System
FCO.....Federal Coordinating Officer
FDA.....U.S. Food and Drug Administration
FEMA.....Federal Emergency Management Agency
FRERP.....Federal Radiological Emergency Response Plan
FRMAC.....Federal Radiological Monitoring and Assessment Center

FRMAP .....Federal Radiological Monitoring and Assessment Plan
FRPCC .....Federal Radiological Preparedness Coordinating Committee
FRP .....Federal Response Plan
GIS .....Geographic Information System
GPS .....Global Positioning System
GSA.....General Services Administration
HHS.....U.S. Department of Health and Human Services
HPGe.....high-purity Germanium
HUD.....U.S. Department of Housing and Urban Development
IATA.....International Air Transport Association
INS .....Incident of National Significance
JFO.....Joint Field Office
JIC.....Joint Information Center
JOC .....Joint Operations Center
keV.....kiloelectron volts
km .....kilometer
LLNL .....Lawrence Livermore National Laboratory
$\mu Ci/m^2$ .....microcuries per square meter
µR/hr .....microroentgen per hour
mR.....milliroentgen (unit of exposure to x- or gamma-radiation)
MRE.....meals ready to eat
Mrem.....millirem (a unit of radiation dose)
NaI(T*l*) .....sodium iodide thallium activated
NARAC.....National Atmospheric Release Advisory Capability
NASA.....National Aeronautics and Space Administration
NCS.....National Communications System
NIMS.....National Incident Management System
NNSA/HQ.....National Nuclear Security Administration Headquarters
NNSA/NSO.....National Nuclear Security Administration Nevada Site Office
NOAA .....National Oceanic and Atmospheric Administration
NRC .....U.S. Nuclear Regulatory Commission
NRP.....National Response Plan
NSA.....National Security Area

OSC.....On-Scene Coordinator
PAG.....Protective Action Guide
PAO.....Public Affairs Officer
PAR.....Protective Action Recommendation
PFO.....Principal Federal Official
psi.....pounds per square inch
RAP.....Radiological Assistance Program
RCO.....Regional Coordinating Office
REAC/TS.....Radiation Emergency Assistance Center/Training Site
rem.....roentgen equivalent man (a unit of radiation dose)
RERT.....Radiological Emergency Response Team
R/N.....radiological or nuclear incident
RSL.....Remote Sensing Laboratory
SEO.....Senior Energy Official
SFO.....Senior FEMA Official
SHARC.....Sandia Hazard Assessment Response Capability
SNL.....Sandia National Laboratories
SSA.....Senior Scientific Advisor
TEDE.....Total Effective Dose Equivalent
TLD.....thermoluminescent dosimeter
USDA.....U.S. Department of Agriculture
VA.....U.S Department of Veterans Administration
WHO.....World Health Organization

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TABLE OF CONTENTS

APPENDICES

FIGURES

TABLES

1.0 INTRODUCTION

1.1 Purpose

This manual describes the Federal Radiological Monitoring and Assessment Center's (FRMAC's) response activities in a radiological incident of national significance.[1] It also outlines how FRMAC fits in the National Incident Management Structure (NIMS) under the National Response Plan (NRP) and describes the Federal assets and subsequent operational activities which provide Federal radiological monitoring and assessment of the affected areas. These areas may include one or more affected states or other countries/territories.

1.2 U.S. Department of Homeland Security (DHS)

The Homeland Security Act of 2002 established the DHS to prevent terrorist attacks within the United States; reduce the vulnerability of the United States to terrorism, natural disasters, and other emergencies; and minimize the damage and assist in the recovery from terrorist attacks, natural disasters, and other emergencies. The act also designated DHS as "a focal point regarding natural and manmade crises and emergency planning."

1.3 National Response Plan (NRP)

The NRP implements the domestic incident management authorities, roles, and responsibilities of DHS as defined in Homeland Security Presidential Directive-5 (HSPD-5), Management of Domestic Incidents and the Robert T. Stafford Disaster Relief and Emergency Assistance Act (Stafford Act). It establishes a comprehensive, national, all-hazards approach to domestic incident management across a spectrum of activities including prevention, preparedness, response, and recovery. It is applicable to domestic incident management in the context of terrorist attacks, major disasters, and other emergencies. The NRP applies to all Federal departments and agencies that may be requested to provide assistance or conduct operations in actual or potential Incidents of National Significance. These incidents require a coordinated response by an appropriate combination of Federal, state, local, tribal, private-sector, and nongovernmental entities.

Nothing in the NRP alters the existing authorities of individual Federal departments and agencies. The NRP does not convey new authorities upon the Secretary of Homeland Security or any other Federal official.[2]

[1] The term "radiological incident" is used throughout this report. It is applicable to an accident, an incident, a potential accident, or a potential, perceived, or deliberate act to spread radioactivity in the environment.
[2] *National Response Plan*, December 2004.

1.3.1 Nuclear / Radiological Incident Annex (Nuc/Rad Annex)

"The Nuclear / Radiological Annex (Nuc/Rad Annex) to the NRP provides an organized and integrated capability for a timely, coordinated response by Federal agencies to terrorist incidents involving nuclear or radioactive materials (Incidents of National Significance), and accidents or incidents involving such material that may or may not rise to the level of an Incident of National Significance. DHS is responsible for overall coordination of all actual and potential Incidents of National Significance, including terrorist incidents involving nuclear materials."[3]

The NRP supersedes the Federal Radiological Emergency Response Plan, dated May 1, 1996. DHS/Emergency Preparedness and Response/Federal Emergency Management Agency (DHS/EPR/FEMA) is responsible for maintaining and updating the Nuc/Rad Annex.

1.3.2 Incidents of National Significance

Pursuant to HSPD-5, as the Principal Federal Official (PFO) for domestic incident management, the Secretary of Homeland Security declares Incidents of National Significance (INS), in consultation with other departments and agencies as appropriate, and provides coordination for Federal operations and/or resources, establishes reporting requirements, and conducts ongoing communications with Federal, state, local, tribal, private-sector, and nongovernmental organizations to maintain situational awareness, analyze threats, assess national implications of threat and operational response activities, and coordinate threat or incident response activities.

1.3.3 Interagency Incident Management Group (IIMG)

The Interagency Incident Management Group (IIMG) serves as the national headquarters-level multi-agency coordination entity for domestic incident management. When an Incident of National Significance is declared, the Secretary of Homeland Security also activates the IIMG based on the severity, magnitude, and complexity of the event. The IIMG monitors policy and operational courses of action implemented by individual departments and agencies, monitors progress, and reports status back through DHS representatives.

The IIMG Core Group includes representatives from Federal departments and agencies, DHS components, and other organizations as required. At the time of activation of the IIMG, actual IIMG membership and participation is tailored to include departments and agencies with the appropriate jurisdictional authority and expertise for the incident at hand. Radiological or nuclear events are included in the purview of the IIMG.

1.3.4 Coordinating Agencies and Cooperating Agencies

DHS, as the overall incident manager for Incidents of National Significance, is supported by Coordinating Agencies and Cooperating Agencies. Coordinating Agencies have specific

[3] *Nuclear / Radiological Incident Annex, National Response Pla*n. December 2004.

nuclear/radiological technical expertise and assets for responding to the unique characteristics of these types of incidents. Coordinating Agencies facilitate the nuclear/radiological aspects of the response in support of DHS. For any given incident, the Coordinating Agency is the Federal agency that owns, has custody of, authorizes, regulates, or is otherwise designated responsibility for the nuclear/radioactive material, facility, or activity involved in the incident. The Coordinating Agency is represented in the Joint Field Office (JFO) Coordination Group, the Interagency Incident Management Group (IIMG), and the Homeland Security Operations Center (HSOC).

Coordinating Agencies are also responsible for leading the Federal response to nuclear/radiological incidents of lesser severity (those incidents that do not reach the level of an Incident of National Significance). A complete discussion of the criteria for designating an Incident of National Significance may be found in the NRP.

Cooperating Agencies provide technical and resource support, as requested by the Coordinating Agency or DHS. Depending upon the circumstances of the event, agencies may be designated as either Coordinating Agencies or Cooperating Agencies (refer to Section 2.1 for a more detailed discussion of the responsibilities of various Coordinating Agencies according to type of incident.)

1.3.5 National Incident Management System

The structure for NRP coordination is based on the National Incident Management System (NIMS) construct: Incident Command System (ICS) / Unified Command on-scene supported by an Area Command (if needed), multi-agency coordination centers, and multi-agency coordination entities.

When a FRMAC is established it operates under the parameters of the ICS. Position titles within the FRMAC organization have been changed to bring them in line with the ICS structure and to facilitate working in a unified command structure.

1.4 Radiological Response in Perspective

State, tribal, county, and/or city governments have primary responsibility for determining and implementing measures to protect health, safety, property, and the environment in all areas outside the boundaries of a fixed nuclear facility or those not under the control of a Federal agency. The owner or operator of a nuclear facility has primary responsibility for actions within the boundaries of that facility; for providing notification and advice to state, local, and tribal officials; and for minimizing the off-site radiological hazard to the public.

When a radiological emergency occurs, the highest priority is protecting the public. All Federal response activities are focused on assisting the state(s) in accomplishing this. Whether real or perceived, public health concerns will remain the paramount priority during the entire response activity. Response activities will begin with computer projections to make rapid, early recommendations. These projections will also drive the monitoring response activities. Once the data has been collected and assessed at the FRMAC, the projections will be refined to assist the state in taking actions to prevent or minimize hazards to the public.

For emergencies involving an area under Federal control, the responsibility for "on-site" actions belongs to the Federal government while "off-site" actions are the responsibility of the state, tribal, and/or local governments. For all other emergencies, the state, tribal, and/or local government has the responsibility for taking emergency actions, both "on-site" and "off-site".

The term "on-site" traditionally describes the area inside the fence line or property line of the facility which is experiencing the emergency. This concept was developed with nuclear power plants as the benchmark, and the belief that the boundary between "on-site" and "off-site" would be fixed and permanent. Emergency response plans and procedures have evolved significantly since the terrorist events of September 11, 2001, and the connotation of the terms "off-site" and "on-site" has been redefined as follows:

> In the event of a nuclear weapon accident, the term "on-site" refers to the area within the National Security Area (NSA). This boundary is established by the U.S. military and encompasses all regions where nuclear weapon components may be present. "Off-site" would denote all other external areas during the functioning of the NSA. As soon as the weapon is secured and all debris removed from the area, the NSA designation is removed. The state and/or local authorities assume control and management of the response for the entire affected area. The FRMAC will incorporate the area into on-going monitoring operations.
>
> If a terrorist event were to occur, "on-site" would be defined as the area where the Incident Commander defined a perimeter to identify the crime scene or area where dangers may still exist. Again, once the initial criminal and forensic investigation is completed, the "on-site" boundary would be lifted and the state or local authorities would assume control. The FRMAC would continue monitoring operations, and the former "on-site" area would now be part of the monitoring plan. "Off-site" would denote all other external areas.
>
> In the event of a nuclear power plant or fixed facility event, the term "on-site" still refers to the area inside the fence or property line. "Off-site" would continue to refer to all areas outside the fence or property line.

Because the assignment of specific responsibilities for protecting the public varies from state to state and tribal, county, and city interests are involved as well, this manual employs the term *"local authorities"* to generically address the local group in the public sector (including tribal) that has radiological protection responsibilities for the public.

1.5 Federal Radiological Monitoring and Assessment Center (FRMAC) Mission

A FRMAC is established in response to a request from a Coordinating Agency or state when there is a suspected release of radioactive materials or when a radiological incident of national significance is anticipated, suspected, or has occurred. The FRMAC becomes a coalition of all Federal off-site monitoring and assessment efforts to assist the Coordinating Agency, state(s), and local authorities. State and local authorities are invited and encouraged to co-locate and prioritize monitoring and assessment efforts in the FRMAC.

A FRMAC provides an operational framework for coordinating all Federal off-site radiological monitoring and assessment activities during a radiological emergency. The support includes:

1. Coordinating Federal offsite radiological environmental monitoring and assessment activities;
2. Maintaining technical liaison with state and local agencies with monitoring and assessment responsibilities;
3. Maintaining a common set of all offsite radiological monitoring data, in an accountable, secure, and retrievable form, and ensuring the technical integrity of the FRMAC data;
4. Providing monitoring data and interpretations, including exposure rate contours, dose projections, and any other requested radiological assessments, to the Coordinating Agency, and to the states;
5. Providing, in cooperation with other Federal agencies, the personnel and equipment needed to perform radiological monitoring and assessment activities;
6. Requesting supplemental assistance and technical support from other Federal agencies as needed; and
7. Arranging consultation and support services through appropriate Federal agencies to all other entities (e.g., private contractors) with radiological monitoring functions and capabilities, and technical and medical advice on handling radiological contamination and population monitoring.

Potential radiological emergencies that fall within the scope of a FRMAC activation vary widely in terms of the area affected, the nature of the contamination, and the scope of the government's response. Detonation of a nuclear device, accidental release of radiation from a nuclear power plant, and a terrorist threat are just a few of the many possible scenarios that the FRMAC must be prepared to address. Through all this, supporting the state and local organizations in the protection of the public remains the primary goal of the Federal response.

2.0 RESPONSIBILITIES

The management responsibilities for a Federal radiological emergency response may be divided among several agencies and organizations. The overall responsibility for coordinating the response is scenario dependent. These responsibilities are discussed below.

2.1 U.S. Department of Homeland Security (DHS)

DHS coordinates the overall Federal response to radiological Incidents of National Significance in accordance with HSPD-5 and the NRP. A detailed description of the organizational framework that DHS utilizes to respond to both terrorist and non-terrorist Incidents of National Significance can be found in the NRP Base Plan.

Following a terrorist attack, major disaster, or other emergency, the Secretary of the U. S. Department of Homeland Security (DHS) designates a Federal officer to serve as the PFO to

represent the DHS Secretary at the incident and oversee and coordinate Federal activities relevant to the incident. The PFO will ensure overall coordination of Federal domestic incident management activities and resource allocation on scene, ensuring a seamless integration of Federal incident management activities in support of state, local, and tribal requirements. The PFO provides a primary point of contact and situational awareness locally for the Secretary of Homeland Security. The Secretary is not restricted to DHS officials when selecting a PFO.

The PFO does not direct or replace the incident command structure established at the incident, nor does the PFO have directive authority of Federal and state officials. The PFO also provides a channel for media and public communications and an interface with appropriate jurisdictional officials pertaining to the incident.

For other radiological incidents of lesser severity, other Federal response plans (i.e., the NCP and/or agency specific radiological incident response plans) may also be utilized, as appropriate.

2.1.1 U.S. Department of Homeland Security/Emergency Preparedness and Response/Federal Emergency Management Agency (DHS/EPR/FEMA)

For Stafford Act or Federal-to-Federal support incidents, DHS/EPR/FEMA coordinates the provision of Federal resources and assistance to affected state, local, and tribal governments as part of the JFO Operations Section or other appropriate location established by DHS/EPR/FEMA. The general responsibilities of DHS/EPR/FEMA are to:

1. Maintain the operation of the Regional Response Coordination Center (RRCC).
2. Promote coordination among Federal agencies with the state(s) and local authorities concerning interactions on non-radiological issues.
3. Serve as the coordinator for information related to the Federal non-radiological response.

2.2 Coordinating Agencies

The Coordinating Agency is the Federal agency which owns, has custody of, authorizes, regulates, or is otherwise deemed responsible for the radiological facility or activity involved in the incident. Table 1 identifies the Coordinating Agency for a variety of radiological incidents. For example, the U.S. Nuclear Regulatory Commission (NRC) is the Coordinating Agency for incidents involving nuclear facilities licensed by the NRC; DOE is the Coordinating Agency for incidents involving transportation of radioactive materials shipped by or for DOE.

The Coordinating Agency will:

1. Coordinate the overall activities (both on-site and off-site) of all Federal agencies during all phases of a radiological emergency response.
2. Oversee on-site response and support operator activities.
3. Assist state(s) and local authorities in determining appropriate measures to protect the public, property, and the environment.

4. Coordinate and provide all Federal Protective Action Recommendations (PARs) to the state(s) and local authorities.
5. Ensure that Federal agencies assist state(s) and local authorities in implementing protective actions, if requested.
6. Serve as the principal Federal source of information for on-site conditions; coordinate all public information on Federal response activities; and provide information to Congress, the White House, and the Department of State (when foreign countries are affected).
7. Establish on-scene response centers:
   - The Joint Field Office (JFO) is the coordination center for the overall federal response.
   - The Joint Information Center (JIC) coordinates information to the public and media.

2.2.1 U.S. Department of Energy (DOE)

The NRP assigns DOE the responsibility for establishing and initially managing the FRMAC.

Under the NRP, when a FRMAC is activated, DOE's responsibilities are to:

1. Provide technical support to the Coordinating Agency, state(s), and local authorities by establishing the FRMAC and coordinating the off-site Federal radiological monitoring, assessment, and evaluation of data.
2. Provide various operational assets including radiation detection and measurement equipment, communications support, and aerial monitoring capability, as appropriate.
3. Following the initial phase of the emergency, provide off-site support to the EPA when it assumes management of the FRMAC.

2.2.1.1 Association Between DOE and NNSA (National Nuclear Security Administration)

The NNSA is a separately organized agency of DOE whose mission is to strengthen the security of the United States by applying nuclear science and technology to military purposes and by reducing the global threat from weapons of mass destruction.

The mission of the Administration is the following:

1. To enhance United States national security through the military application of nuclear energy.
2. To maintain and enhance the safety, reliability, and performance of the United States nuclear weapons stockpile, including the ability to design, produce, and test, in order to meet national security requirements.
3. To provide the United States Navy with safe, militarily effective nuclear propulsion plants and to ensure the safe and reliable operation of those plants.
4. To promote international nuclear safety and nonproliferation.
5. To reduce global danger from weapons of mass destruction.
6. To support United States leadership in science and technology.

DOE Headquarters (DOE/HQ) has assigned the responsibility for FRMAC to the National Nuclear Security Administration Nevada Site Office in Las Vegas, Nevada (NNSA/NSO). This office provides day-to-day management; development of FRMAC plans, procedures, and exercise coordination; and oversight of working groups.

Table 1. Coordinating Agencies

Type of Incident	Coordinating Agency
a. Radiological terrorism incidents (e.g., RDD/IND or radiological exposure device): (1) Material or facilities owned or operated by DoD or DOE (2) Material or facilities licensed by NRC or Agreement State (3) All others	 (1) DoD or DOE (2) NRC (3) DOE
b. Nuclear facilities: (1) Owned or operated by DoD or DOE (2) Licensed by NRC or Agreement State (3) Not licensed, owned, or operated by a Federal agency or an Agreement State, or currently or formerly licensed facilities for which the owner/operator is not financially viable or is otherwise unable to respond	 (1) DoD or DOE (2) NRC (3) EPA
c. Transportation of radioactive materials: (1) Materials shipped by or for DoD or DOE (2) Shipments of NRC or Agreement State-licensed materials (3) Shipment of materials in certain areas of the coastal zone that are not licensed or owned by a Federal agency or Agreement State (see USCG list of responsibilities for further explanation of "certain areas") (4) All others	 (1) DoD or DOE (2) NRC (3) DHS/USCG (4) EPA
d. Space vehicles containing radioactive materials: (1) Managed by NASA or DoD (2) Not managed by DoD or NASA impacting certain areas of the coastal zone (3) All others	 (1) NASA or DoD (2) DHS/USCG (3) EPA
e. Foreign, unknown or unlicensed material: (1) Incidents involving foreign or unknown sources of radioactive material in certain areas of the coastal zone (2) All others	 (1) DHS/USCG (2) EPA
f. Nuclear weapon accident/incident (based on custody at time of event)	DoD or DOE
Other types of incidents not otherwise addressed above	DHS designates

2.2.2 U.S. Environmental Protection Agency (EPA)

The NRP assigns to EPA the responsibility for managing the FRMAC during the intermediate and long-term phases of a response. Throughout a response, EPA provides response support through its Radiological Emergency Response Team (RERT), which is an independent special team specified in the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). The RERT provides support to both the FRMAC and EPA's On-Scene Coordinators (OSCs) under the NCP.

The EPA's Senior Official (SO) in the FRMAC is typically one of the RERT commanders. EPA SO is to advise the DOE FRMAC Director during the emergency and intermediate phases of the response for issues specific to long-term monitoring and recovery that might be implemented during earlier phases. At an appropriate time during an intermediate phase, the EPA SO will begin a dialogue culminating in a transfer of FRMAC control from DOE to EPA.

After the conditions for transfer of control, as cited in the NRP and discussed in Section 5.0 of this document, are met and a formal document is signed, the EPA will assume the Federal agency responsibility for coordinating the intermediate- and long-term off-site radiological monitoring, sampling, and assessment activities. When this occurs, DOE and other Federal agencies will continue to commit the equipment, personnel, and funds for the duration of the Federal response effort as necessary. Concurrence from other Federal, state, or local entities may be necessary.

After transfer, the EPA SO will work with whatever cleanup group (Site Restoration Working Group, Decontamination Committee, etc.) is in charge of the overall cleanup. The FRMAC will continue to provide monitoring data for cleanups as well as keep reassessing problem areas.

In time, the EPA-led FRMAC will scale down into a smaller EPA and EPA-contractor entity. This will include relocating out of the original FRMAC location and establishing whatever near-site facility is necessary to accomplish the monitoring mission.

2.5 State and Local Authorities

State and local authorities are responsible for the health and welfare of the general public during an emergency. They will assess the situation and issue instructions for necessary protective actions. The state receives Federal PARs from the Coordinating Agency which serves as the Federal channel for such recommendations.

2.6 Advisory Team for Environment, Food, and Health (Advisory Team)

The Advisory Team for Environment, Food, and Health (Advisory Team) provides advice on food and health matters to DHS, the JFO Coordination Group, the Coordinating Agency, and State, local, and tribal governments. The team includes representatives from DHS, EPA, the U.S. Department of Agriculture (USDA), the U.S. Food and Drug Administration (FDA), the Centers for Disease Control (CDC), and other Federal agencies, as warranted by the incident. The Advisory Team provides recommendations in matters relating to:

- Field monitoring; emergency Protective Action Guides (PAGs) and their applications

- Protective Action Recommendations (PARs) using data and assessment from the CM/FRMAC
- Protective actions to prevent or minimize contamination of milk, food, and water to prevent or minimize exposure through ingestion
- Recommendations to relocation, reentry, return, and recovery
- The disposal of contaminated livestock; health and safety advice for the public and for workers
- Estimate effects of radioactive releases on human health and environment
- Other matters as requested by the Coordinating Agency.

The Advisory Team provides direct support to the Coordinating Agency and has no independent authority. It will not release information or make recommendations to the public unless authorized to do so by the Coordinating Agency.

To fulfill the needs of the Coordinating Agency, the Advisory Team must interface with the FRMAC to facilitate ready access to the FRMAC data and assessments. In order to effectively accomplish this, the Advisory Team should be co-located with the FRMAC.

2.7 Other Federal Agencies

All other Federal agencies, not previously identified as having a management and/or support role, will respond in accordance with the NRP, and other inter-agency agreements subordinate to the NRP, at the request of the DHS, Coordinating Agency, DOE, or the impacted state(s) or in accordance with established statutory responsibilities.

2.8 Public Information Coordination

Public information coordination is most effective when the owner/operator, Federal, state, local, and other relevant information sources participate jointly. The primary location for linking these sources is the Joint Information Center (JIC).

Prior to the establishment of Federal operations at the JIC, it may be necessary to release Federal information regarding public health and safety. In these instances, Federal agencies will coordinate with the Coordinating Agency and the state(s) in advance or as soon as possible after the information has been released.

3.0 ACTIVATION

3.1 Description of the Emergency

When DHS or DOE are formally notified of a radiological emergency and a FRMAC is requested, DOE will obtain a description, as detailed as possible, of the emergency. To ensure a timely and appropriate response, the following information will be requested:

1. The nature and condition of the emergency (i.e., is a release imminent, in process, or has it already occurred?).
2. The type of facility or radiological material involved in the emergency (e.g., a power reactor, nuclear material, etc.).
3. The location of the emergency and the nearest major city or town.
4. An estimate of the source term and isotope(s) involved and the chemical and physical form, if known.
5. The name and telephone number of a technical person from the reporting organization who is knowledgeable about the radiological situation.
6. The extent of knowledge about the release and distribution.
7. Public protective actions initiated.
8. The meteorological conditions at the time of the emergency.

3.2 Call-Up Procedures/Authorities

At the request of DHS/EPR/FEMA, the Coordinating Agency and/or state, DHS will authorize DOE/NNSA to activate and deploy the offsite Federal radiological monitoring assistance assets. The DOE assets supporting the FRMAC are the Radiological Assistance Program (RAP), the Consequence Management Official (CMO), the Consequence Management Home Teams (CMHT), the Consequence Management Response Team (CRMT) Phases I, II, and III (Appendix B), the National Atmospheric Release Advisory Capability (NARAC) (Appendix E), the Aerial Measuring System (AMS) (Appendix D), and the Radiation Emergency Assistance Center/Training Site (REAC/TS) teams (see Figure 1).

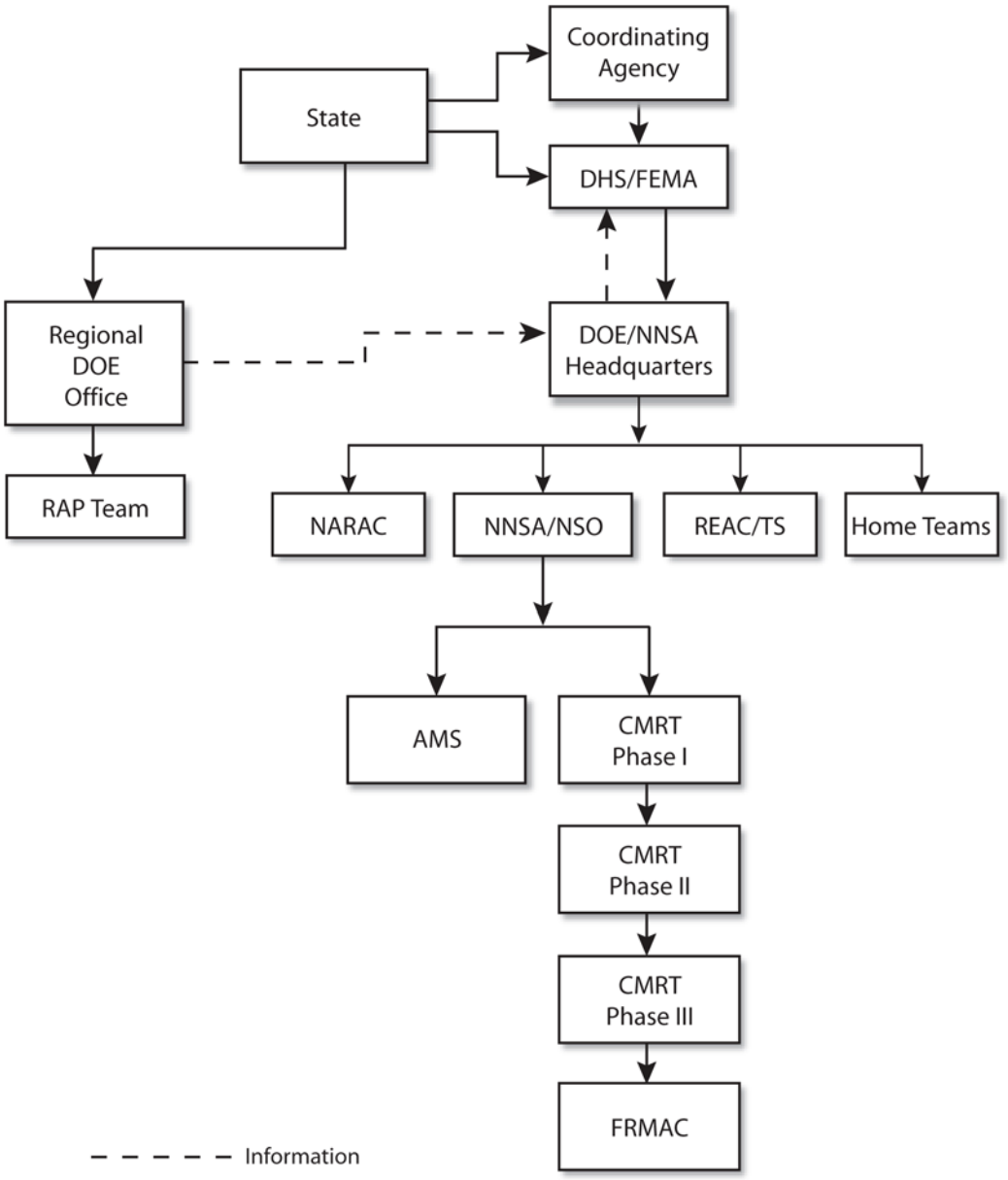


FIGURE 1. ***DOE ALERT, ACTIVATION, AND DEPLOYMENT***

3.3 Phased Response Approach

To aid in ensuring a timely response to state and Coordinating Agency requests for FRMAC services, DOE/NNSA has developed a phased response approach for deploying monitoring, sampling, analysis, and assessment resources. The consequence management response teams are deployed by NNSA/Nevada Site Office (NNSA/NSO). Resource deployment is divided into three phases with each phase incorporating both management and operational capabilities. Organizational structure is comparable in each phase of the response. This will facilitate the integration of other Federal and state resources into the FRMAC.

Throughout this document, the terms Consequence Management Response Team Phase I (CMRT Phase I), Consequence Management Response Team Phase II (CMRT Phase II), and Consequence Management Response Team Phase III (CMRT Phase III) are used. These terms refer exclusively to NNSA/NSO resources that have been organized in a three-tier system to support FRMAC and other consequence management responses.

3.4 FRMAC Activation Stages

When DHS/FEMA authorizes DOE/NNSA to deploy a CM/FRMAC response, the manager of NNSA/NSO, with the concurrence of DOE/NNSA, designates a FRMAC Director and initiates a CM/FRMAC deployment. The first team deployed to the field will be the on-duty CMRT I team as well as the on-duty EPA RERT Commander. The FRMAC Director and the EPA SO will accompany this team. Within hours, the CMRT II will then deploy to augment the CMRT I team, followed by additional support and logistics personnel and equipment. This represents the NNSA/NSO's contribution to the CM/FRMAC. Each phase complements the team already at the site of the emergency response. As each team arrives in the field, they will be in constant contact with the team not yet deployed to ensure a prudent and reasonable follow-on response effort. Other Federal agencies that contribute to the CM/FRMAC response will coordinate with the FRMAC Director upon their arrival at the incident site.

3.5 Advance Party Meeting

After receiving notification to deploy, the NNSA/NSO will deploy CM assets to the emergency location. Planning elements of the CMRT will contact the local logistics officials for coordination of the CMRT I arrival. Elements of CMRT I will meet with the Coordinating Agency and the state(s) upon arrival at an Advance Party Meeting to determine their requirements, define the appropriate level and composition of the consequence management response, and locate a suitable site to conduct operations. Refer to Appendix E for details regarding site-selection criteria and logistics requirements.

During the Advance Party meeting, members of the CMRT I will obtain the status of the emergency, public protective actions which have been initiated, available monitoring data, and any other pertinent information. In addition, CM/FRMAC, the Coordinating Agency, and state liaisons will be identified and the FRMAC Monitoring and Sampling Strategy will be developed. This plan will reflect the state and Coordinating Agency requirements and emphasize public safety. Appendix F contains the Advance Party Meeting Checklist (Figure F-1), followed by a sample of a FRMAC Monitoring Implementation Plan (Figure F-2).

3.6 Primary DOE Assets Accessible to FRMAC, EPA, and Other Federal Agencies

The DOE and EPA provide significant radiation monitoring, analysis, and assessment equipment as well as highly skilled professionals. In addition, the CMRT element brings essential communications, logistics, photo/video, computer network, and mechanical/electrical support. Both

institutional and mobile laboratories are available from DOE, EPA, and other Federal agencies. The Federal communities that comprise FRMAC may provide equipment and/or personnel to state, county, or local Emergency Operations Centers (EOCs) to augment communication processes with the FRMAC, as requested. The following DOE assets will be activated and deployed, depending upon the real or potential impact of the emergency.

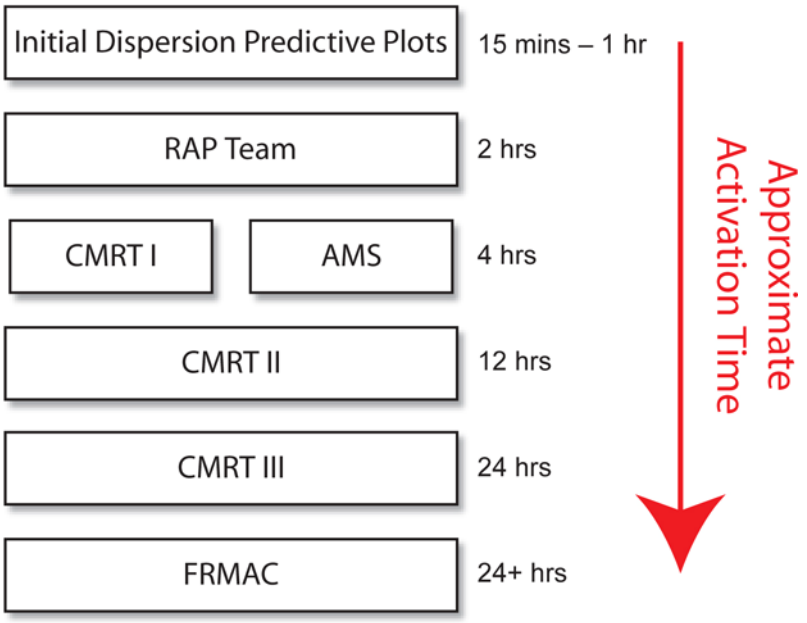


FIGURE 2. ***ACTIVATION SEQUENCE FOR VARIOUS DOE-RELATED ASSETS ONCE AUTHORIZED***

3.6.1 National Atmospheric Release Advisory Center (NARAC)

The NARAC is a DOE asset located at the National Atmospheric Release Advisory Center (NARAC), a facility located at Lawrence Livermore National Laboratory (LLNL) in Livermore, California. NARAC is a resource center for planning, real-time assessment, and detailed analysis of atmospheric releases involving nuclear, radiological, chemical, or biological material. To model atmospheric incidents, NARAC ingests over a million real-time meteorological observations a day from around the world. The Center can quickly project the downwind consequences from releases occurring from a few days in the past to a few days in the future. For future projections, NARAC receives NOAA and U.S. Navy weather forecast products, and can also run a high-resolution mesoscale weather forecast model over the area of interest.

The national center is staffed weekdays. Off hours, staff are available with a one-hour recall. The DOE NARAC program can be activated through the RAP team, the DOE Regional Coordinating Office (RCO), or DOE HQ. NARAC's primary products are calculated contour plots overlaid on a map of the emergency area. The minimum information needed to make a calculation is the time and location of the event. From this information NARAC can display the general downwind area of concern. If an estimate of the amount and type of material released (source term) is available, specific consequences can be estimated. A more detailed discussion of NARAC is outlined in Appendix D.

3.6.2 Sandia Hazard Response Capability (SHARC)

Sandia National Laboratories has developed modeling and simulation software to be used during radiological emergencies. This modeling software called Sandia Hazard Response Capability, or SHARC, is capable of simulating the conventional dispersal of radiological material, as well as the fallout from a nuclear explosion. It is compatible with NARAC, but is adapted to be useful on a deployed mission scenario. Conventional dispersal of radiological material can be simulated in either an unmitigated mode, mitigated mode, or simultaneously in both modes. Nuclear dispersal of radioactive material can be simulated for one to three years. These dispersal simulations can be created simultaneously. This capability allows for the simulation of a range of possible yields and effects. This feature can be used to help bound the effect that could result from the detonation of a nuclear device. A more detailed discussion of SHARC capabilities is outlined in Appendix D.

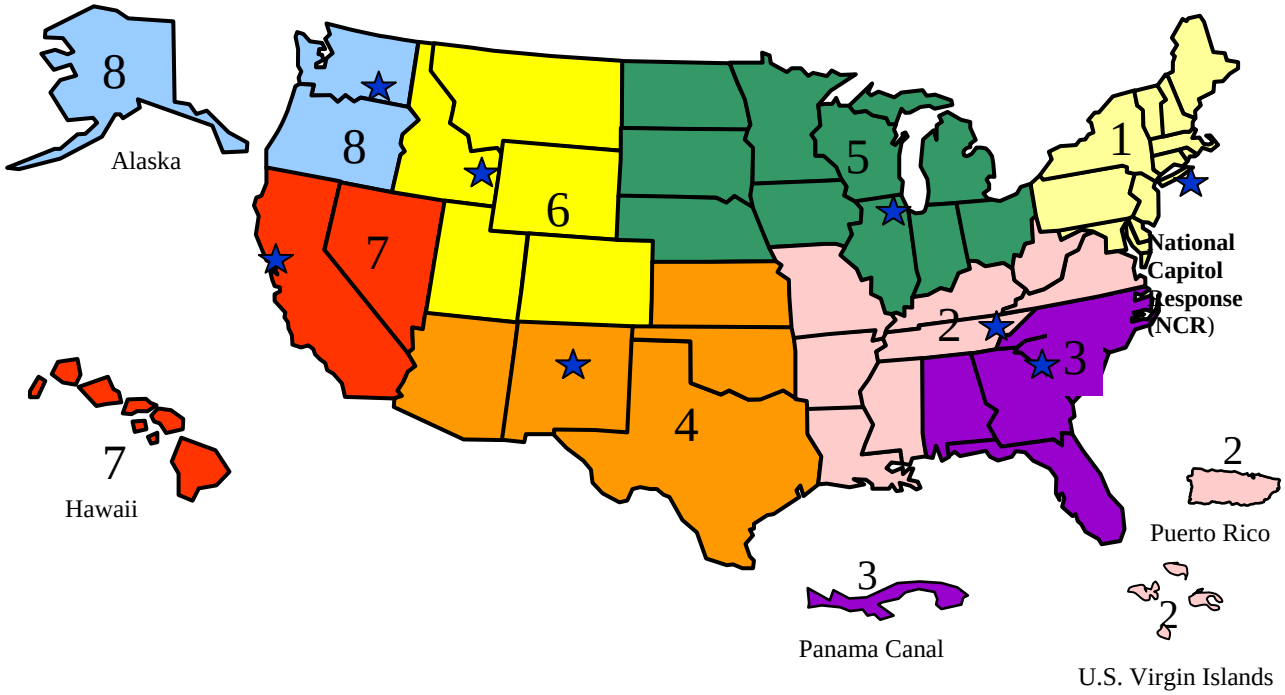
3.6.3 Radiological Assistance Program (RAP) Response

RAP is DOE/NNSA's first responding resource in assessing an emergency situation and advising decision makers on what further steps could be taken to evaluate and minimize the hazards of a radiological emergency. RAP is capable of providing assistance for all types of radiological incidents. RAP support may be limited to advice given over the telephone or extend to sending skilled personnel and equipment to the accident scene to help evaluate, assess, advise, isotopically identify, search for, and assist in the mitigation of actual or perceived radiological hazards and risks to workers, the public and the environment.

DOE/NNSA implements RAP on a regional basis. DOE/NNSA Regional Coordinating Offices (RCOs) have been established in each of the eight DOE Regions (see Figure 3) to provide radiological assistance, upon request, on a 24-hour basis. Requests for DOE/NNSA radiological assistance should be directed to the appropriate DOE/NNSA RCO or to DOE Headquarters.

Each RCO has a minimum of three RAP teams. A full RAP team has eight members, including a Federal Team Leader. The number of RAP personnel deployed will be tailored to meet the needs of the particular incident and may be as few as two people. Multiple RAP teams may also be deployed if warranted by the situation. The RAP team can be expected to be on-scene within six hours of activation.

RAP has expertise in radiological assessment, area monitoring, air sampling, and exposure and contamination control. RAP's capabilities and resources include portable field radiation and contamination monitoring instrumentation (alpha, beta, gamma, and neutron), air sampling equipment, portable gamma spectroscopy systems, decontamination supplies, communications equipment, and personal protective gear. The teams, however, do not typically bring soil, water, and vegetation sampling capabilities for the initial response.



Region	Contact for Questions	24-Hour Telephone for Assistance
NCR	Regional Response Coordinator, U.S. Department of Energy P.O. Box 380, M/S RSL-AO, Suitland, MD 20752	(301) 817-3301
1	Regional Response Coordinator, Brookhaven Site Office 53 Bell Ave., Long Island, NY 11973	(631) 344-2200
2	Regional Response Coordinator, Oak Ridge Office P.O. Box 2001, Oak Ridge, TN 37831	(865) 576-1005
3	Regional Response Coordinator, Savannah River Site Office P.O. Box A, Aiken, SC 29802	(803) 725-3333
4	Regional Response Coordinator, NNSA Service Center P.O. Box 5400, Albuquerque, NM 87135	(505) 845-4667
5	Regional Response Coordinator, Chicago Office 9800 S. Cass Ave., Argonne, IL 60439	(630) 252-4800
6	Regional Response Coordinator, Idaho Operations Office 850 Energy Place, Idaho Falls, ID 83402	(208) 526-1515
7	Regional Response Coordinator, Livermore Site Office P.O. Box 808, L-293 Livermore, CA 94551	(925) 422-8951
8	Regional Response Coordinator, Richland Operations Office P.O. Box 550, Richland, WA 99354	(509) 373-3800

FIGURE 3. ***MAP OF DOE RAP REGIONS WITH FRMAC RESPONSE LOCATIONS***

3.6.4 Consequence Management Response Teams (CMRT)—Overall Concept

The CMRT deploys in three phases – Phase I (emergency), Phase II (intermediate), and Phase III (characterization). Each phased-response element deploys with a standard equipment package and qualified and trained personnel to support the technical needs during each phase of the response. During an incident, Consequence Management Home Teams are stood up at the various laboratories to provide both technical and logistical assistance.

3.6.5 CMRT Phase I Response

CMRT Phase I is a small response group both in terms of personnel and equipment. It is prepared to deploy from Las Vegas within 4-hours following notification. The size of the team (31 members) and the relatively small load of equipment (2,000 pounds) give it the flexibility to meet a short deployment time line.

This phase serves as a quick response element to augment RAP in U.S. responses and will typically be the initial operational response element for foreign deployments. It also provides the core Command and Control for FRMAC contributions from other Federal agencies. The team incorporates all the disciplines necessary to support operations but only on a limited scale. These disciplines include radiation monitoring, sampling, analysis, assessment, health and safety, and support and logistics functions. It is designed for quick response and rapid radiological data collection and assessment in order to provide early health effects advice and timely characterization of the radiological situation to the officials responsible for making and implementing protective actions for the public. In addition, CMRT I has the capability to provide escort services for emergency workers entering potentially contaminated areas for lifesaving and/or forensic operations. Each specific emergency may require a tailored response.

3.6.5.1 Aerial Measuring System (AMS)

The AMS helicopter and fixed-wing aircraft (Figure 4) are equipped to measure radioactive material deposited on the ground. The aircraft, permanently based at Nellis Air Force Base (AFB) in Las Vegas, Nevada, and at Andrews AFB near Washington, D.C., are key components in a response to an emergency involving dispersal of radioactive material over a large area.

The DOE/NNSA AMS program has an extensive collection of background radiological and photographic surveys of nuclear facilities in the United States. These survey results can be used as a baseline for evaluating releases of radioactivity from an accident or incident at one of the sites. A more detailed discussion of the AMS capabilities is given in Appendix C. The AMS fixed-wing response can occur in the same time frame as the CMRT I deployment.

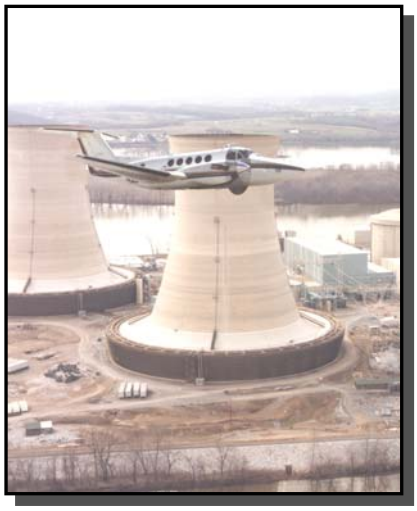


FIGURE 4. ***AMS PLATFORMS***

3.6.6 Consequence Management Response Team Phase II (CMRT II)

The CMRT II is designed to dispatch as an augmentation team to CMRT I. Upon field integration of CMRT I and CMRT II, the integrated group is referred to as the CMRT II team. This integrated CMRT II provides additional monitoring and assessment capability; allows for 24-hour emergency response activities; establishes the data, voice, and fax links with NNSA/NSO and DOE/HQ; and establishes Geographic Information System (GIS) support to the state and Coordinating Agency. If appropriate, CMRT II will initiate preparation for the arrival of the FRMAC.

CMRT I and II are comprised of assets from both NNSA/NSO and DOE. Both provide the DOE with the consequence management capability to rapidly respond to any radiological emergency anywhere in the world. For deployments to remote areas, DOE has the resources and capability to establish technical operations centers in tents equipped with portable generator alternating current power, air conditioning/heating, satellite communications, radio communications, tables, chairs, and other support equipment. In addition, for the housing and care of the phased responders, tents, sleeping bags, and food can be provided for several days (sufficient meals ready to eat [MREs] for 100 people for three days). As with CMRT I, a specific emergency may require a tailored response. Figure 5 shows the organization structure of a CMRT I with the integration of a CMRT II.

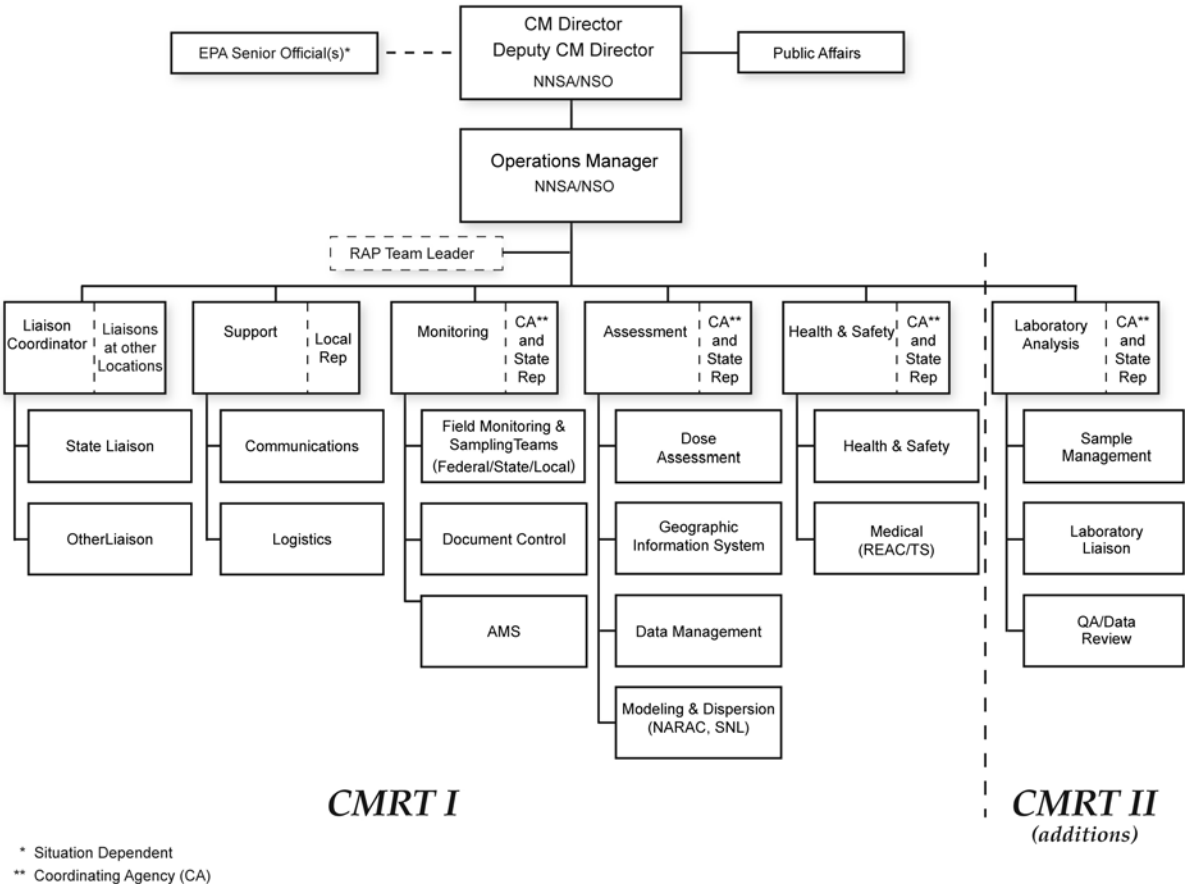


FIGURE 5. ***INTEGRATION OF CMRT PHASE I AND CMRT II***

3.6.7 Consequence Management Response Team Phase III (CMRT III)

The CMRT Phase III follows the same organizational structure as CMRT I and II but the level of integration of other agencies makes it close to a FRMAC. It is a 46 person team that augments Phases I and II and is staffed through the National Laboratories and the RAP regions. The main focus during the CMRT III will be sampling activities in the affected areas, dose assessment of the long-term clean up, remediation, food embargo, and other activities necessary to contain doses below the applicable PAGs. As the event transitions to the CMRT III phase, field analytical capability and capacity will be enhanced by the arrival and integration of the HOTSPOT mobile laboratory. HOTSPOT will bring additional QA/QC samples to integrate into the sample stream. Samples will also be "split" for analysis by multiple laboratories. Blank or "background" samples will also be included in samples sent to laboratories. Additional Sample Control Technicians will perform these tasks.

3.6.8 FRMAC

As defined in the NRP's Nuc/Rad Annex, the FRMAC is the multi-federal agency radiological initial response organization created for responding to radiological emergencies impacting the United States. The number of required FRMAC personnel is closely correlated with the number of FRMAC field monitoring teams because the basic functions of the FRMAC depend on the number of monitoring teams collecting field monitoring data and environmental samples.

The FRMAC provides long-term monitoring and assessment during the initial phase and into the long-range monitoring response. The FRMAC is an interagency organization with representatives from various federal, state, and local radiological response organizations. It has the assets and the capabilities to provide additional logistical and communications support for the inter-agency organizations responding to a radiological incident.

Figure 6 illustrates the organizational structure of a FRMAC.

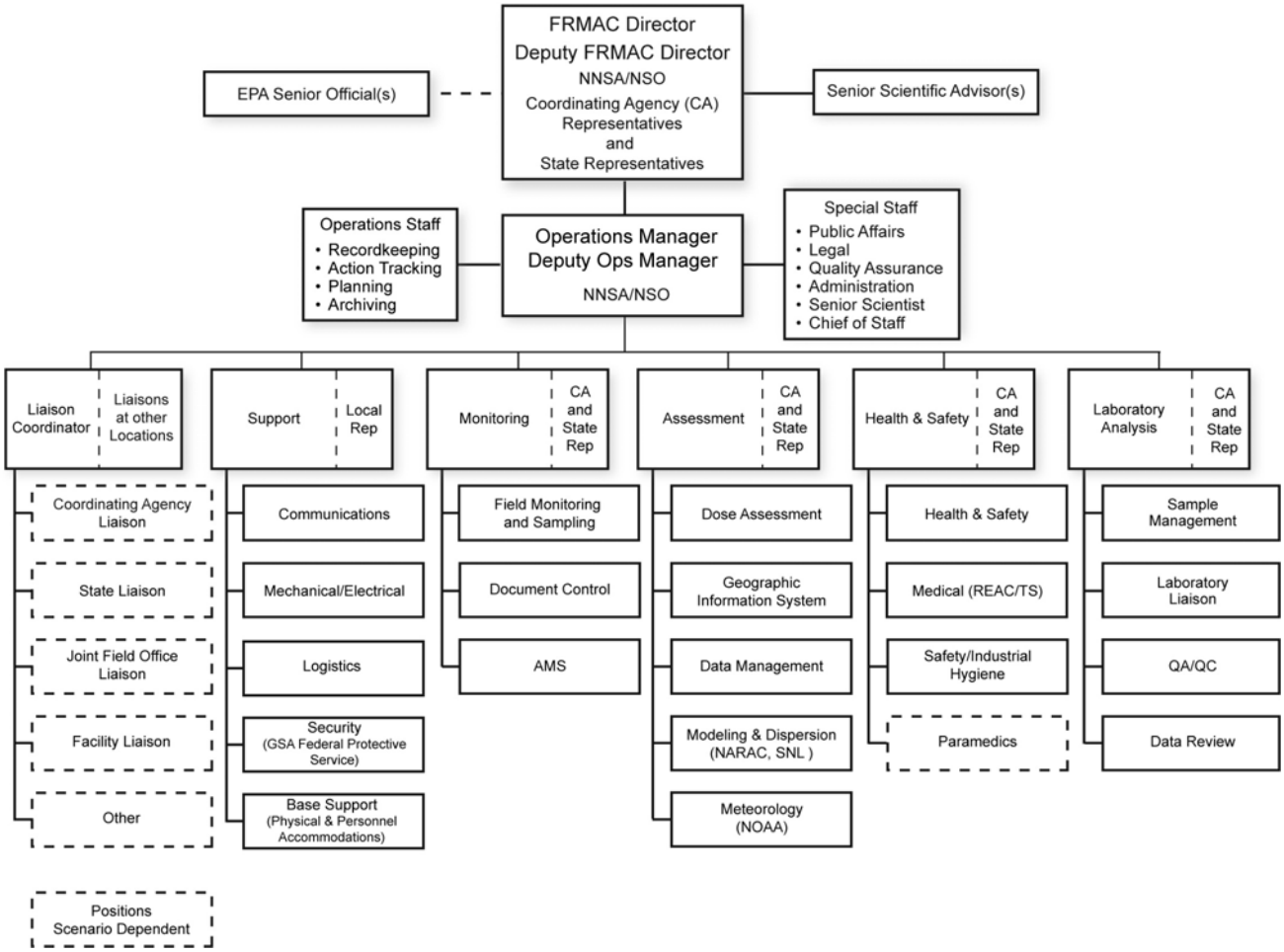


FIGURE 6. ***FRMAC ORGANIZATION***

3.6.9 EPA Radiological Emergency Response Team (RERT)

EPA's RERT is an independent, special team specified in the National Contingency Plan (NCP). It is a stand-alone unit capable of radiological response, but folds in to the FRMAC when that plan is activated. The RERT Commander becomes the Senior EPA Official in the FRMAC. This person is not the overall EPA Senior Official and may not be the EPA official representative to DHS during a terrorist activity.

3.6.10 Radiation Emergency Assistance Center/Training Site (REAC/TS)

The Radiation Emergency Assistance Center/Training Site (REAC/TS) and World Health Organization (WHO) Collaborating Center, located in Oak Ridge, Tennessee, provides 24/7 radiation emergency medical support NNSA's Accident Response Group (ARG) and the FRMAC. REAC/TS, on direction by NNSA, can provide deployable emergency medical and health physics support teams nationally or internationally for dose assessments, diagnosis, treatment, advice, recommendations and consultation for all types of radiological injuries/illnesses in response to a radiological or nuclear (R/N) incident. REAC/TS can provide emergency medical response to the FRMAC and ARG personnel for injuries/illnesses from other hazards that might complicate an R/N incident such as biological, chemical, thermal, or other physical events. REAC/TS can provide education/training related to radiation emergency medical response prior to, or at, R/N incidents. The REAC/TS' training can be tailored to the needs of NNSA personnel as well as to civilian response and health care personnel in a community or region affected by an R/N event. REAC/TS stocks and manages specific radiological countermeasures such as Zn-DTPA (Zinc trisodium diethylenetriaminepentacetate) and Ca-DTPA (Calcium triosodium diethylenetriaminepentacetate) and Prussian Blue (ferric hexacyanoferrate[II]) (U.S. FDA, New Drug Application) that might be required for treatment of internal contamination with various actinides.

4.0 FIELD ACTIVITIES

4.1 Emergency Response Operations Structure

FRMAC operations, by definition, support the state(s) and the Coordinating Agency. The Advisory Team and Federal, state, and local representatives may choose to co-locate in the FRMAC facility and carry out their own responsibilities related to, but separate from, the emergency response. It is expected that all activities will be coordinated through the FRMAC; however, FRMAC operations will not interfere with any obligation of other Federal, state, and local organizations to the emergency response. It is expected that the FRMAC operational structure will convert to the Incident Command System in the near future.

FRMAC is traditionally an "off-site" monitoring entity. However, in the case of terrorist activity or a transportation incident, the definition of the "site" might be vague. In such incidents, FRMAC will work with first responders (local, state, and Federal) to negotiate a time when FRMAC will direct all monitoring activities, including the "on-site" area. This would typically occur once the FBI no long

controls the site as at a crime scene, or after first responders have removed victims. This negotiation might be as simple as the Incident Commander releasing the site to FRMAC monitoring direction.

4.2 FRMAC Organization

The FRMAC organizational chart (Figure 6) shows the basic and most common operational configuration during a major radiological emergency. However, this chart may be modified during smaller, less significant radiological deployments. A description of key FRMAC positions and functions is given in Appendix I.

Figure 6 also shows participation by the Coordinating Agency and the state(s), which are the customers of the FRMAC. They play a major role in setting overall FRMAC priorities and activities. Their representatives are the link to the FRMAC Director and staff. They are responsible for delivering requests from their organizations to the Director and staff for FRMAC radiological products and services. Technical representatives from these organizations are located at key positions in the FRMAC to help implement their organizations' requirements and priorities.

4.3 Field Operation

Requests for information are received at the FRMAC from the Coordinating Agency and the state(s) and from other Federal agencies through the Coordinating Agency. These requests will be prioritized and transmitted to the appropriate FRMAC supervisor. Field monitoring teams or others will collect the requested data. The data will be reviewed by the appropriate staff, and the results will be evaluated, processed, and reported in the desired format. The data are provided, as soon as possible, simultaneously to the Coordinating Agency and state(s) representatives.

The FRMAC coordinates off-site, Federal, monitoring efforts and provides the following information without request and as needed.

- Plume and deposition predictions, as appropriate
- Air and ground concentrations
- Deposition patterns of isotopic concentrations, exposure rates, and dose projections
- Isotopic concentrations in environmental media
- Assurance of data quality
- Results of data collection, analysis, and evaluation
- Evaluations, assessments, and interpretation of data, as applicable
- Technical assistance to the Coordinating Agency and state(s) decision-making officials, as requested
- Meteorological reports and weather forecasts

The FRMAC database also contains the documentation to provide assurance of data quality and provides retrievable data of environmental contamination.

When the emergency phase is concluded, the source of radioactivity is determined to be stable, the environment has been characterized, and the participating Federal agencies have agreed to continue providing appropriate resources, DOE/NNSA will transfer the FRMAC management to the EPA at a mutually agreeable time. Details on the transfer process are discussed in section 5.0 of this manual.

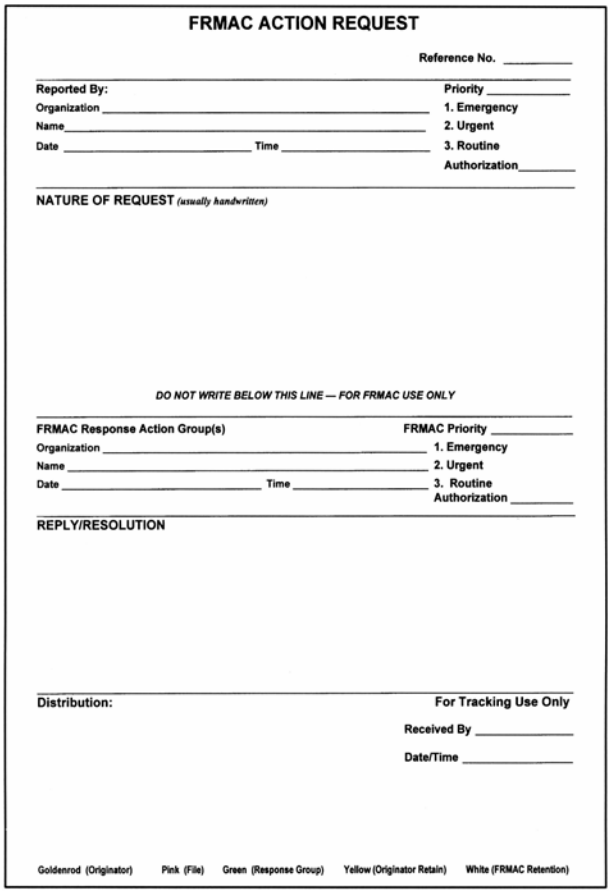
4.4 Setting FRMAC Priorities

The FRMAC reports monitoring data and assessments to the Coordinating Agency and the state(s). In turn, the Coordinating Agency and state(s) use this information to determine if new or additional protective actions are necessary. The highest priority for FRMAC activities is protecting public health and safety. Therefore, setting priorities for monitoring and assessment activities will be dictated by the needs of the Coordinating Agency and the state(s). There will be times, particularly in the early stages of a response, when the need for information and assistance may exceed FRMAC resources. Priorities must then be established. The process for setting FRMAC priorities when priorities exceed is described in this section.

4.4.1 FRMAC Action Requests

As the need for FRMAC services arise, the Coordinating Agency and the state(s) and/or local representatives to the FRMAC submit their requests to the FRMAC using the FRMAC Action Request Form (Figure 7***).*** Examples of requests might include monitoring data from a specific location or projected dose estimates of the inside and outside areas of a specific building for one year. As requests are received, the FRMAC Director, Operations Manager, and Coordinating Agency and state representatives review the new requests, the status of previous requests, and the status of current activities to determine and establish the new priorities for all requests. Additionally, FRMAC liaisons established at other locations submit requests to the FRMAC by using the Action Request Form.

FRMAC Action Request data are tracked and maintained in the Emergency Response Database System (ERDS). The program allows data to be easily retrieved and archived. All original Action Request Data Forms are maintained in a chronological logbook for historical purposes. FRMAC Action Request forms may also be used within FRMAC to document requested changes or actions from FRMAC staff, especially those actions that require approval or authorization and need to be distributed to multiple working groups within FRMAC and/or to FRMAC liaisons.



FRMAC ACTION REQUEST

Reference No. _____

Reported By:
Organization _____
Name _____
Date _____ Time _____

Priority _____
1. Emergency
2. Urgent
3. Routine
Authorization _____

NATURE OF REQUEST *(usually handwritten)*

DO NOT WRITE BELOW THIS LINE — FOR FRMAC USE ONLY

FRMAC Response Action Group(s)
Organization _____
Name _____
Date _____ Time _____

FRMAC Priority _____
1. Emergency
2. Urgent
3. Routine
Authorization _____

REPLY/RESOLUTION

Distribution:

For Tracking Use Only
Received By _____
Date/Time _____

Goldenrod (Originator) Pink (File) Green (Response Group) Yellow (Originator Retain) White (FRMAC Retention)

FIGURE 7*. FRMAC ACTION REQUEST*

4.4.2 Setting Overall Priorities

As the need arises, the FRMAC Director will call meetings to review current and future priorities. The overall priorities will be determined by the FRMAC Director, Operations Manager, Coordinating Agency representative(s), and state representative(s). This group will consider the overall FRMAC activities and responsibilities as well as the immediate needs of the Coordinating Agency and the state(s) to protect the public. The group will also decide, on a continuing basis, the overall priorities of the activities. However, implementing and managing FRMAC resources will be determined by management. The group may, as needed, obtain input from the Senior Scientific Advisor (SSA), the Assessment Division Manager, the Advisory Team, the Monitoring and Sampling group, the Laboratory Analysis group, or others within the CM/FRMAC. This group will meet if the requests exceed FRMAC resources. Otherwise, the Operations Manager and the Operations staff will handle the requests.

It is understood that the FRMAC has overall responsibility for monitoring and assessing the off-site radiological situation without being specifically requested by the Coordinating Agency or the state(s).

Appendix B discusses FRMAC products that the Coordinating Agency and the state(s) will receive without specifically requesting them.

4.4.3 Implementation Plan for Priorities

When the overall FRMAC priorities have been established, the Operations Manager will meet with appropriate division Managers to draft the details for implementing priorities and determining impacts on current FRMAC operations. The primary managers will be the Assessment Division Manager and the Monitoring Division Manager. If the impact on the FRMAC is large, the SSA may also be involved. If priorities involve support functions or the health and safety of FRMAC personnel, respective division managers would also be involved. This implementation plan would also contain a time line.

4.4.4 Approval of the Implementation Plan for Priorities

The Operations Manager will meet with the FRMAC Director to approve the plan for implementing operational priorities. The FRMAC Director tasks the appropriate managers to implement priority activities. The Operations Manager and staff will track the activities through the FRMAC and keep a status of the progress.

4.4.5 Technical Data Flow and Priorities

The FRMAC's highest priority is to provide monitoring data and assessment results to the Coordinating Agency, state(s), and local authorities. In the event that a release of radioactivity impacts a large area, the monitoring process will require a significant amount of time to acquire the data. Additional time will also be needed to assess the extent and magnitude of the impact. The goal is to replace the early model-based data used to project initial protective actions with actual monitoring results. A complete discussion of the type of dose assessment products that become available to decision makers and the timeline of when the products become available may be found in the FRMAC Assessment Manual.

Initial monitoring will focus on protecting the public and determining the magnitude, direction, and extent of released radioactivity. (See Appendix H for priorities and strategies for initial monitoring, sampling, and analyzing activities.) Aerial surveys, which will be augmented by ground monitoring, will be utilized for these purposes. These first results are then used to direct a more detailed monitoring effort with inhabited areas receiving first priority unless otherwise directed by the Coordinating Agency and state(s). Finally, the monitoring will be continued until all of the surrounding contaminated area is characterized and impacts assessed.

Figure 8 details the internal information flow of all FRMAC environmental data. Provisions will be made in the information flow to promptly report any monitoring results that represent an immediate threat to public health. All raw data coming into the FRMAC from FRMAC teams are quickly reviewed, stamped as "raw data," and distributed to the Coordinating Agency, state(s), local authorities, and all interested participants within the FRMAC facility. Processed, evaluated, and summarized data from the Assessment group are approved by the FRMAC Director for external

distribution. These evaluated technical data are distributed formally to the Coordinating Agency and state(s) simultaneously.

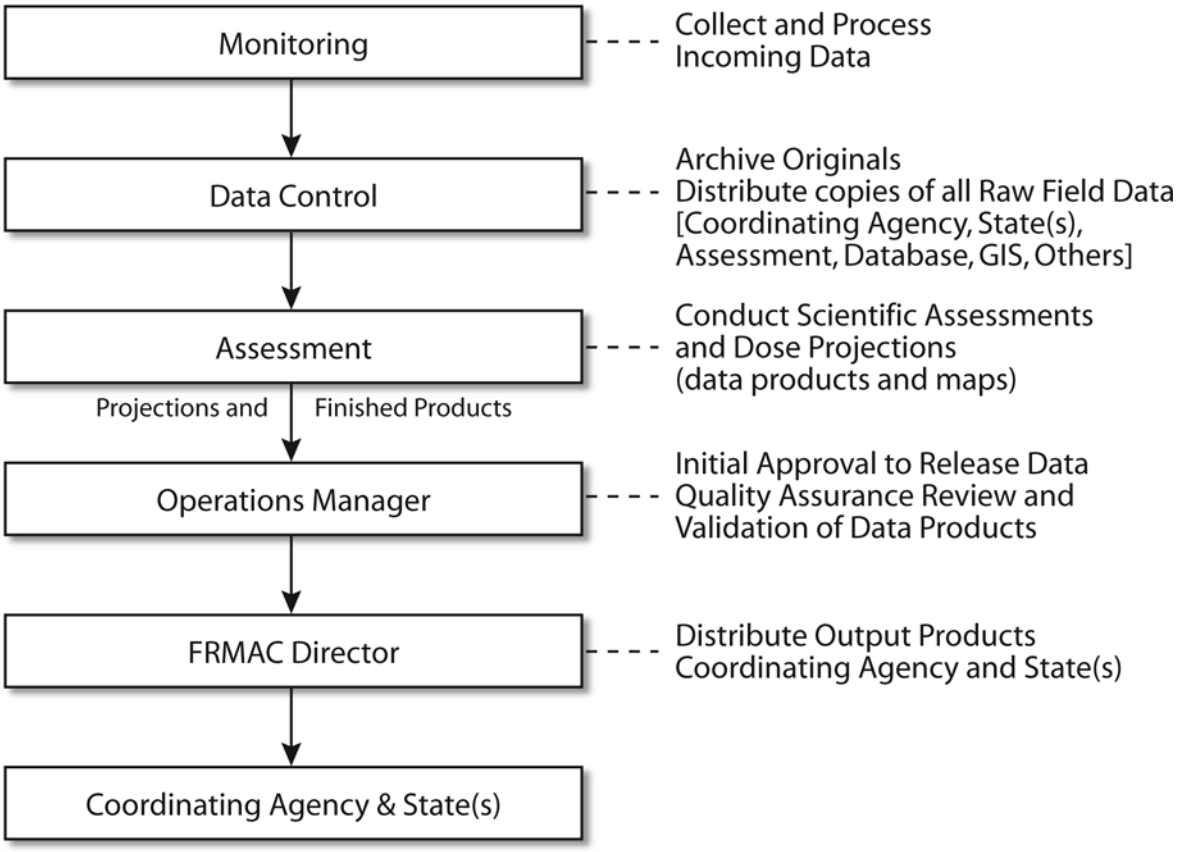


FIGURE 8. ***FRMAC RADIOLOGICAL DATA INFORMATION FLOW***

4.5 Interfacing

4.5.1 U.S. Department of Homeland Security (DHS)

The NRP establishes the Homeland Security Operations Center at DHS headquarters to integrate and provide overall steady-state threat monitoring and situational awareness for domestic incident management on a 24/7 basis. DHS and other Federal agencies listed in the NRP provide representatives at the HSOC.

4.5.2 U.S. Department of Energy (DOE)

During the emergency phase when DOE is managing the FRMAC, the FRMAC will keep NNSA/NSO, the affected DOE Region, and DOE/HQ informed of the status of the emergency; the utilization of DOE/NNSA assets; status of activities; and needs for additional resources, if applicable. Radiological data and results, if requested, will be transmitted to NNSA/NSO, the affected DOE Region, and/or DOE/HQ, when approved for distribution by the Coordinating Agency.

4.5.3 Coordinating Agency

The FRMAC Director will initiate discussions with the Coordinating Agency staff as soon as technical assistance is requested. These discussions will address the conditions and status of the emergency and possible off-site consequences. Once the FRMAC is established, the Coordinating Agency will provide appropriate status updates to the FRMAC through a Coordinating Agency representative located at the FRMAC. The representative will be the primary channel for transmitting the Coordinating Agency off-site monitoring and assessment requirements to the FRMAC and the distribution of the FRMAC's assessed data to the Coordinating Agency.

4.5.4 State(s) and Local Agencies

To facilitate the requests from the state(s) to the FRMAC and the flow of assessed data from the FRMAC to the state(s), liaison personnel will be exchanged. Also, state and local advisors are invited to be incorporated into the FRMAC Director's senior staff as well as the Monitoring, Assessment, Health and Safety, Laboratory Analysis and Support groups. Because of their local and professional knowledge, advisors provide valuable assistance in the efficient and optimal operation of the CM/FRMAC in meeting the requirements of the state(s).

Due to the nature of work and information exchange among the FRMAC elements, designees from the surrounding communities, tribal, county, and local governmental officials, as well as emergency service liaison personnel may be represented in the FRMAC. Also, if requested, the FRMAC will provide liaison representatives to tribal, county, and local emergency operations centers.

4.5.5 U.S. Environmental Protection Agency (EPA)

The EPA will be notified if a FRMAC has been requested for a radiological emergency. The EPA provides a senior representative in the FRMAC to ensure that data collected and recorded in the data center provide the necessary information for long-term re-entry and recovery considerations and can be used as a basis for developing a long-term monitoring plan. Once the emergency is stabilized and at an agreeable time, the EPA Senior Official will assume management of the FRMAC from DOE/NNSA.

4.5.6 Other Agencies

As needed and as requested by the Coordinating Agency, other signatory agencies to the NRP are provided space and support to integrate their activities into the FRMAC operations. Many agencies provide key professionals in technical areas of importance to the FRMAC. Included are specialists in food crops, milk production, water supplies, and critical industries. As full participants in the FRMAC, these agencies become part of the monitoring and assessment technical teams to ensure that their areas of concern are addressed. These federal agencies may include the EPA, NRC, DoD, USDA, HHS, National Oceanic and Atmospheric Administration (NOAA), and others as needed. The responsible facility operator may also be represented at the FRMAC to provide updates on facility status.

5.0 TRANSFER OF FRMAC MANAGEMENT FROM DOE/NNSA TO EPA

5.1 Introduction

The NRP states that DOE/NNSA will transfer responsibility for managing the FRMAC to EPA at a mutually agreeable time after consulting with the Coordinating Agency and state(s). This section discusses the processes and conditions by which this transfer will take place.

5.2 Transfer Requirements

The DOE/NNSA FRMAC Director will work closely with the Senior EPA Official to facilitate a smooth transfer of the Federal radiological monitoring and assessment coordination responsibility to EPA at a mutually agreeable time and after consultation with their respective headquarters offices, the states, and the Coordinating Agency. Although it is difficult to specify in advance when the transfer of this coordination responsibility would occur, certain conditions are intended to be met prior to this transfer. These conditions include the following:

1. The immediate emergency condition is stabilized.
2. Off-site release of radioactive material has ceased, and there is little or no potential for further unintentional off-site releases. This will be verified by the Senior EPA Official with the Coordinating Agency, the FRMAC Director, and the party responsible for the incident (e.g., the utility if a nuclear power plant accident).
3. The off-site radiological conditions have been characterized and the immediate consequences have been addressed. The EPA Dose Assessment Manager will verify with the DOE FRMAC Assessment Manager that all data has been documented according to FRMAC archival procedures and this record is presented to and is satisfactory with EPA.
4. An initial or draft long-range monitoring plan has been developed in conjunction with the affected states and appropriate Federal agencies. Development of the long-range plan would begin during the later portion of the emergency phase response.
5. The EPA has received adequate assurances from the other Federal agencies that they will commit the required resources, personnel, and funds for the duration of the Federal response.

After these conditions are met and a formal document is signed, the EPA will assume the Federal agency responsibility for coordinating the intermediate and long-term off-site radiological monitoring, sampling, and assessment activities. When this occurs, DOE and other Federal agencies will continue to commit the equipment, personnel, and funds for the duration of the Federal response effort as necessary.

After transfer, the EPA FRMAC Director will work with whatever cleanup group (Site Restoration Working Group, Decontamination Committee, etc.) is in charge of overall cleanup. The FRMAC will continue to provide monitoring data for cleanups as well as keep re-assessing problem areas.

In time, the EPA-led FRMAC will scale down into a smaller EPA and EPA-contractor entity. This will include relocating out of the original FRMAC location and establishing whatever near-site

facility is necessary to accomplish the monitoring mission. EPA plans to terminate its near-site monitoring effort with the concurrence of the EPA Science Advisory Board. The organization of the post-emergency FRMAC is presented in Figure 9.

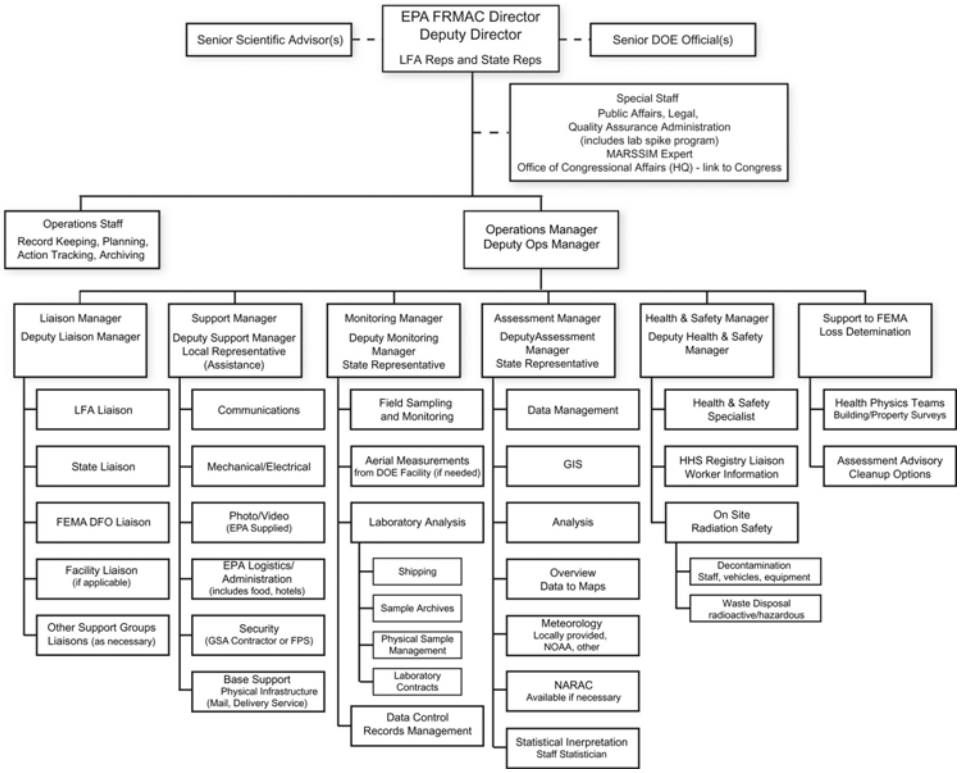


FIGURE 9. ***POST EMERGENCY FRMAC ORGANIZATION (SET UP AFTER TRANSFER)***

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APPENDIX A

RESPONSIBILITIES OF COORDINATING AND COOPERATING AGENCIES

The following descriptions are summaries of the response missions and capabilities and resources of the signatory Agencies. A full discussion can be found in the *Nuclear/Radiological Incident Annex* to the *National Response Plan* (December 2004).

American Red Cross	Assesses the mass care consequences of a radiological incident, and in conjunction with state, local, and tribal (including private-sector) mass care organizations, develop and implement a sustainable short-term and long-term strategy for effectively addressing the consequences of the incident.
U.S. Department of Agriculture	▪ Inspects meat and meat products, poultry and poultry products, and egg products identified for interstate and foreign commerce to ensure that they are safe for human consumption. ▪ Assists HHS in monitoring the production, processing, storage, and distribution of food. ▪ Collects agricultural samples within the Ingestion Exposure Pathway Emergency Planning Zone (through the FRMAC). ▪ Assists in the evaluation and assessment of data to determine the impact of the incident on agriculture.
U.S. Department of Commerce	▪ Prepares operational weather forecasts tailored to support activities. ▪ Prepares predictions of plume trajectories, dispersion, and deposition. ▪ Archives meteorological data from national systems applicable to the monitoring and assessment of the response. ▪ Ensures safety of marine fishery products. ▪ Provides assistance and reference material for calibrating radiological instruments.
U.S. Department of Defense	Serves as a Coordinating Agency, as identified in Table 1, coordinating Federal actions for radiological incidents involving DoD facilities, including U.S. nuclear-powered ships, or material otherwise under their jurisdiction. ▪ Provides Defense Support of Civil Authorities (DSCA) in response to requests for assistance during domestic incidents. ▪ Provides Immediate Response Authority under imminently serious conditions resulting from any civil emergency that may require immediate action to save lives, prevent human suffering, or mitigate great property damage.
U.S. Department of Defense/U.S. Army Corps of Engineers	▪ Directs response/recovery actions as they relate to functions detailed in the Public Works and Engineering Annex to the National Response Plan, including contaminated debris management. ▪ For RRD/IND incidents, provides response and cleanup support as a cooperating agency. ▪ Integrates and coordinates with other agencies, as requested, to perform any or all of the following: radiological survey functions; gross decontamination; site characterization; contaminated water management; and site remediation.

U.S. Department of Energy	Serves and a Coordinating Agency, as identified in Table 1, coordinating Federal actions for radiological incidents involving DOE facilities or material otherwise under their jurisdiction. ▪ Coordinates Federal offsite radiological environmental monitoring and assessment activities as lead technical organization in FRMAC (Phase 1), regardless of who is designated the Coordinating Agency. ▪ Maintains technical liaison with state and local agencies with monitoring and assessment responsibilities. ▪ Maintains a common set of all offsite radiological monitoring data in an accountable, secure, and retrievable form and ensures the technical integrity of FRMAC data. ▪ Provides monitoring data and interpretations, including exposure rate contours, dose projections, and any other requested radiological assessments, to the Coordinating Agency and to the States. ▪ Provides, in cooperation with other Federal agencies, the personnel and equipment to perform radiological monitoring and assessment activities, and provides on-scene analytical capability supporting assessments. ▪ Requests supplemental assistance and technical support from other Federal agencies as needed. ▪ Works closely with the Senior EPA representative to facilitate a smooth transition of the Federal radiological monitoring and assessment coordination responsibility to EPA at a mutually agreeable time and after consultation with the States and Coordinating Agency. ▪ Provides, in cooperation with other Federal and state agencies, personnel and equipment, including portal monitors, to support initial external screening and provides advice and assistance to state and local personnel conducting screening/decontamination of persons leaving a contaminated zone. ▪ Provides plume trajectories and deposition projections for emergency response planning assessments, including source term estimates, where limited or no information is available, including INDs and RRD, to the IMAAC and/or Coordinating Agency, in accordance with established procedures. ▪ Upgrades, maintains, coordinates, and publishes documentation needed for the administration, implementation, operation, and standardization of the FRMAC. ▪ Maintains and improves the ability to provide wide-area radiation monitoring now resident in the AMS. ▪ Maintains and improves the ability to provide medical assistance, advisory teams, and training related to nuclear/radiological accidents and incidents now resident in the REAC/TS. ▪ Maintains and improves the ability to provide near-real time assessments of the consequences of accidental or potential radiation releases by modeling the movement of hazardous plumes, and to correct modeled results through integration of actual radiation measurements obtained from both airborne and ground sources, resident in the NARAC. The NARAC also maintains and improves their ability to model the direct results (blast, thermal, radiation, EMP) of a nuclear detonation.

U.S. Department of Health and Human Services	▪ In conjunction with USDA, inspects production, processing, storage, and distribution facilities for human food and animal feeds that may be used in interstate commerce to ensure protection of public health. ▪ Collects samples of agricultural products to monitor and assess the extent of contamination as a basis for recommending or implementing protective actions (through the FRMAC). ▪ Provides advice on proper medical treatment of the general population and response workers exposed to or contaminated by radioactive materials.
U.S. Department of Homeland Security/Emergency Preparedness and Response/Federal Emergency Management Agency	▪ In consultation with the Coordinating Agency, coordinates the provision of Federal resources and assistance to affected state, local, and tribal governments under the Stafford Act or Federal-to-Federal support provisions of the NRP. ▪ Monitors the status of the Federal response to requests for assistance from the state(s) and provides this information to the state(s). ▪ Keeps the Coordinating Agency informed of requests for assistance from the state(s) and the status of the Federal response. ▪ Identifies and informs Federal agencies of actual or apparent omissions, redundancies, or conflicts in response activity. ▪ Establishes and maintains a source of integrated, coordinated information about the status of all nonradiological resource support activities. ▪ Provides other support to Federal agencies responding to the emergency.
U.S. Department of Homeland Security/U.S. Coast Guard	Serves as Coordinating Agency for incidents that occur in certain areas of the coastal zone, as identified in Table 1.
U.S. Department of Housing and Urban Development	▪ Reviews and reports on available housing for disaster victims and displaced persons. ▪ Assists in planning for and placing homeless victims in available housing. ▪ Provides staff to support emergency housing within available resources. ▪ Provides housing assistance and advisory personnel.
U.S. Department of the Interior	Advises and assists in assessing and dealing with impacts to natural resources, including fish and wildlife, subsistence uses, public lands, Indian tribal lands, land reclamation, mining, minerals, and water resources.
U.S. Department of Justice/Federal Bureau of Investigation	Coordinates all law enforcement and criminal investigative responses to acts of terrorism, to include intelligence gathering, hostage negotiations, and tactical operations.
U.S. Department of Labor/Occupational Safety and Health Administration	Provides advice and assistance to DHS, the Coordinating Agency, and state, local, and tribal governments concerning the health and safety of response workers implementing the policies and concepts in the Nuc Rad Annex.
U.S. Department of State	▪ Coordinates foreign information-gathering activities and all contacts with foreign governments, except in cases where existing bi-lateral agreements permit direct agency-to-agency cooperation. ▪ Conveys the U.S. Government response to foreign offers of assistance.

U.S. Department of Transportation	Can assist Federal, state, and local governments with emergency transportation needs and contribute to the response by assisting with the control and protection of transportation near the area of the emergency.
U.S. Department of Veterans Affairs	Can assist other Federal agencies, state, and local governments, and individuals, in an emergency by providing immediate and long-term medical care, including management of radiation trauma, as well as first aid, at its facilities or elsewhere.
Environmental Protection Agency	Serves as a Coordinating Agency, as identified in Table 1. ▪ Provides resources, including personnel, equipment, and laboratory support (including mobile laboratories) to assist DOE in monitoring radioactivity levels in the environment. ▪ Assumes coordination of Federal radiological monitoring and assessment responsibilities after the transition from DOE. ▪ Assists in the development and implementation of a long-term monitoring plan and long-term recovery plan. ▪ Provides nationwide environmental monitoring data from the Environmental Radiation Ambient Monitoring Systems for assessing the national impact of the incident. ▪ Develops Protective Action Guides in coordination with the FRPCC. ▪ Recommends protective actions and other radiation protection measures. ▪ Recommends acceptable emergency levels of radioactivity and radiation in the environment. ▪ Prepares health and safety advice and information for the public. ▪ Estimates effects of radioactive releases on human health and the environment. ▪ Provides response and recovery actions to prevent, minimize, or mitigate a threat to public health, safety, or the environment caused by actual or potential releases of radioactive substances, including actions to detect, identify, contain, clean up, and dispose of such substances. ▪ Assists and support the NIRT, when activated. ▪ Provides, in cooperation with other Federal agencies, the law enforcement personnel and equipment to conduct law enforcement operations and investigations for nuclear/radiological incidents involving criminal activity that are not terrorism related.
General Services Administration	▪ Provides acquisition and procurement of floor space, telecommunications and automated data processing services, transportation, supplies, equipment, and material. ▪ Provides contracted advisory and support services to Federal agencies and provides security services on Federal property leased by, or under control of, GSA.
National Aeronautics and Space Administration	Serves as a Coordinating Agency, as identified in Table 1.
Nuclear Regulatory Commission	Serves as a Coordinating Agency, as identified in Table 1. ▪ Provides technical assistance to include source term estimation, plume dispersion, and dose assessment calculations. ▪ Provides assistance and recommendations concerning protective action measures as Coordinating Agency. ▪ Provides assistance in Federal radiological monitoring and assessment activities.

APPENDIX B

FRMAC DATA OUTPUT PRODUCTS

Without a specific request for information, the Coordinating Agency, state(s), and local authorities can expect that the Federal Radiological Monitoring and Assessment Center (FRMAC) will work toward producing the generic products listed in the following sections. The majority of these products will be produced within the FRMAC by the Assessment group. They will be presented with some perspective on the radiological situation, as known at the time, in a form readily understandable to managers and decision makers.

B.1 Plume Dispersion and Dose Projections

The Lawrence Livermore National Laboratory's National Atmospheric Release Advisory Center (NARAC) or Sandia National Laboratories/New Mexico Consequence Predictions group will provide plume, deposition, and dose projection modeling (Sample plots are shown in Figures B-1 through B-4). Signatory agencies to the National Response Plan (NRP), i.e., U.S. Department of Commerce (DOC) and National Oceanic and Atmospheric Administration (NOAA), will provide a wide variety of meteorological data and forecasts. NARAC predictions will supplement those made by the facility operator, Coordinating Agency, state(s), DOC, and other federal agencies. Projections will be revised as verified field measurement data become available.

B.2 Aerial Survey Data

The first Aerial Measuring System (AMS) mission would likely be performed by flying a DOE/NNSA fixed-wing aircraft in a serpentine pattern to cover the entire deposition area expeditiously (Sample deposition map shown in Appendix C, Figure C-2). The results of this first mission are expected to identify the extent of the measurable contamination in both width and length, the major isotopes contributing to the aerial results, and an estimated level of contamination (exposure rates and/or isotope concentrations).

Later missions will involve more detailed surveys. Each aerial mission is expected to take from two to three hours, with the results available one to three hours after a mission is completed. These results will be reviewed and issued to the Coordinating Agency, state(s), and local authorities as soon as possible after the completion of each survey mission. AMS flights may involve the use of both helicopter and fixed-wing aircraft utilizing large sodium iodide gamma detectors. Sensitivities are such that small changes in background can be detected.

B.3 Reviewed Raw Data

Ground-based radiation data (including exposure rates, sampling results, and isotopic concentrations of deposited activity) will be reviewed by the Monitoring group, stamped “raw data,” and provided to the Coordinating Agency, state(s), and local authorities within the FRMAC facilities. Specific data points (required by the Coordinating Agency, state(s), or other agencies) may be needed, particularly in the initial stages of an emergency when complete data are unavailable. These reviewed raw data will be screened for complete information such as times, locations, units, exponents, and instruments used. The review will also provide some assurance of consistency within the product since it is reviewed against current knowledge of the overall radiological situation. Reviewed raw data may also include data from samples of water, air particulates and reactive gases, soil, vegetation, food products, and any other sample media consistent with potential health hazards.

B.4 Summarized Data

Environmental radiation data from field teams and laboratories will be entered into a database for both short-term and long-term storage and retrieval. As required, the data can be condensed and summarized to show the radiation situation in specific areas or to correlate sample media from different types of surveys. For example, a summarized data sheet could be generated to show all of the external exposure rate data taken in certain sectors, districts, or population areas over a given time period.

B.5 Exposure Rate and/or Contamination Contours

The FRMAC provides radiation contours showing where the contamination is located and the associated radiation levels. Initially, projections of radiation patterns from radiological dispersion models are likely to be the only ones available. As environmental surveys are conducted, these contours will be refined or changed to be consistent with data from actual measurements. It is anticipated that contamination contours will be updated every few hours to represent the latest information received in the FRMAC. The contour levels may be in exposure rates or isotopic concentrations, depending on the type of emergency and preferences of the Coordinating Agency, state(s), and local authorities.

B.6 Dose Projections from Actual Measurements

Once enough data points are available, more realistic projections of doses to individuals and/or groups of individuals can be produced. The contour levels will include those applicable to the PAGs, as well as any other levels of interest. For example, it may be appropriate to produce contours of the projected four-day, one-month, first-year, second-year, and 50-year whole-body dose equivalent from external and internal radiation (total effective dose equivalent) for outdoor locations and/or for sheltered locations. A variety of assumptions of modifying factors may be included in these dose projections including, but not limited to, weathering, re-suspension, structure shielding, and occupancy rates. The FRMAC dose projections will be as realistic as possible using reasonable

assumptions and transfer values consistent with the uncertainties involved. Such assumptions will be documented or their sources referenced and included with the assessments.

B.7 FRMAC Data Center

All of the environmental radiological data acquired by or furnished to the FRMAC will be stored in the FRMAC Data Center. It will be comprehensive because it is intended to include every off-site environmental radiological data point. Every data point acquired by FRMAC will be traced to an individual instrument, survey team, calibration, and procedure. The long-term design objectives of the Data Center are to (1) build a comprehensive compilation of all environmental radiological data for long-term retention and use by the U.S Environmental Protection Agency, the Coordinating Agency, state(s), and local authorities and (2) archive all information to reconstruct knowledge of the radiological situation some time in the future.

B.8 Geographic Information System (GIS) Products

The GIS is a computerized database management system which provides for the capture, storage, retrieval, analysis, and display of spatial (defined by location) data. By having layers of information displayed on a computer screen and/or map, a person can see the relationship of one piece of information to another. The GIS database also allows for attributes of a given piece of data to be easily referenced. For example, a specific school can be located on a map and applicable information about that school can be extracted using the database. The GIS can also calculate areas of interest. For example, a land-use data layer can be overlaid onto a radiation plot to calculate the area of a given type of land use that lies within a certain radiation zone.

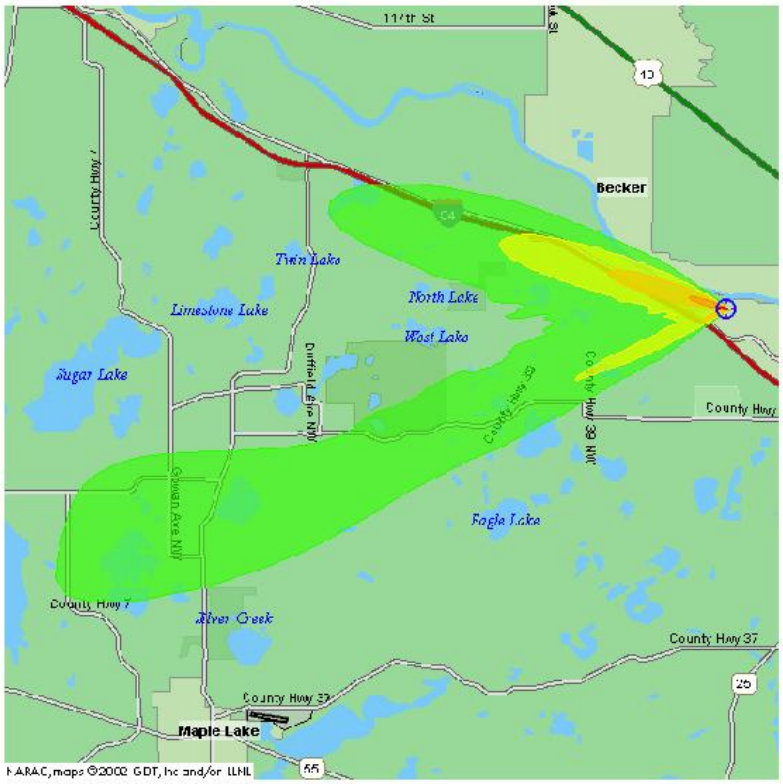
Layers of information within the GIS may include: (1) geographic base data, (2) administrative data, (3) emergency response data, (4) land cover/land use, (5) critical industries, (6) radiation data, (7) dispersion model output, and (8) image data. These GIS layers may include locations of evacuation routes, police and fire stations, hospitals and clinics, operations centers, shelters, and institutions (schools, prisons, and nursing homes). Radiation data could include baseline background levels, environmental thermoluminescent dosimeter locations, continuous location of survey teams, AMS data, location of measurements and samples by type, exposure rate contours, integrated one-year dose projection contours, and isotopic concentration contours by dominant isotope.

B.9 Tailored Format for Users

The FRMAC will present the off-site environmental radiological data to the Coordinating Agency, state(s), and local authorities in a recognizable and usable format and in a manner understandable by managers and decision makers. Whenever possible, there will be presentation-quality graphics (both hard copies and transparencies [MS PowerPoint]) that summarize data and impacts. Discrete data will be prepared in a clear, concise form, organized specifically for a particular purpose. Radiation levels in commonly used units and/or in values relative to recognizable PAG levels will be used. Where possible, plotted or contoured radiation levels will be displayed in standard FRMAC color schemes. Information transmitted by fax, GIS, or still video will be produced in an easily readable and concise format with sufficient information to properly present the required data. Whenever possible, the provided information will be tailored to meet the purposes of the intended users.

Planning Set 3: 4-Day TEDE

Planning Set 3: TEDE, Thyroid Dose, Gnd Exp Dose Rate
rcC7712 - unknown



Effects or contamination from 18 Nov 2003 14:30 UTC to 22 Nov 2003 14:3

Consequences and Actions			
	(Rem) Area Extent	Population	Description
	>100 0.008 km2 n/a	1 n/a	Serious health effects. Evac. req. Respiratory protection/sheltering req.
	>25 0.1 km2 n/a	3 n/a	EPA emerg. worker limit for lifesaving activities. Increased cancer risk.
	>5.0 1.1 km2 n/a	121 n/a	EPA early phase upper limit PAG for evacuation.
	>1.0 6.1 km2 n/a	578 n/a	EPA early phase PAG for considering evacuation.
	>0.1 57.2 km2 n/a	1,870 n/a	10% of EPA early phase PAG for considering evacuation.
Note: Areas and counts in the table are cumulative.			

Source Location: 45.333333 N, 93.848333 W
Material: Nuclide mix
Comments: Time-varying release rates.
Time-varying canned metdata
including rain.
Not For Public Dissemination

Map Size: 20.55 km by 20.55 km **Id:** Production.rcE7738.rcC7712
NARAC Operations: narac@llnl.gov; (925) 424-6465
Requested by: (; unknown)
Not approved for further distribution

FIGURE B-1. ***INITIAL NARAC PLOT***

This is an initial plot that is produced by NARAC. It can be available within 15 minutes to one hour after notification.

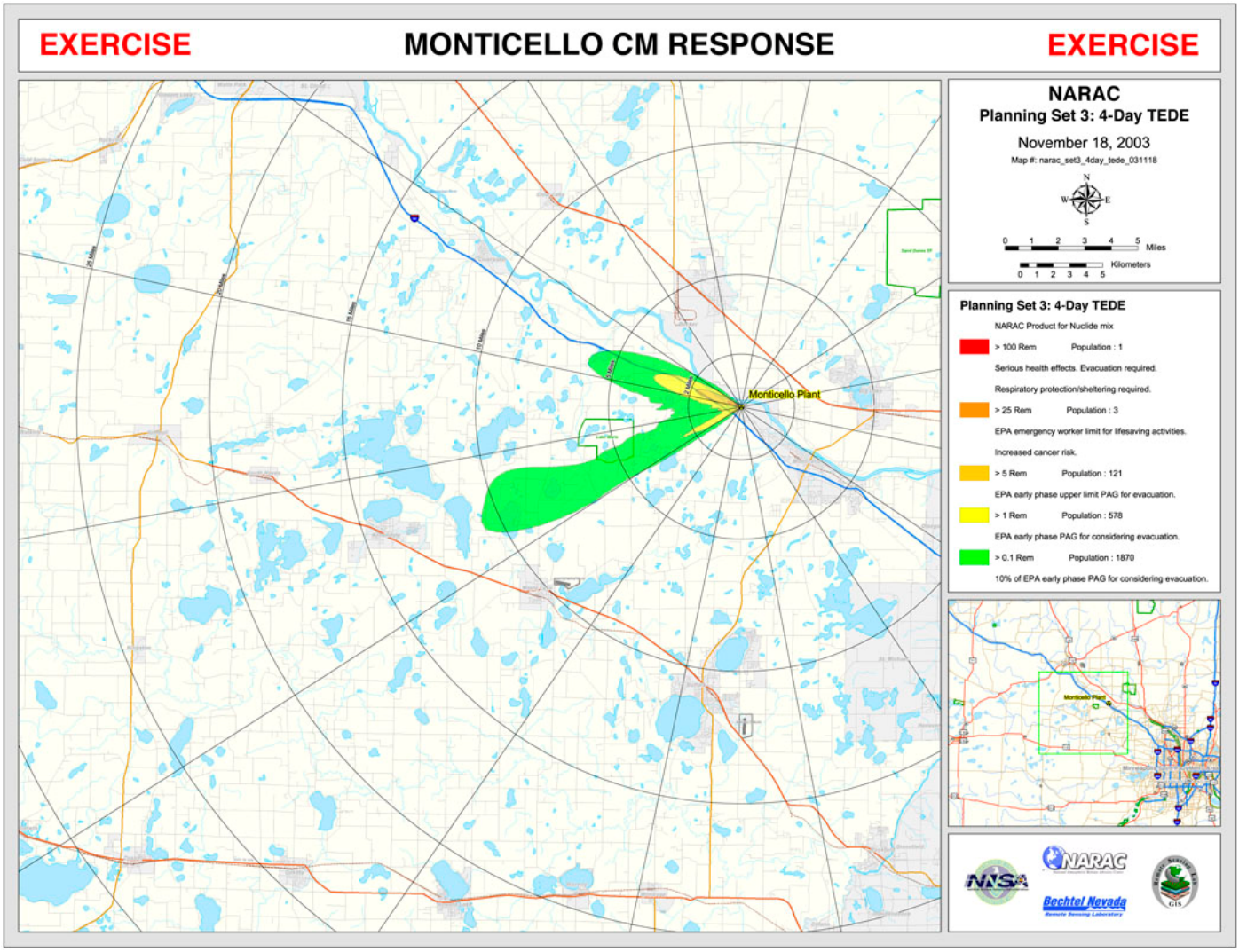


FIGURE B-2. ***RELOCATION PAG ZONE MAP***

This is a FRMAC GIS product using NARAC-generated simulations. The above map indicates contour levels associated with the EPA evacuation guidelines.

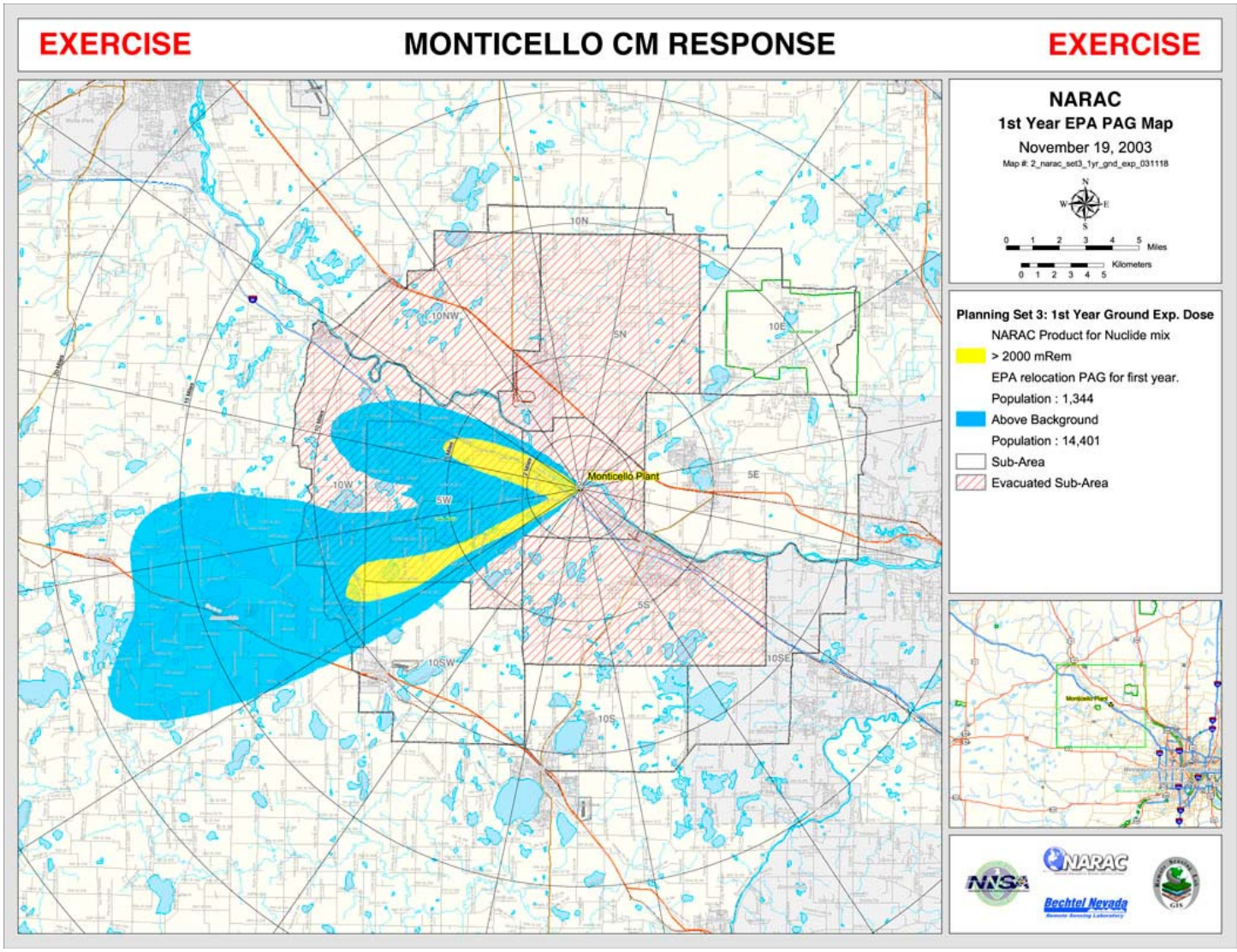


FIGURE B-3. ***FIRST YEAR EPA PAG MAP***

This is a FRMAC GIS product indicating an area where the EPA relocation guideline may be exceeded. The cross-hatched regions illustrate areas that have been evacuated by local and state officials.

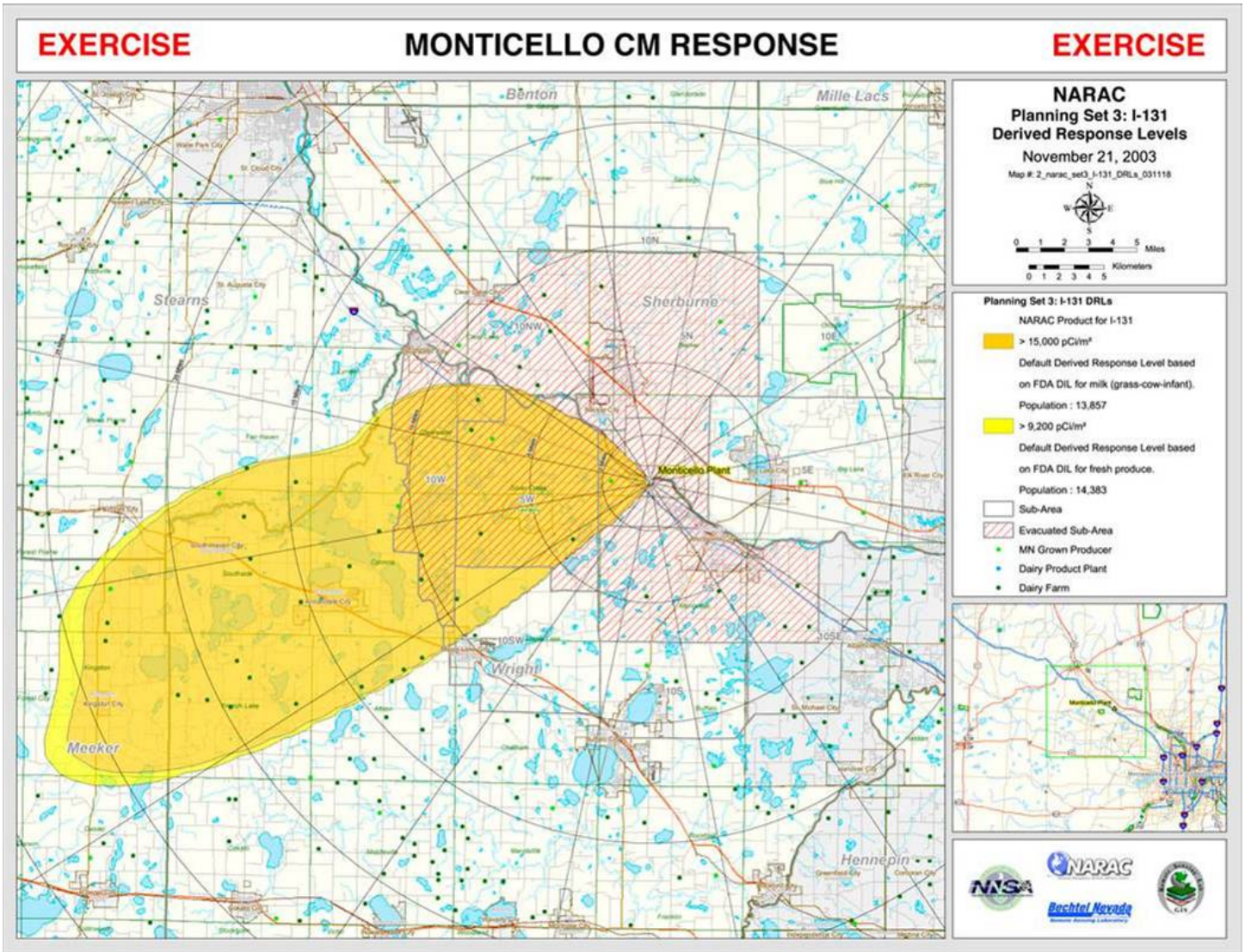


FIGURE B-4. ***DERIVED RESPONSE LEVELS***

This map indicates areas where I-131 levels may have surpassed FDA guidelines. Also shown on the map are areas where dairy products and produce are grown. Similar maps can be generated for other isotopes of interest.

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APPENDIX C

AERIAL MEASURING SYSTEM (AMS)

C.1 Introduction

The AMS is a key element of the NNSA Nevada Site Office (NNSA/NSO) response to a large radiological incident. Large areas can be surveyed quickly to assist the Coordinating Agency and the state(s) in determining the impact of the emergency. The AMS assets, which are operated and maintained by the NNSA/NSO Remote Sensing Laboratory (RSL), are located at Nellis Air Force Base (AFB) in Las Vegas, Nevada, and at Andrews AFB near Washington, D.C.

C.2 Activation

Before the deployment of the AMS assets, authorization for their release must be approved by DOE Headquarters (DOE/HQ). This authorization is initiated by a request for assistance from the Coordinating Agency or the state(s) through the Department of Homeland Security (DHS), or from other DOE Emergency Response Groups to the DOE/HQ Emergency Operations Center. Until CM/FRMAC arrives on scene, the Radiological Assistance Program (RAP) Team Leader at the scene will contact and coordinate the AMS flights with the Coordinating Agency, state(s), and local authorities at the scene.

C.3 Capabilities

AMS-equipped, fixed-wing aircraft are instrument rated, and capable of all-weather operation. Fixed-wing aircraft operate at altitudes as low as 152 meters (500 feet) above ground level and as high as the aircraft's operational ceiling, which is approximately 16,700 meters (35,000 feet) mean sea level. Dependent upon flight conditions, the fixed-wing aircraft's optimum flying time is 5 hours.

Standard instrumentation includes:

- Three sodium iodide detectors (one 2-inch by 4-inch by 16-inch, one 2-inch by 4-inch by 4-inch, and one 1-inch by 1-inch diameter)
- Survey meters for crew dose monitoring and contamination surveys
- Recording equipment
- Radar altitude
- Autonomous Global Positioning System (GPS) position tracking equipment
- Direct readout hardware
- Data analysis equipment
- Data telemetry equipment

The data are partially analyzed on board and are stored on hard disk for detailed analysis upon landing.

AMS-equipped helicopters operate only under Federal Aviation Administration visual flight rules and will not be deployed during poor weather conditions. Helicopters operate at altitudes as low as 30 meters (100 feet) above ground level, but their actual operational altitudes will be dictated by flight safety concerns. Dependent upon flight conditions, the helicopter's optimum flying time is 2–3 hours. Standard instrumentation includes twelve 2-inch by 4-inch by 16-inch sodium iodide thallium-activated (NaI[*T*l]) detectors, data formatting and recording equipment, radar altitude and differential GPS position tracking equipment, direct readout hardware, and data analysis equipment. The data are partially analyzed on board and are stored on hard disk for detailed analysis upon landing.

Dependent upon the mission objectives, a precision optical camera, a thermal infrared scanner, and other radiation detectors could also be mounted on the aircraft.

C.4 Missions

An initial AMS flight can be made by one fixed-wing aircraft to rapidly, but coarsely, map the residual fallout pattern and intensity of contaminated debris or material that may have been deposited after passage of the radioactive air mass or cloud. The AMS-equipped aircraft will fly a serpentine pattern (Figure C-1) of flight lines that will encompass a 10-mile radius around the incident site and the entire area suspected of being contaminated. During the flight, cursory radiological data such as peak exposure rates will be sent by satellite to the AMS ground control. The initial mapping flight will normally be limited to daylight hours. However, nighttime flights will be considered on a case-by-case basis. Mission deliverables are:

- Color-coded plot map of inferred exposure rate (exposure rate footprint) along serpentine flight path.
- General meteorological conditions.

After the initial broad survey, detailed radiological surveys will be performed to measure and map the extent of the residual fallout deposition, determine the average surface area exposure rate, and identify the specific radionuclides responsible for the contamination and their relative intensities.

Normally, to perform an aerial radiological survey of an area, the AMS-equipped aircraft must fly a series of parallel flight lines at as low an altitude and ground speed as can be safely achieved (Figure C-2).

For the fixed-wing system, the nominal survey altitude is 305 meters (1,000 feet) above ground level with a flight line spacing of 305 meters (1,000 feet) at a ground speed of 72 meters per second (140 knots). For the helicopter system, the nominal survey altitude is 46 meters (150 feet) above ground level with a flight line spacing of 76 meters (250 feet) at a ground speed of 36 meters per second (70 knots). The preferred aerial platform for performing a detailed aerial survey is the helicopter because of its larger-volume NaI[*T*l] detector array, lower flying altitude, and greater spatial resolution.

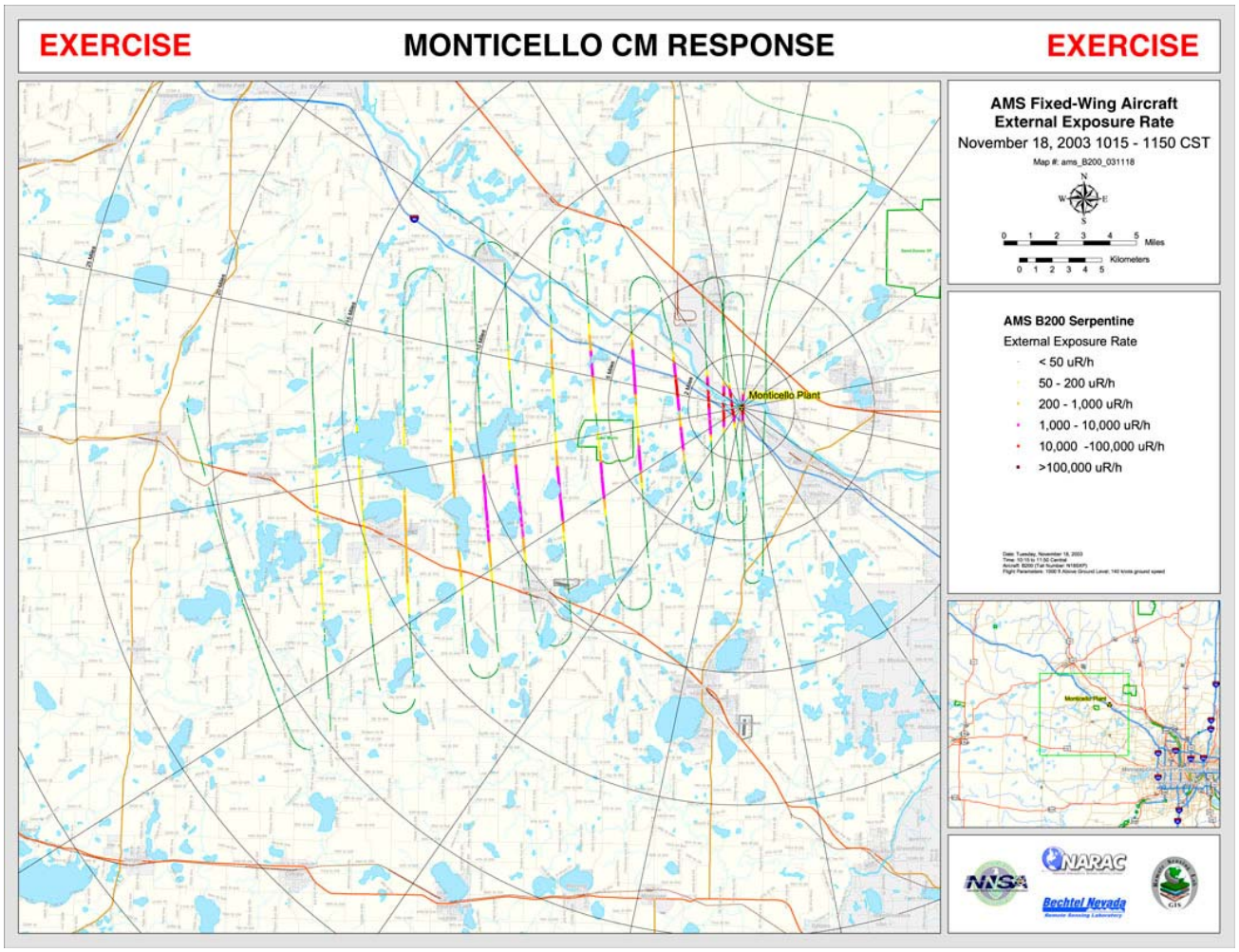

FIGURE C-1. ***SERPENTINE FLIGHT PATTERNS (EXPOSURE RATES)***

AMS fixed wing serpentine flight. Colors of data points indicate the magnitude of the exposure rate at ground level.

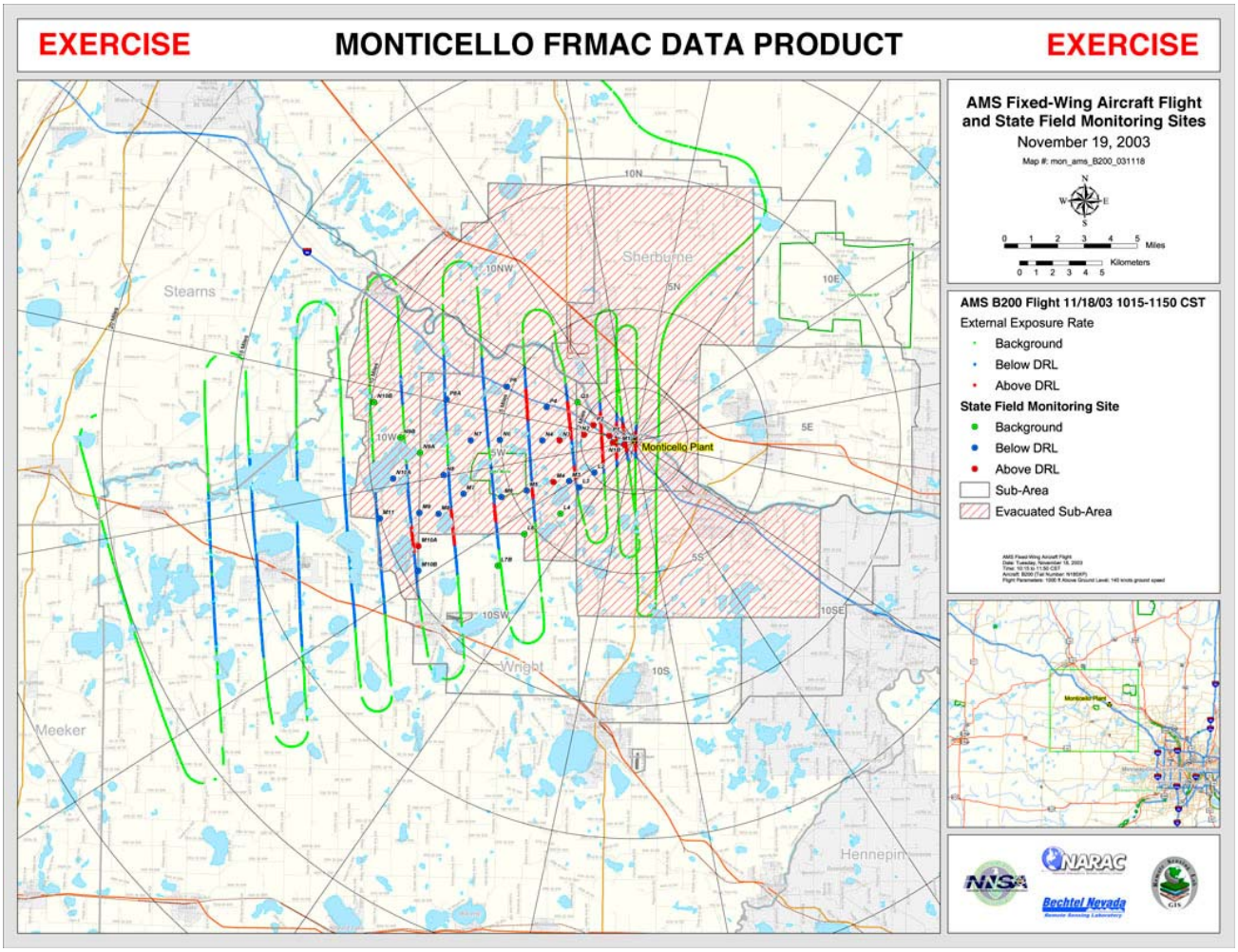

FIGURE C-2. ***SERPENTINE FLIGHT PATTERNS (FIELD MONITORING SITES)***

AMS fixed wing serpentine map. This map has been produced specifically for decision makers. The colors of the data points indicate how they compare to Federal guidelines. Also represented on the map are the locations where field teams have collected data.

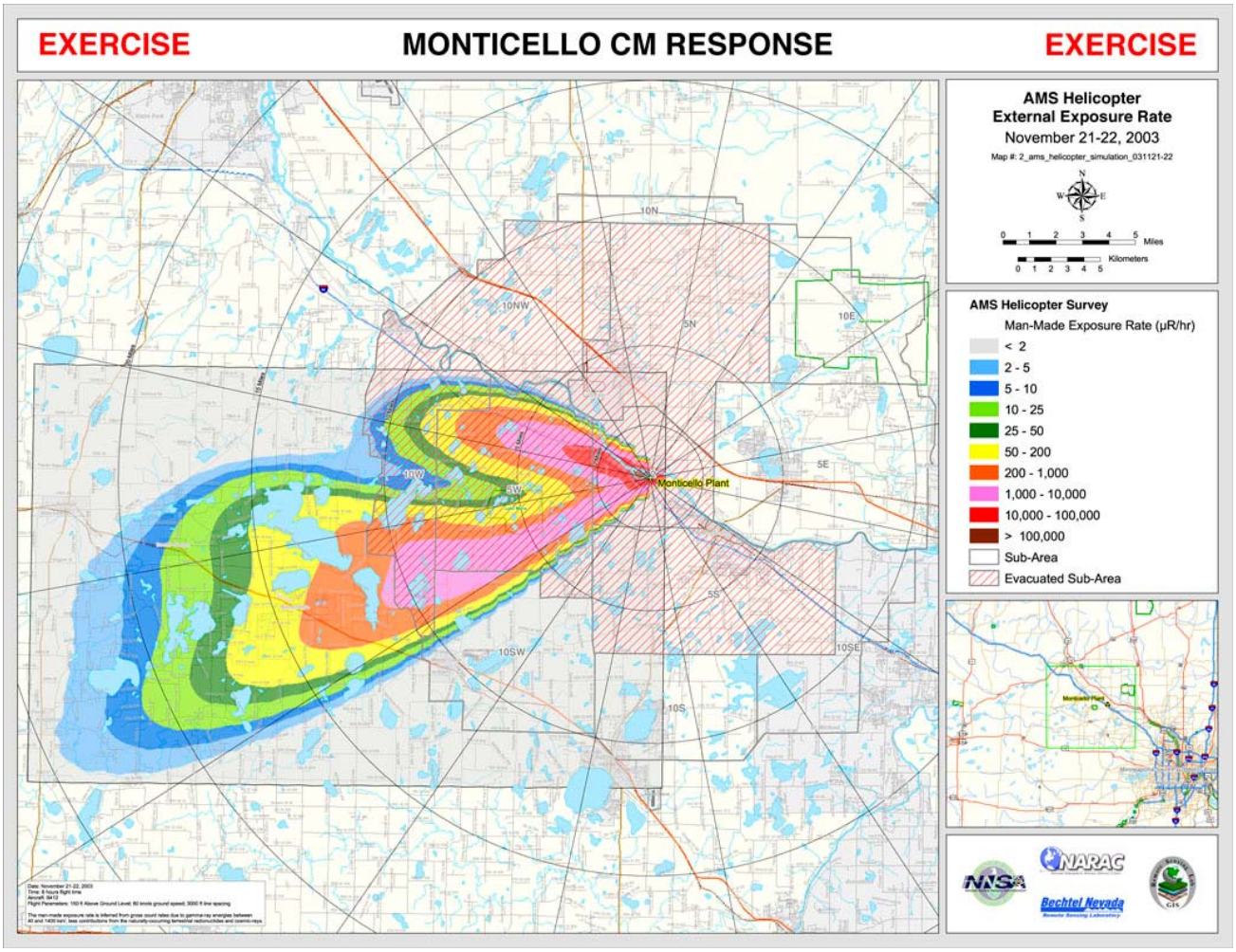

FIGURE C-3. ***AMS HELICOPER SURVEY***

AMS helicopter map. The contours indicate the ground level exposure rates.

Flying at an altitude of 46 meters (150 feet) will provide a ground monitoring window (field of view) of approximately 92 meters (300 feet) in width. In this manner, the helicopter can map the ground deposition at a rate of about 10 square kilometers per hour (4 square miles per hour). The radiological survey flights are normally limited to daylight hours. However, nighttime flights will be considered on a case-by-case basis.

After each survey flight, detailed data analysis is performed with the computer analysis equipment on site. The data processing time required to complete each set of flight data is approximately 1-3 hours. Completed survey deliverables are:

- Contour map of inferred exposure rate at one meter above ground level
- Contour map(s) of specific isotope surface area activity
- Identification and magnitude of dominant isotopes (gamma energy spectra)

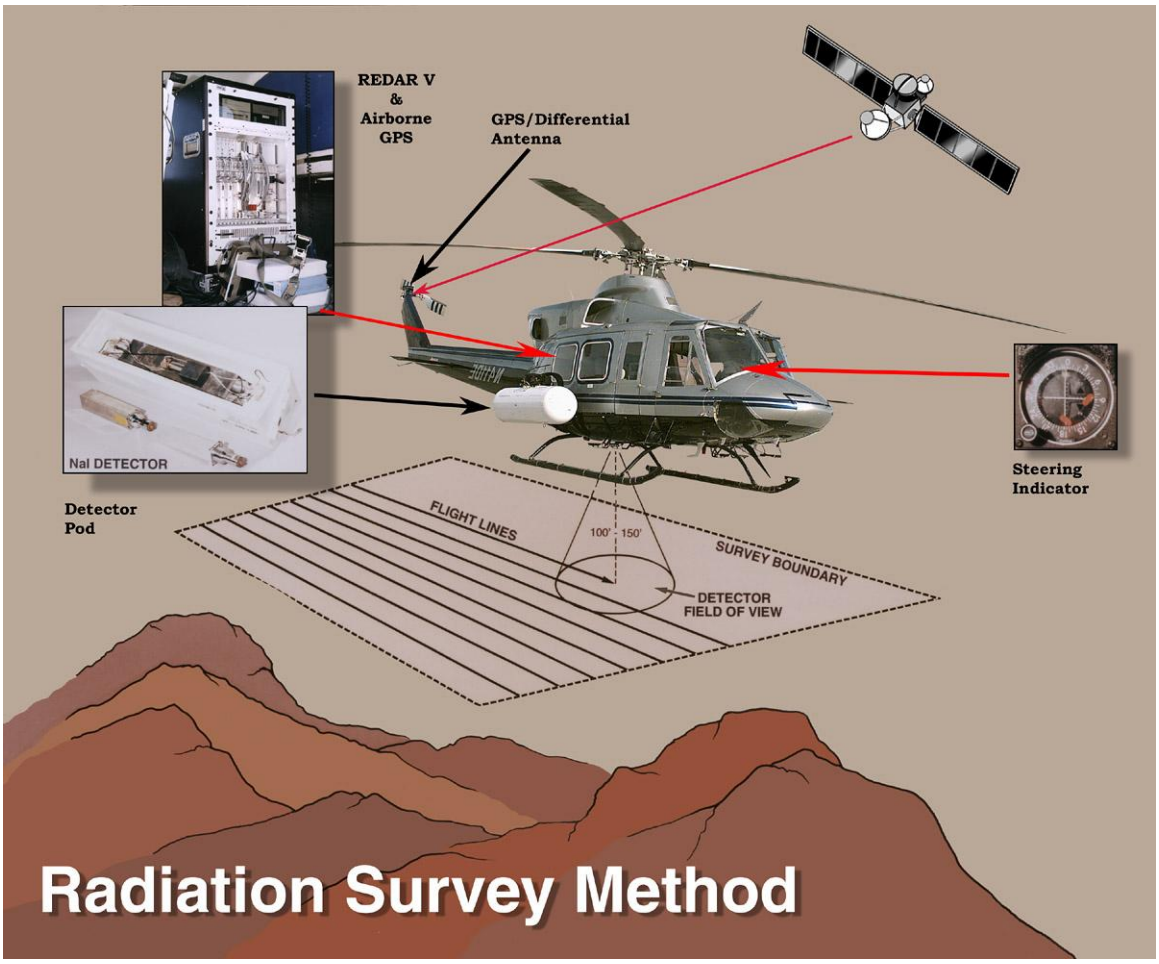

FIGURE C-4. ***TYPICAL AERIAL RADIOLOGICAL SURVEY SETUP***

C.5 Aerial Radiological Survey Sensitivities

The minimum detectable activity limits of the AMS aerial platforms for a typical radiological survey are shown in Table C-1. Sensitivity values are given for typical isotopes in units of microcuries per square meter ($\mu Ci/m^2$), assumed to be surface deposition with no mixture in the soil. Detection sensitivities will vary, depending upon altitudes flown, line spacing, deposition variability, and analysis processing.

Table C-1. AMS Minimum Detectable Activities

Radionuclide	Photopeak Energy (kiloelectron Volts[keV])	Surface Area Deposition[a] ($\mu Ci/m^2$)	
		Fixed-Wing Aircraft[b]	Helicopter[c]
Americium-241 (^{241}Am)	60 keV	430	0.2
Cesium-137 (^{137}Cs)	662 keV	2.0	0.05
Cobalt-60 (^{60}Co)	1,173-1,333 keV	0.3	0.02
Iodine-131 (^{131}I)	365 keV	4.0	0.06

[a] Minimum detectable activity value is the three-sigma value due to the counting statistics in the spectral energy window of the photo peak of interest.

[b] Fixed-wing systems are equipped with one 2-inch by 4-inch by 16-inches NaI(*Tl*) log flown at an altitude of 305 meters (1,000 feet) above ground level, a flight line spacing of 305 meters (1,000 feet), and an average ground speed of 72 meters per second (140 knots). Flying at higher altitudes (e.g., 1,500 feet) will reduce delectability by a factor of 3 or more.

[c] Helicopter systems are equipped with eight to twelve 2-inch by 4-inch by 16-inch NaI(*Tl*) logs flown at an altitude of 46 meters (150 feet) above ground level, a flight line spacing of 76 meters (250 feet), and an average ground speed of 36 meters per second (70 knots). Processing the data using a 9-second averaging routine can enhance the delectability up to a factor of 3. MDA cited are for eight-log detector array.

C.6 Response Times

One fixed-wing aircraft[4] and one helicopter[5] are stationed at both RSL-Nellis in Las Vegas, Nevada, and RSL-Andrews near Washington, D.C. Flight times from both locations for both types of aircraft are shown in Figure C-5 and Figure C-6.

For fixed-wing flight times, the concentric circles depict 480 kilometers (300 miles), representing one hour of aircraft flight time. Refueling stops of a one-hour duration will generally occur at three-hour intervals. Every third circle is color-coded to emphasize the extra time needed for refueling.

For helicopter flight times, the concentric circles show 460 kilometers (290 miles), representing 2.25 hours of flight time. Refueling stops of up to one hour duration will occur at each circle, so the time expended is 3.25 hours for each circle. Maximum daily flight time will not exceed 10 hours for a two-pilot crew. Specific flight routes and times for both types of aircraft will be determined by the pilot-in-command after analysis of weather, aircraft loading, and other pertinent mission information.

[4] Twin-engine fixed-wing aircraft are used by the AMS for initial ground deposition and wind sounding measurements

[5] Twin-engine helicopters are used by the AMS for low-altitude radiation survey detection and monitoring.

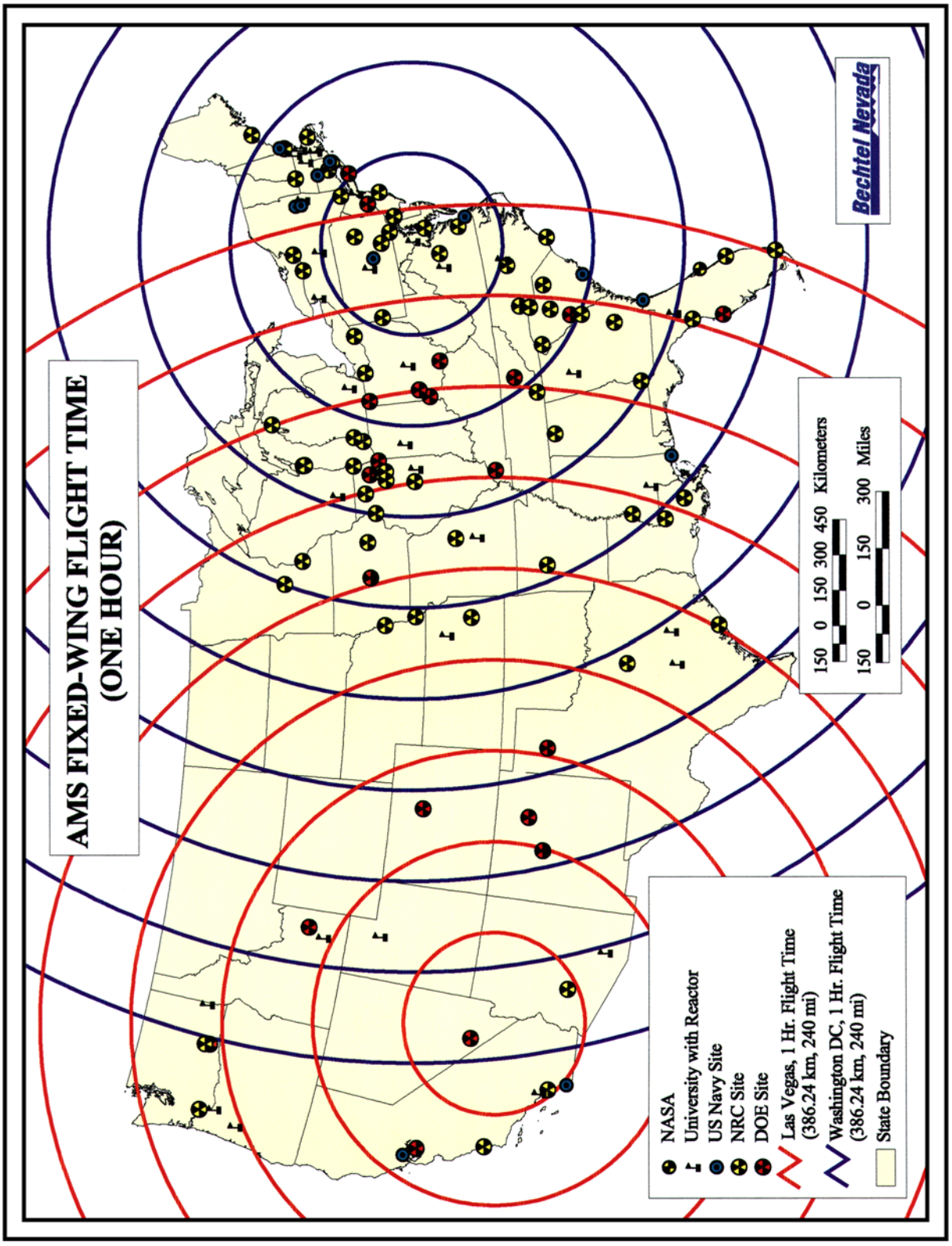

FIGURE C-5. ***RESPONSE FLIGHT TIMES FOR THE FIXED-WING AIRCRAFT STATIONED AT NELLIS AFB AND ANDREWS AFB.***

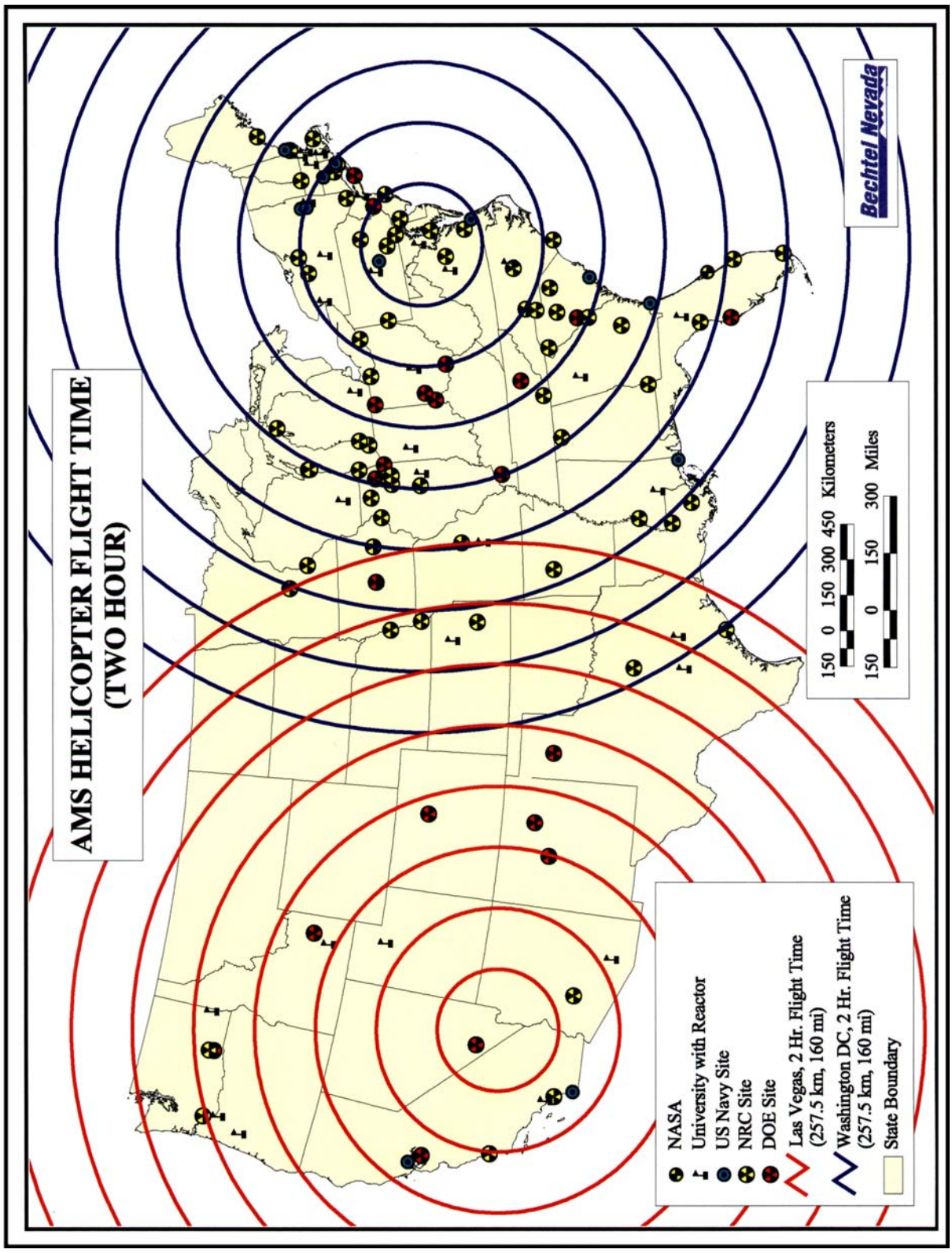

FIGURE C-6. ***RESPONSE FLIGHT TIMES FOR THE HELICOPTERS STATIONED AT NELLIS AFB AND ANDREWS AFB***

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APPENDIX D

ATMOSPHERIC DISPERSION MODELING

D.1 National Atmospheric Release Advisory Capability (NARAC)

The following two standard initial early or emergency phase products are produced by the National Atmospheric Release Advisory Center (NARAC) at Lawrence Livermore National Laboratory (LLNL) for radiological incidents:

1. Four-day Total Effective Dose Equivalent (TEDE) is plotted in Rem. TEDE includes doses from inhalation and cloud shine from cloud passage, four days of ground shine, plus four days of inhalation of resuspended material. Contours are given for the EPA Protective Action Guidelines (PAGs).
2. Total Deposition is plotted in microCuries per square meter. Total deposition is the amount of material deposited on the ground from both wet (precipitation) and dry (gravitational and dispersion) processes.

Standard Intermediate phase products include the following:

1. The first year dose includes the Effective Dose Equivalent (EDE) from one year of ground shine plus the Committed Effective Dose Equivalent (CEDE) from inhalation of one year of resuspended material.
2. Dose from the food ingestion pathways based on FDA Derived Intervention Levels for specific nuclides.
3. Total Deposition.

Each of these products represents effects from the sum of all nuclides released as well as their daughter products. In addition to standard products, organizations can request other products such as air concentration, dose rate, components of the TEDE, or deposition for specific times, nuclides, contour values, or sources.

NARAC mapped products aid in:

1. Assessing the downwind areas receiving doses and surface contamination.
2. Deploying field teams to sample the affected area.
3. Planning for AMS surveys.
4. The development of PARs and protective action decisions.

NARAC products may be requested and received electronically via a client-server application called the NARAC iClient or via the World Wide Web. These tools allow multiple organizations to simultaneously view results. Alternatively products can be e-mailed or faxed to specific users.

NARAC contours are routinely delivered electronically to the FRMAC GIS for inclusion as a layer on large-scale mapped products.

For users with direct electronic connections, initial default NARAC products can be received automatically in 5-10 minutes of the completed request. After initial plots are distributed NARAC meteorologists will modify the source characteristics to match the set of ground and/or aerial survey measurements collected at and distributed from the FRMAC Data Center. It typically takes 30-90 minutes for NARAC to prepare inputs, run models, quality assure calculations, and deliver refined plots based on more detailed information or measurement data. For further information see http://narac.llnl.gov.

NARAC and Sandia National Laboratories' (SNL) High Consequence Assessment and Technology Department have each developed unique and complementary consequence assessment tools that have recently been integrated into a unified tool set.

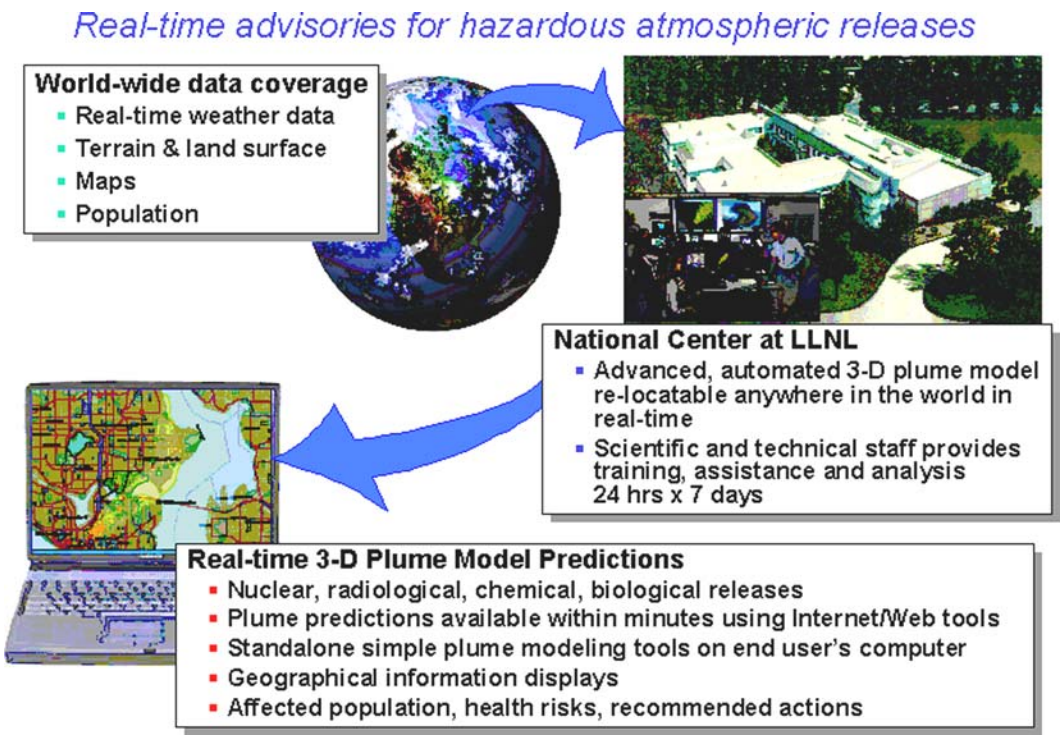

FIGURE D-1. ***NATIONAL ATMOSPHERIC RELEASE ADVISORY CENTER (NARAC) MODELING SERVICES AND TOOLS***

D.2 Sandia Hazard Assessment Response Capability (SHARC)

In addition to the radioactive material dispersal capabilities discussed in paragraph 3.6.7, SHARC has the capability of simulating the prompt effects of both conventional and nuclear detonations. Conventional effects simulated include: overpressure versus range, radius of various injuries (e.g., ear drum rupture) on people, and safe distance from the blast. Nuclear effects simulated

include: light and heavy damage to various types of structures; deaths, major, and minor injury due to the prompt radiation, thermal radiation, and overpressure. Human Effects calculations take into account the population distribution among structure types and the protection afforded by the structure.

SHARC also contains a fully integrated GIS viewer and consequence report generator. These capabilities allow SHARC to display contours of dispersed radiation, and other effects, on top of maps that display location features (roads, cities, hospitals, etc.) of interest, and then consequences of the simulation. SHARC is a standalone, self-contained software, capable of simulating a dispersal of radioactive material, producing maps of effect, and generating a report on those effects without the need for support software or a connection to the internet.

SHARC provides a reasonably sophisticated atmospheric dispersion modeling software that can be operated on a laptop computer. It can provide a comprehensive report in less than 30 minutes. The software is intentionally designed to operate as stand-alone software on a laptop or desktop computer while still providing rapid dispersion models that account for atmospheric stability and vertical variability conditions. SHARC's stand-alone capability is comparable to that of LLNL Hotspot software. However, SHARC performs more intricate atmospheric dispersion calculations that can account for the impacts to the plume caused by atmospheric dynamics, as a result the SHARC software takes somewhat longer than Hotspot to produce a report (approximately 15 to 30 minutes). Due to the stand-alone design of SHARC it does not require internet communications to function as is required for some of the more complex features of the LLNL ARAC i/Client software. SHARC is designed to fill the gap between the LLNL Hotspot and ARAC/iClient software by providing more sophistication in the algorithm than Hotspot provides, while still remaining as stand-alone software capable of running on a laptop or desktop computer. Work is underway to make iClient and SHARC cross-compatible so that one or both software codes can be used depending on the nature of the emergency. SHARC is also integrated with the SNL developed Turbo FRMAC software. The Turbo FRMAC software is designed to assist in the Assessment portion of an event to allow Emergency Planners to make determinations on the radiological deposition and dose to individuals at given locations.

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APPENDIX E

LOGISTICAL REQUIREMENTS

E.1 Overview

Under most conditions, the Federal Radiological Monitoring and Assessment Center (FRMAC) has the resources to be able to function self sufficiently at the incident site, once given a facility not being used for evacuation purposes, without additional logistical support from the state. FRMAC's resources help to ensure that operations minimally impact state and local economies without being a burden to them. However, if conditions are extremely severe, either in terms of weather or location (e.g., Point Barrow, Alaska, in January), the CM/FRMAC is not prepared to sustain itself without support from other Federal agencies. The selection of a CM/FRMAC site will include consideration of housing, airport facilities, and vehicle availability. All of these factors may be affected by the magnitude of the emergency, evacuation status, presence of an airborne radioactive plume, and other factors that will only be known at the time of the emergency. In addition, interaction with state and local monitoring activities and the location of emergency operations facilities will be considered. Conditions at the time will dictate CM/FRMAC site selection

E.2 State Assistance

The most important contribution that state officials can bring to a FRMAC response is its people and their local knowledge. Trained state and local personnel are an essential resource in ensuring the FRMAC priorities for monitoring and assessing the radiological hazard are established in accordance to *state requirements and needs*.

State officials working within the FRMAC act as the primary point of contact between the Governor or other high-ranking state officials. State and Federal health physicists will work together to determine the extent and level of contamination in terms of radiation dosage to the population and the environment.

State personnel should plan on participating in shifts and supporting the FRMAC 24-hours per day, 7 days a week until the initial phase is over and the environment has been characterized. The number of state and/or local personnel required to support a FRMAC is a function of what the state can adequately afford. Optimally, a minimum of *7 state or local personnel* would be needed. They would include during the day shift the senior state official working with the FRMAC Director, a monitoring liaison, radiation assessment liaison, and a field team coordinator. The evening shift would optimally require a senior state official, a monitoring liaison Manager and a radiation assessment liaison. State functional participation within the FRMAC would also benefit greatly by having personnel involved in Health and Safety as well as other critical positions within the FRMAC, including administrative support.

In addition, and if available, FRMAC could utilize as many state radiological field monitoring teams as possible. These key state monitors would team with Federal, National Laboratory, and contractor monitors to provide environmental monitoring and sampling throughout the region. Their knowledge and experience in the area would be invaluable to the overall credibility of the environmental data and radiation analysis performed at the FRMAC.

E.3 Law Enforcement

In addition to the personnel requested above, another asset state and local officials can provide is security. The FRMAC will require a security perimeter that must be maintained by law enforcement with the jurisdiction to control crowds and traffic at various locations. FRMAC will require 24-hour law enforcement services to the extent that state and local agencies can provide.

In the event that local law enforcement cannot be obtained and controlled by state resources, it may be necessary to employ Federal security, including the use of military personnel, federal agents, or off-duty local law enforcement. State planners can assist by coordinating in advance with local law enforcement agencies for this purpose.

E.4 Site Specifications

Whenever possible, a CM/FRMAC will be located within 16 to 24 kilometers (10 to 15 miles) of the emergency scene to effectively carry out its mission. Because of the expected use of the U.S. Department of Energy's (DOE) Aerial Measuring System assets, the CM/FRMAC location should be convenient to an airport or a helicopter pad to facilitate rapid turnaround. Specific site specifications are situation dependent and will vary in accordance with the level of the response. Following is a description of the site requirements that may *typically* be required for each of the phased response elements. It is important to keep in mind, however, that these requirements are incident dependent.

CMRT Phase I

The Phase I team is a small (32 person), rapidly-deployable team focused on obtaining and assessing gross field monitoring measurements. It is staffed for 24-hour operations and is a stand-alone response. It requires enough consumables to last for 72 hours. Its equipment load is approximately 2,500 lbs (200 cubic feet). It deploys in a single aircraft out of Las Vegas within 4-hours wheel up of notification to deploy. All equipment and personnel deploy on a single aircraft. The Phase I team is activated during the crisis phase of an emergency response (i.e., when the potential for a radiological consequence may occur) and only requires a modest area in which to meet. An office or a conference room with three or four telephone lines would be adequate. The Phase I team is an asset to the state and local emergency planners, so a location conducive to meeting with these managers would be ideal.

CMRT Phase II

Should the radiological incident escalate to a level requiring a Phase II deployment, state officials may need to begin preparations to seek additional space to accommodate the arrival of a CMRT

Phase II team of an additional 32 personnel with an equipment load of 39,000 pounds (2,400 cubic feet) of equipment. This response is dispatched 12-hours wheels up from Las Vegas after notification. Upon arrival, the Phase II team will work with state and local emergency responders to identify the status and magnitude of the incident and accurately define areas where long-term relocation of the population may be warranted. They also provide augmentation and relief for the initial Phase I team. The team is staffed for 24-hour operations and can operate as a stand-alone response for weeks. Their consumables must be re-supplied every few days.

CMRT Phase III

The Phase III response comprises 45 additional personnel drawn from various contract organizations and the National Laboratories. An additional 45,000 pounds (200 cubic feet) of equipment is also included. This phase can respond within 24-28 hours out the National Laboratories and remote RAP regions after notification. In additional to the additional personnel and equipment, the Phase III also provides support from the NNSA Mobile Laboratory (HOTSPOT) which deploys out of Lawrence Livermore National Laboratory (LLNL). The Phase III team is staffed for 24-hour operations and is prepared to be a stand alone response for weeks. Consumables must be re-supplied every few days to support the increased number of team members.

Advisory Team

The Advisory Team is an independent body of the FRMAC but maintains a close working relationship with FRMAC elements. The most efficient arrangement to facilitate this relationship is for the Advisory Team to be housed within the FRMAC facility. During set-up operations, the FRMAC support personnel will ensure an area is set aside so that the Advisory Team may operate independently, as well as in conjunction with FRMAC operations. To ensure that the Advisory Team is able to work optimally, FRMAC support personnel will ensure that electrical power and communications tools are available. FRMAC groups (Monitoring, Assessment, etc.) will work closely with the Advisory Team as the situation dictates, or when requested. The A-Team will utilize the FRMAC Action Request form (see paragraph 4.4.1) to ensure documentation and clear understanding of all data and assessment requirements.

FRMAC

When other Federal agencies integrate into the response along with State and local agencies the response is designated a FRMAC and an indoor workspace of 929 to 1,858 square meters (10,000 to 20,000 square feet) is required. Space must be available for administrative functions and for specialized equipment, such as a Geographic Information System, communications, photography, and still video. A large, fenced, staging area is needed for shipping and storage of supplies, large trucks and analysis vans, and the setup of outdoor communications equipment. Adequate electrical service must be available. However, DOE has the capability of providing sufficient electrical service, if required.

The availability and suitability of the following facilities and resources will be considered in the selection of a FRMAC site:

1. Site access—airport and/or major highways to accommodate large trucks and vans

2. Communications—clear of interference, appropriate terrain for a satellite antenna, telephone trunk lines
3. Housing—hotels or military quarters
4. Vehicle rental, including several types of large trucks and vans
5. Medical facilities—hospital or dispensary
6. Food services—round-the-clock catered service
7. Materials and services—office supplies, minor repairs, and security.

E.5 Site Selection

A final FRMAC operating site will not be selected until an incident occurs. This is due to the fact that the CM/FRMAC may be responding in the aftermath of an earthquake, hurricane, flood or possible terrorist activity. A significant radiation release may preclude access to pre-selected CM/FRMAC sites due to possible contamination. Therefore, any pre-selection of CM/FRMAC sites is limited to simply identifying one or two potential locations for each major, fixed nuclear facility. The DOE Regional Coordinating Offices should be informed of the identity and location of these potential CM/FRMAC sites. Members of the CMRT I, in consultation with the Coordinating Agency, state(s), and local authorities, will make the final selection of a FRMAC site based on the current emergency conditions. Potential CM/FRMAC locations include armories, schools, hotels, and hangars (Figure E-1).

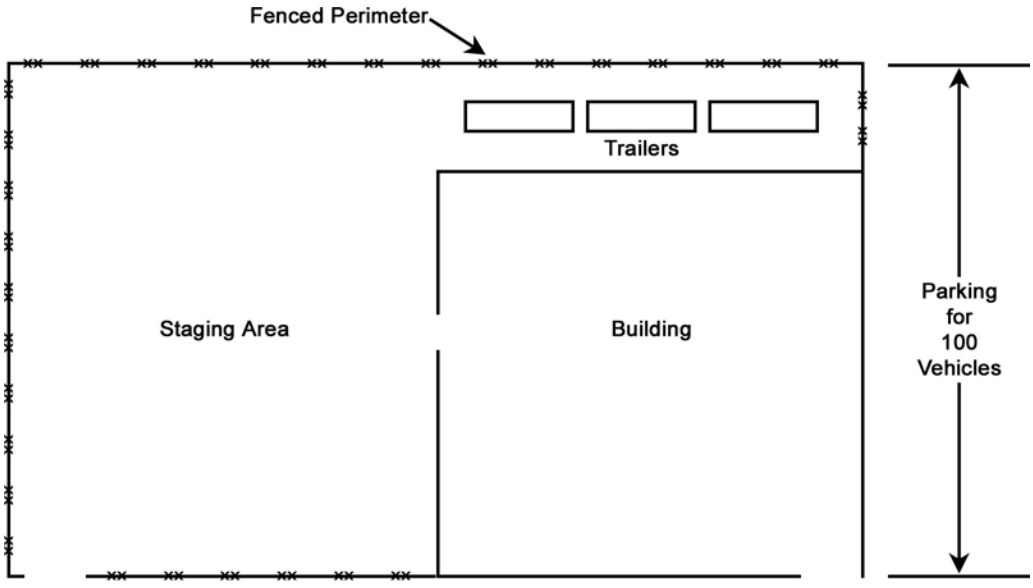

FIGURE E-1. ***EXAMPLE OF A POTENTIAL CM/FRMAC SITE***

E.6 Logistics

With a large number (in excess of 250) of state, specialized Federal, contractor, and National Laboratory personnel working in the FRMAC 24 hours per day, it will be necessary to accommodate the staff with transportation, food, and lodging. State officials can greatly assist Federal planners in this area. When CM assets are requested to be deployed, a Consequence Management Logistical Requirements form (Figure E-2) would be completed by NNSA/NSO and faxed to the appropriate state or local agency. The information on this form would advise the state or local agency what type of logistical assistance is being requested for a CMRT I, CMRT II, or FRMAC.

State officials can assist in meeting the demand for transportation. These needs can be met using school buses, rental cars, or other forms of mass transportation. School buses can be of great benefit during shift changes since it is likely schools will not be in session while the incident is on-going. State officials may also be able to obtain a number of trucks, vans, and sedans from their available state inventory to assist in transporting FRMAC participants and equipment. If possible, and if liability issues can be resolved, it would be of great benefit to allow FRMAC staff to use state vehicles if rental vehicles are unavailable.

Field monitoring and sampling teams comprised of both state and Federal teams will be among the highest priorities for trucks and vehicles. Vans and trucks will be required for a variety of sampling and data collection.

Hotel rooms will also be at a premium since non-critical members of the media and others may seize a large number of limited hotel rooms in an area. Securing essential facilities for critical support staff is a highly recommended action.

Some state planners have suggested that agreements be set in place between car rental companies and hotels. These agreements may help to ensure the availability of rental cars and hotel rooms when they are in short supply.

Aircraft Support

The deployment of multiple large cargo aircraft to the affected region will require state officials to assist in the identification of one or more nearby airports. It can be expected that the Federal government would deploy a number of military aircraft. These large aircraft require a minimum runway length of 3,000 feet and can weigh as much as 770,000 pounds. Personnel and equipment would be required to assist with unloading the aircraft. A 10,000 pound forklift with 36-inch tines is required to off-load and move the pallets. The equipment would be moved to the facility designated for the CM/FRMAC after it is unloaded or, if a facility has not yet been identified, to a holding area.

In addition, fixed-wing aircraft and helicopters will be brought in to support the on-going mission of the CM/FRMAC. It is necessary to ensure that the proper type and amount of fuel is available to support all aircraft. This would include general aviation fuel as well as jet fuel.

In addition, state personnel could also assist in collecting and transporting data taken from the aerial radiological surveys to decision makers.

Laboratory and Medical Supplies

Local laboratories, either nearby or at the scene, can provide environmental radiation contamination results to state and Federal decision-making officials quickly; however, FRMAC will also need access to local suppliers of liquid nitrogen, distilled water, and other laboratory-related supplies.

FRMAC deploys with licensed physicians from REAC/TS who specialize in radiological contamination and medical supplies. In the case of deployment to a remote location where nearby medical facilities are unavailable, FRMAC may also deploy with paramedics.

A very large volume of environmental field samples will be collected for analysis. While a very small sampling of data can and will be processed in the field for quick results, the vast majority of the samples will be analyzed at designated certified laboratories throughout the country. The state can help by pre-planning and working with overnight delivery services to ensure that the flow of data is not interrupted and given the highest priority.

Other Assets

Other useful information that state and local officials can provide to the FRMAC includes GIS data from local utilities as to the location of utility poles (telephone and power), man-hole covers for sewers, other access areas, and known global positioning satellite (GPS) location points throughout the region. In addition, latitude and longitude reference points, using GPS systems, will identify all field data collected.

Portal monitors will also be of great value in a large, potentially contaminated region. In the case of a large incident, it is expected that a large volume of people would request to be examined. The use of portal monitors is more efficient for scanning a large number of people for radiation contamination than handheld instruments.

The FRMAC will also bring a large amount of environmental radiation detection to the scene. State and local field monitoring teams may need to verify proper operation of their equipment and instruments to FRMAC standards. State and local equipment would then be added to the overall inventory of equipment available for use by field monitoring teams.

National Nuclear Security Administration / Remote Sensing Laboratory
Consequence Management Logistics Requirements Form

Upon activation of CM assets this form can be used to help meet the logistical requirements of the deployment.

General Information

Name of Response Asset: **CM Phase I**

The logistical considerations behind a NNSA CM response are considerable. For a Phase I deployment, 2,000 lbs. of equipment is moved in addition to the personnel required for the response. The CM phases will bring their own scientific and communications equipment to fulfill the mission, but other logistical needs must be met in order for the mission to be a success. This form outlines the personnel, equipment, and method of transportation that will be used to respond to a given location, as well as the logistical needs required to facilitate the response. Local authorities need not provide all of the following items, but should be able to supply information to the CMHT to ensure the necessary items are in place once the CM deployable teams arrive. Sections are denoted where local procurement would be most beneficial.

This phase consists of 31 personnel. It is assumed that all accommodations, meals, and rental cars will be arranged through the RSL Home Team and all information regarding local accommodations and rental agencies should be directed to the Home Team Contact during initial activation.

Transportation

Deployment mode of transportation (**CMRT will arrive via**):

- ☒ Commercial Air
- ☒ Military Air
- ☒ Ground

Whatever mode of transportation is made available that will ensure the most rapid departure will be utilized.

Additional information:

Special airstrip requirements:

Military Airlift:

90 ft. X 5000 ft. (C-141 or larger)
90 ft. X 4000 ft. (C-130)
147 ft. X 5000 ft. (KC-135*)

Commercial / Charter Airlift:

100 ft. X 7400 ft. (747-200F)
100 ft. X 6000 ft. (727-XXX)

***A shoulder of 10-50 ft. is required on either side of the runway for this type aircraft.**

If deployed via airlift, equipment will require ground transportation from its point of debarkation to the response site. This equipment should be arranged for through local channels and be on hand when the Phase I Team arrives at the airfield.

Number of flatbeds/box truck required: **One 10 ft. (or larger) box truck**
Weight of incoming load: **Roughly 2,000 lbs. loaded on one 463L (88" X 108") military pallet or freeloaded on aircraft.**

It is assumed that if ground transportation is utilized, no assistance from local authorities will be required to relocate to the response site.

Load/Equipment Handling

Page 1 of 5
Date last revised: 30 June 2005

FIGURE E-2. ***Consequence Management Logistics Requirements Form***

Material handling equipment required: This equipment should be arranged for through local channels and be on hand when the Phase I Team arrives at the airfield.

☒ **One 10K forklift for on/off-loading of pallet (if cargo is palletized)**
☒ **One K-Loader* (if pallet is transported via air)**

***A K-Loader is a large military-style vehicle used to off-load palletized equipment from military aircraft.**

Operations Center Communication Requirements

Communications requirements: The facility selected should have at a minimum the following
a. Number of phone lines: **2**
b. Number of high speed data lines: **1**

The CMRT deploys with telephone equipment and portable radios.

Operations Center Space Requirements

Required warehouse storage space (square footage and height): **200 sq. ft. up to 60" high**

Footprint of equipment while in use (square footage needed): **2,000 sq. ft.**

Required office space: **2,000 sq. ft.**

Operations Center Power/Electrical Requirements

Number of electrical outlets (if needed):
Two 20 amp AC outlets (recommended.) This converts to 2,000 watts.

Additional requirements:
1. **Parking for up to 15 vehicles**
2. **Latrines for up to 40 people**

Miscellaneous Requirements

Where practicable, provide the following information to the CM Home Team, as well as have ready to provide at the Advance Party Meeting.

1. **Local medical facilities and/or hospitals**
2. **Vendors for liquid nitrogen and fuels**

Contact Information

Deployed Point of Contact: (Deployed POC may be en-route to the response site during the first six hours following activation and therefore may not be immediately available. Direct all contact to the Home Team if POC is unreachable during that time.)
a. Name:
b. Cell Phone Number:
c. Pager:
d. Fax

Additional Information

National Nuclear Security Administration / Remote Sensing Laboratory

FIGURE E-2. ***Consequence Management Logistics Requirements Form (continued)***

Consequence Management Logistics Requirements Form

Upon activation of CM assets this form can be used to help meet the logistical requirements of the deployment.

General Information

Name of Response Asset: **CM Phase II**

The logistical considerations behind a NNSA CM response are considerable. For a Phase II deployment, 29,000 lbs. of equipment is moved in addition to the personnel required for the response. The CM phases will bring their own scientific and communications equipment to fulfill the mission, but other logistical needs must be met in order for the mission to be a success. This form outlines the personnel, equipment, and method of transportation that will be used to respond to a given location, as well as the logistical needs required to facilitate the response. Local authorities need not provide all of the following items, but should be able to supply information to the CMHT to ensure the necessary items are in place once the CM deployable teams arrive. Sections are denoted where local procurement would be most beneficial.

This phase consists of 32 personnel. It is assumed that all accommodations, meals, and rental cars will be arranged through the RSL Home Team and all information regarding local accommodations and rental agencies should be directed to the Home Team Contact during initial activation.

Transportation

Deployment mode of transportation (**CMRT will arrive via**):	Additional information:
☒ Commercial Air ☒ Military Air ☒ Ground Whatever mode of transportation is made available that will ensure the most rapid departure will be utilized.	**Special airstrip requirements:** **Military Airlift:** **90 ft. X 5000 ft. (C-141 or larger)** **90 ft. X 4000 ft. (C-130)** **147 ft. X 5000 ft. (KC-135*)** **Commercial / Charter Airlift:** **100 ft. X 7400 ft. (747-200F)** **100 ft. X 6000 ft. (727-XXX)** ***A shoulder of 10-50 ft. is required on either side of the runway for this type aircraft.**

If deployed via airlift, equipment will require ground transportation from its point of debarkation to the response site. Transportation for this equipment should be arranged through local channels and be made available when the Phase II Team arrives at the airfield.

Number of flatbeds required: **Two 53' open-sided flatbed trucks**
Weight of incoming load: **Roughly 29,000 lbs. loaded on six 463L (88" X 108") military pallets.**

It is assumed that if ground transportation is utilized, no assistance from local authorities will be required to relocate to the response site.

Load/Equipment Handling

Material handling equipment required: This equipment should be arranged for through local channels and be on hand when the Phase II Team arrives at the airfield.

Page 3 of 5
Date last revised: 30 June 2005

FIGURE E-2. ***Consequence Management Logistics Requirements Form (continued)***

☒ **One 20K forklift for on/off-loading of pallet (if cargo is palletized)**
☒ **One K-Loader* (if pallet is transported via air)**

***A K-Loader is a large military-style vehicle used to off-load palletized equipment from military aircraft.**

Operations Center Communication Requirements

Communications requirements: The facility selected should, at a minimum, contain the following:

a. Number of phone lines: **10**
b. Number of high speed data lines: **2**

The CMRT deploys with telephones, portable radios, and a limited satellite capability.

Space Requirements

Required warehouse storage space (square footage and height): **1,000 sq. ft. up to 96" high**

Footprint of equipment while in use (square footage needed): **5,500 sq. ft.**

Required office space:
a. FRMAC **5,000 sq. ft. minimum**
b. Forward staging areas **5,000 sq. ft. minimum (if necessary)**

Power/Electrical Requirements

Number of electrical outlets (if needed): **(12) 20 amp AC outlets (recommended.) This converts to 12,000 watts.** **Generators deployed with the team would be utilized to supplement power requirements.**	Fuel required for deployed generators (**CMRT Home Team will obtain a source, but may require local assistance**) a. Amount: **40 gallons** b. Type: **20 gallons each of diesel and unleaded per 24-hour shift**

Additional requirements:
1. **Parking for 30 vehicles**
2. **Latrines for 75 people**

Miscellaneous Requirements

Where practicable, provide the following information to the CM Home Team, as well as have ready to provide at the Advance Party Meeting.

1. **Local medical facilities and/or hospitals**
2. **Vendors for liquid nitrogen and fuels**

Contact Information

Deployed Point of Contact:
a. Name:
b. Cell Phone Number:
c. Pager:
d. Fax

Non-Deployed (Home Team) Point of Contact:
a. Name:
b. Phone Number:
c. Fax:

Page 4 of 5
Date last revised: 30 June 2005

FIGURE E-2. ***Consequence Management Logistics Requirements Form (continued)***

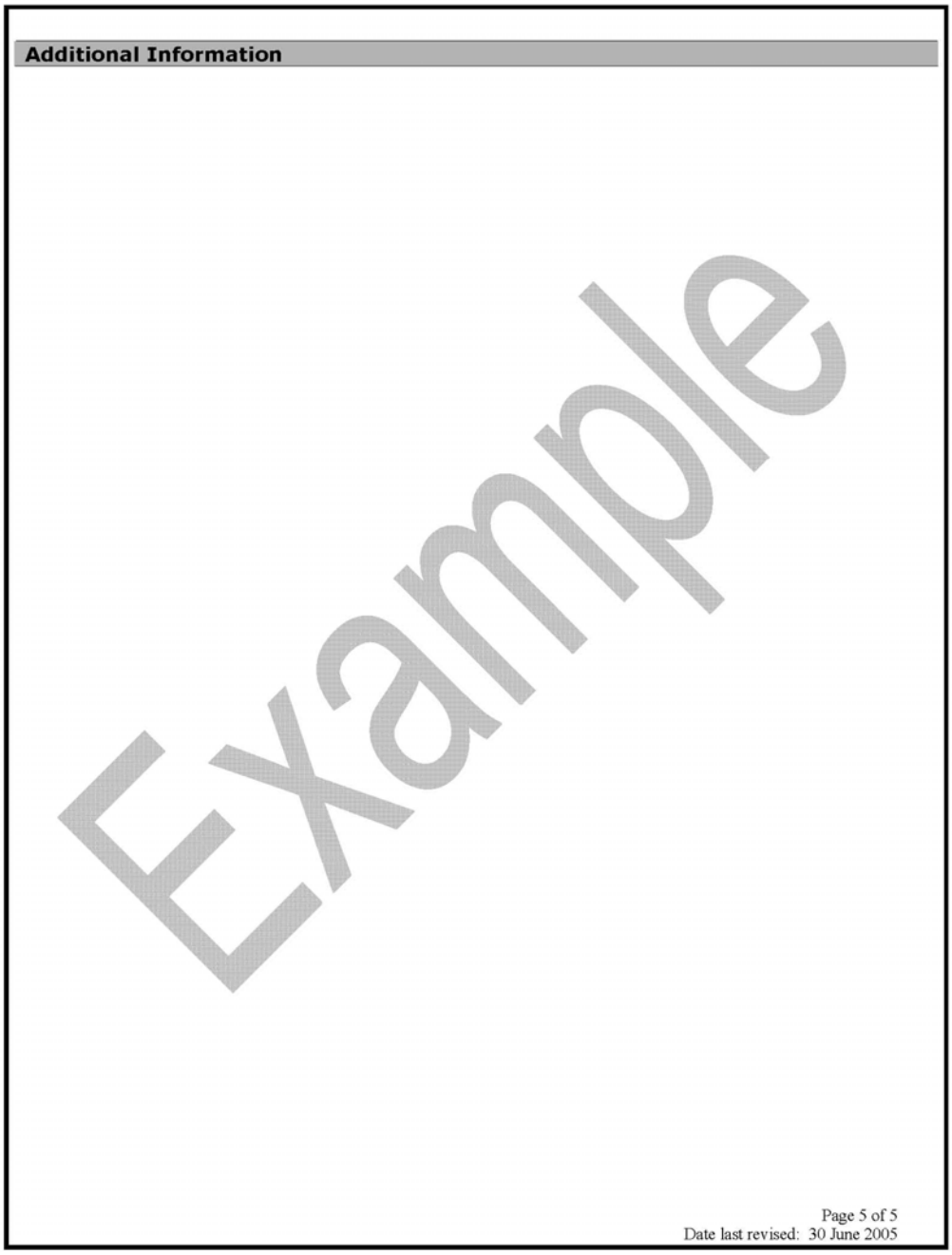
Additional Information
Example
Page 5 of 5
Date last revised: 30 June 2005

FIGURE E-2. ***Consequence Management Logistics Requirements Form (concluded)***

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APPENDIX F

FRMAC ADVANCE PARTY ISSUES

F.1 Introduction

One of the first actions that the CMRT I performs as part of the initial response is to conduct an Advance Party Meeting at the emergency site. The primary purpose of the U.S. Department of Energy's (DOE) phased response is to provide initial technical capability and to prepare for the arrival of additional FRMAC resources in order to ensure an effective and timely FRMAC operation in support of the Coordinating Agency and the state(s).

This Appendix describes FRMAC Advance Party issues and includes an example of an Advance Party Meeting Checklist (Figure F-1), a sample FRMAC Monitoring and Sampling Plan (Figure F-2), and a Monitoring and Sampling Implementation Plan (Figure F-3). The issues discussed herein should be used as a guide for planning purposes. Actual FRMAC Advance Party actions and meeting agendas may be modified to meet the emergency conditions.

F.2 Home Team Support

When requested, or when directed to deploy any of the CM national assets, home team nodes will be established at the Remote Sensing Laboratory, Las Vegas, Nevada; Sandia National Laboratories, and the National Atmospheric Release Advisory Capability (NARAC) at Lawrence Livermore National Laboratory. The home teams, NNSA/NSO EOC, DOE/HQ, and other affected sites will be linked via the Emergency Communications Network (ECN). Field elements will be tied into the ECN via field communications capabilities. Home teams will be prepared to provide logistical support, develop initial effects predictions and assessments of field data, and provide expert advice while field elements are in the deployment phase. The assessed data can then be distributed securely over the ECN to other sites and to deployed elements. Once field elements are operational, the home teams will continue to provide support in the form of advice and data analysis until authorized to stand down by DOE/NNSA.

The CMHT nodes will be prepared to stand-up within an hour of notification during normal working hours and within two hours during non-working hours.

Home Team support is provided to the CMRT I and to the follow-on consequence management teams by teams located at DOE's Remote Sensing Laboratory (RSL) in Las Vegas, Nevada, and at the national laboratories. From their various locations, the teams can:

- Provide ACRID or NARAC effects models to the field teams as soon as the field teams arrive on-scene allowing for a very early initial assessment of the situation.
- Run Turbo FRMAC calculations and provide results to the field Assessment Scientists early in the event.

- Provide early map and GIS location information to the field teams.
- Perform effects and prediction models run in parallel with the fielded team to:
  - Confirm field team results.
  - Evaluate additional scenarios in support of field team efforts.
- Provide weather data related to the event site in the event that web access is not available or if better information is available.
- Home Team Assessment Scientists can perform the more complex/involved assessment calculations supporting the field Assessment Scientists and provide technical information to aid in out-of-the-ordinary assessment requests.

F.3 Prior to Departure for the Incident Site

The Nuclear National Security Administration Nevada Site Office (NNSA/NSO) will:

- Identify the Department of Energy Senior Energy Official (SEO) who will meet the CMRT I.
  - If not upon arrival at the airport, when and where?
- Identify the Coordinating Agency official who will meet the initial CMRT I.
  - If not upon arrival at the airport, when and where?
- Notify the Coordinating Agency, state, local, and/or facility representatives of the tentative arrival schedule of the CMRT I and establish a tentative date, time, and location for the Advance Party Meeting.
- Electronically transmit to the Coordinating Agency, state, local, and/or facility representatives the Advance Party Meeting Agenda.
- Obtain the National Atmospheric Release Advisory Capability (NARAC) plot.

F.4 Upon Arrival On–Scene

The CMRT I will:

- Notify NNSA/NSO, DOE Headquarters (DOE/HQ), Coordinating Agency, and state(s) of arrival and obtain updates.
- Obtain specifics from the Home Teams for the Advance Party Meeting.
- Meet with the on-scene SEO, Radiological Assistance Program (RAP) Team Leader, and Aerial Measuring System (AMS) Team Leader.
  - Identify status, activities, and problem areas.
  - Are DOE/HQ and NNSA/NSO being kept up-to-date?
  - What DOE/other federal assets have been activated, are en route, or are on-site?
  - Suggestions for locating the FRMAC.

- Obtain updated Sandia Consequence Report or NARAC Plot.
- Meet with the Coordinating Agency official to identify status, activities, and problem areas.

F.5 Advance Party Meeting Products

The initial FRMAC Monitoring and Sampling Plan will reflect Coordinating Agency and state requirements and may include the following general priorities:

PRIORITIES FOR INITIAL FRMAC MONITORING AND SAMPLING PLAN

- Identify state/local requirements.
- Identify Coordinating Agency requirements.
- If release is ongoing or projected, determine the presence of radioiodines
- Monitor close to evacuated areas where people are located.
- Identify areas that have not been evacuated, but where early health effects are possible (100 rem in four days; i.e., 1 rem per hour).
- Identify areas that have not been evacuated, but where the federal protective action guide (PAG) for evacuation may be exceeded (greater than 1 rem in four days; i.e., without knowing isotopic ratios, 10 mrem per hour).
- After deposition, determine isotopic ratios.
- Provide a measure of the validity for the dispersion models in use.
- Establish air sampling stations to measure resuspension and future plume releases.
- Monitor institutions, facilities, and/or residences located in the evacuated areas which were not evacuated or where people must reenter.
- Identify hot spots.
- Characterize the off-site area.

Federal Radiological Monitoring and Assessment Center
(FRMAC)
Advance Party Meeting Checklist

I. ***List Key Officials, EOC(s) and Liaison(s) Information***

Positions	Name	Location of Operation/ Phone Number#
Key Officials: *Identify DHS Principal Federal Official, Coordinating Agency Representative, State, Tribal, County, and Local Response leaders, and introduce FRMAC leaders. Enter all available contact information.*		
DHS Principal Federal Official (PFO) or Designee		
Coordinating Agency Representative		
Lead State Official		
Lead Local Official		
Advisory Team Leader		
State Logistics Support		
FRMAC Director		
FRMAC Operations Mgr.		
FRMAC Monitoring Mgr.		
FRMAC Assessment Mgr.		
FRMAC Health & Safety Mgr..		
FRMAC Support Mgr.		
EPA Sr. Official		
FEMA Representative		
NRC Representative		

12/28/2005 1

FIGURE F-1. ***ADVANCE PARTY MEETING CHECKLIST***

Advance Party Meeting Checklist

Other Federal Agencies Involved in Response: *Identify and provide contact information for other Federal agencies involved in the response.*		
EPA Regional Rep.		
HHS/Advisory Team		
USDA/Advisory team		
EPA/Advisory Team		
Operational EOCs: *List the status of and contact information for activated Emergency Operations Centers (state, local government).*		
EOC	**Contact Name**	**Location of Operation/ Phone Number#**
State/Local Liaison(s): *Identify state and local contacts available to assist FRMAC with support and information for logistics functions (locating facilities for FRMAC, operations center, air cargo delivery, field staging areas, Aerial Measuring System [AMS] landing sites, fuel availability, radio frequencies, etc.).*		
Organization	**Contact Name**	**Location of Operation/ Phone Number#**
Federal/FRMAC Liaison(s): *Identify Federal support to the other operating State and Federal EOCs.*		
Organization	**Contact Name**	**Location of Operation/ Phone Number#**

12/28/2005 2

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E F-1. ADVANCE *PARTY MEETING CHECKLIST (continued)*

Advance Party Meeting Checklist

II. *Present the Advance Party Briefing: FRMAC Director* **[Should include how data is distributed within the FRMAC and released to the Coordinating Agency and the State.]**

III. *Identify the Group Leads for Technical/Operational Meetings.*

Monitoring and Sampling:	
Assessment:	
Health and Safety:	
Laboratory Analysis:	
Support:	
Restoration:	
(Other):	

IV. *Will the State/locals integrate field monitoring, dose assessment, health and safety, etc., with the FRMAC?* **Yes** _____ **No** _____

V. *Status/Description of Incident (On-Site and Off-Site)*

Has a release occurred? *Identify if a release has occurred by marking "Yes" or "No". If so when? When did release stop? Did more than one release occur? Please provide information below.*	Yes	No
If so, has it terminated? *If a release has occurred, identify if it has terminated by marking "Yes" or "No" Add any additional information in space below.*	Yes	No
What is the source term (measurements, isotopic identification, predictive models, etc.)? *Identify the estimated source term(s), dominant isotopes, and meteorological conditions present during the release. If any actions have been taken to stop and/or mitigate the release(s), state them here.*		

12/28/2005 3

FIGURE F-1. ***ADVANCE PARTY MEETING CHECKLIST (continued)***

Advance Party Meeting Checklist

What computer models have been run? *State whether any atmospheric prediction plots or other computer models have been made*
Where are the resulting data products? *If plots have been made, state where, or how, they may be obtained.*
Has any data been collected or samples taken? *Indicate if any off-site monitoring/sampling results are available by marking "Yes" or "No." If "Yes", please complete the following.* — Yes No
How does FRMAC obtain this data? *Describe how FRMAC can obtain the data from the above, if applicable.*
Who makes the Protective Action decisions? *(State who has the responsibility for initiating/amending public protective actions (i.e., state, tribal, county, local authorities).*
What is the status of Protective Actions taken for public protection? *(Provide brief summary of actions taken in the space below. Continue on separate page, if necessary).*

12/28/2005 4

FIGURE F-1. ***ADVANCE PARTY MEETING CHECKLIST (continued)***

Advance Party Meeting Checklist

VI. ***List of Concerns and Priorities.***

List operational problems, greatest needs/resource shortfalls. Prioritization will be done at Advance Party Meeting.

Agency	Concern	Priority *(Leave blank. Complete at Advance Party Meeting.)*
State		
Local		
Other Federal Agency		
Nuclear Facility		

12/28/2005 5

FIGURE F-1. ***ADVANCE PARTY MEETING CHECKLIST (continued)***

Advance Party Meeting Checklist

PFO or Designee: _____ Date: _____

Coordinating Agency Rep: _____ Date: _____

FRMAC Director: _____ Date: _____

State Representative: _____ Date: _____

Local Representative: _____ Date: _____

12/28/2005 6

FIGURE F-1. ***ADVANCE PARTY MEETING CHECKLIST (concluded)***

Monitoring and Sampling Plan

Weapons Dispersal Accident

(Example from Dingo Dawn Exercise)

1. Assess the footprint to determine the area of radiological concern where EPA Protective Action Guidelines (PAGs) are exceeded. Measured activity levels of Am-241 will be used to assess the doses to the population.
   a) Field teams will collect one hour high-volume air samples in order to determine resuspension factors over the long term. Resources will be concentrated on populated areas near the boundaries where PAGs could be exceeded (isopleth line). Accurate measurements of the resuspension factor will provide much better estimates of doses to the population over the long term (1 year or more). High-volume air sampling systems will be set up at a sampling rate of 10-40 cubic liters per minute (depending upon dust loading).
   b) Based upon the calculated doses and anticipated time inside the contaminated area, it is not anticipated that face/breathing protection will be necessary of emergency worker activities. However, face/breathing protection is suggested for any extended remediation activities within highly contaminated areas.
   c) Field teams will take ground deposition measurements using Violinist III systems and High Purity Germanium *in situ* spectrometers sensitive to plutonium and americium contamination. Field monitoring measurements of approximately 15 minute (900 seconds) duration are required in order to reach a Minimal Detectable Activity (MDA)s below 100 nCi/m^2 (Violinist III) and 30 nCi/ m^2 (HPGe *in situ* system). Resources will be prioritized to provide ground-truth measurements for the aerial data, and to provide improved deposition data near the boundaries where the EPA PAGs may be exceeded. The *in situ* measurements will also be used to verify the assumed mix of the dispersed isotopes.
   d) Field soil sampling measurements will be taken in the affected area in order to verify the deposition levels measured with the aerial and field monitoring equipment. Soil samples of 100 cm^2 will be collected in accordance with the FRMAC Monitoring and Sampling manual.
   e) Rotary wing aerial measurement equipment will conduct aerial survey operations over the affected area to determine activity levels. Mission parameters will be 150 foot altitude above ground level (AGL) and a 250-foot line spacing at a speed of 70 knots. One helicopter and the associated aviation and technical personnel can be deployed to the incident site and can cover an area of approximately 20 square miles per day.

      Initial surveying of the affected area will give a Minimum Detectable Activity (MDA) of approximately 100 nCi/m^2 which is sufficient for delineation of the area affected by the EPA PAGs.

FIGURE F-2. ***EXAMPLE OF A FRMAC MONITORING AND SAMPLING PLAN***

2. Special request locations (i.e.; hospitals, nursing homes, Indian reservations, etc.) will be surveyed and characterized as needed. Violinist III, alpha probes, *in situ*, and air sampling will be used as appropriate to characterize these locations.
   a) North Kitsap High School surveyed for contamination to allow potential use as a receiving center for evacuated personnel.
   b) Survey the Navy Hospital and Harrison Hospital in Bremerton and Harbor View Hospital in Seattle and as necessary potentially contaminated personnel.
3. Identify location of, and characterize access control points. Based upon plume modeling and initial radiation monitoring data, the location of access control points will be determined. Radiation Control Technicians and Health Physicists will provide survey support at the control points. The intended location of the control points will be surveyed with alpha survey instrumentation (Nuclear Research Corporation Health Physics kits) to a level of 20 dpm/100 cm^2 (DOE release level).

MONITORING & SAMPLING MANAGER:_____

LOCAL CONCURRENCE: _____

STATE CONCURRENCE:_____

TRIBAL CONCURRENCE: _____

COORDINATING AGENCY CONCURRENCE:_____

FRMAC DIRECTOR: _____

SEO CONCURRENCE:_____

FIGURE F-2. ***EXAMPLE OF A FRMAC MONITORING AND SMPLING PLAN (continued)***

Monitoring and Sampling Implementation Plan

Weapons Dispersal Accident

(Example from Dingo Dawn Exercise)

Day 2 of Event

1. Assess the footprint to determine the area of radiological concern where EPA Protective Action Guidelines (PAGs) are exceeded. Measured activity levels of Am-241 will be used to assess the doses to the population.
   a) Two teams will be assigned to transverse the plume to verify the ground deposition identified by the ARAC/SNL plots. One team will start at the Bangor Subase boundary and the other will start in the area of the Port Madison Indian Reservation. These teams will take alpha probe measurements and 15-minute (900 second) Violinist III ground deposition measurements, which will provide a Minimal Detectable Activity (MDA) below 100 nCi/m^2.
   b) A third team will start in the area of Poulsbo and will also take alpha probe measurements and 15-minute (900 second) Violinist III ground deposition measurements, which will provide MDAs below 100 nCi/m^2. This team will be equipped with a High Purity Germanium *in situ* spectrometer, which will provide MDAs below 30 nCi/m^2 for 15-minute (900 second) measurements. One *in situ* measurement will be taken at approximately Sherman Hill Road and Viking Way NW if alpha probe measurements are above 300 dpm. The *in situ* measurement will be used to verify the assumed mix of the dispersed isotopes. In the area of Viking Way NW and Liberty Road, this team will establish an air sampling station and collect a one hour high-volume air sample (sampling rate of approx. 30 cubic liters per minute), complete ground surveys using an alpha probe and Violinist III, collect another *in situ* measurement, and collect a soil sample. This information will be used to determine resuspension factors.
   c) Based upon the calculated doses and anticipated time inside the contaminated area, it is not anticipated that face/breathing protection will be necessary for emergency worker activities. However, face/breathing protection is suggested for any extended remediation activities within highly contaminated areas.
   d) Rotary wing aerial measurement equipment will be deployed and conduct aerial survey operations over the affected area to determine activity levels starting at daylight.

FIGURE F-3. ***EXAMPLE OF A FRMAC MONITORING AND SAMPLING IMPLEMENTATION PLAN***

Helo Survey	**DAY 2 AM**	**Flight #1**
Goal:	First flight will under-sample the area, but should provide a good definition of deposition extent.	
Reasoning:	Based on width of ACRID Set 3 prediction, use 9-mile long lines => 10 minutes per line 2 ½ hour flight time => 30 lines Want to cover approximately 20 miles from GZ Use 5,000-foot line spacing	
Flight parameters:	150 foot AGL 5,000-foot line spacing Flight lines oriented North-South Start at water's edge west of GZ Lines are centered N-S on GZ Stop when no land is under flight lines	

Helo Survey	**DAY 2 Noon**	**Flight #2**
Goal:	Begin detailed mapping of deposition	
Flight Parameters:	150 foot AGL 250-foot line spacing Flight lines oriented North-South Start about 4 lines (1000 feet) west of GZ Lines are centered N-S on GZ Length of lines: 6 miles Total number of lines flown => 20 lines (about 1 mile along deposition)	

Helo Survey	**DAY 2 PM**	**Flight #3**
Goal:	Continue detailed mapping of deposition	
Flight Parameters:	Same as Flight #2, except that the length of lines will be determined from data analyzed from Flight #1	

FIGURE F-3. ***EXAMPLE OF A FRMAC MONITORING AND SAMPLING IMPLEMENTATION PLAN (continued)***

e) Special request locations (i.e.; hospitals, nursing homes, Indian reservations, etc.) will be surveyed and characterized as needed. Violinist III, *in situ*, and air sampling will be used as appropriate to characterize these locations.

f) A forth team will survey North Kitsap High School for contamination to allow potential use as a receiving center for evacuated personnel. Violinist III and alpha probe measurements will be taken and a one hour high volume air sample collected.

g) A fifth team will deploy to the Harbor View Hospital, Harrison Memorial Hospital, and Navy Hospitals in Bremerton and survey the facility and personnel, as necessary, for contamination. ADM 300 alpha probes will be used for personnel contamination surveys and appropriate Violinist III and alpha probe measurements taken to determine potential contamination levels of these facilities and associated parking areas and driveways.

h) Identify location of, and characterize access control points for evacuating personnel and reentry. As a team becomes available it will be deployed to assess contamination at the access control points. Radiation Control Technicians and Health Physicists will provide survey support at the control points. The intended location of the control points will be surveyed with alpha survey instrumentation (Nuclear Research Corporation Health Physics kits) to a level of 20 dpm/100 cm (DOE release level).

MONITORING & SAMPLING MANAGER:_____

LOCAL CONCURRENCE: _____

STATE CONCURRENCE:_____

TRIBAL CONCURRENCE: _____

COORDINATING AGENCY CONCURRENCE:_____

FRMAC DIRECTOR: _____

SEO CONCURRENCE:_____

FIGURE F-3. ***EXAMPLE OF A FRMAC MONITORING AND SAMPLING IMPLEMENTATION PLAN (concluded)***

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APPENDIX G

FRMAC POSITION DESCRIPTIONS

CM/FRMAC DIRECTOR

POSITION SUMMARY:

The CM/FRMAC Director is a senior DOE official appointed by the Manager of NNSA/NSO with concurrence from NNSA/HQ to manage each phase of a Consequence Management Response. If the consequence management response develops in to a FRMAC, the Consequence Management Director will assume the responsibilities of FRMAC Director during the emergency phase and intermediate phase prior to transition of control of the event to the U.S. Environmental Protection Agency. The CM/FRMAC Director is responsible for the overall execution of the response and ensures that CM/FRMAC activities reflect the prioritized requirements of the state(s) and the Coordinating Agency and meet the statutory requirements of participating Federal agencies.

The CM/FRMAC Director has the overall responsibility for the management and deployment of the deployed CMRT/FRMAC; execution of the mission; health and safety of FRMAC personnel; protection of classified information, government property, and critical assets; and ensuring compliance with all applicable DOE Orders, Occupational Safety and Health Administration (OSHA) standards, Department of Transportation (DOT) standards, and Federal statutes.

DUTIES AND RESPONSIBILITIES:

PREACTIVATION DUTIES AND RESPONSIBILITIES

1. Maintain knowledge of and familiarity with:

    - Homeland Security Presidential Directive (HSPD)-5
    - The National Response Plan (NRP) and the Nuclear/Radiological Incident Annex (Nuc/Rad Annex)
    - DOE Order 5530.5 (Federal Radiological Monitoring and Assessment Center)
    - *CMO's Handbook*
    - *FRMAC Operations Manual*
    - NNSA/NSO Alert and Activation Procedures
    - Remote Sensing Laboratory (RSL) Alert, Activation, and Deployment Procedures
    - 10 CFR 835 (Occupational Radiation Protection)
    - 10 CFR 20 (Standards for Protection Against Radiation)
    - Applicable Standard Operating Procedures

2. Maintain detailed knowledge and familiarity with all applicable DOE and Federal statutes, orders, rules, and regulations relating to radiological emergency response activation, deployment, and operational activities.

12/27/2005

CM/FRMAC DIRECTOR

3. Maintain knowledge and thorough understanding of FRMAC and Consequence Management Response Team (CMRT) Phase I, Phase II, and Phase III missions, capabilities, objectives, and expected products.

4. Maintain Deployment Authorization Program status including: annual physical, immunizations and medical clearance, and U.S. passport.

ACTIVATION DUTIES AND RESPONSIBILITIES

1. Overall responsibility for the health and safety of the CM/FRMAC personnel.

2. Overall responsibility for the management and execution of the all CM/FRMAC activation, deployment, operational and deactivation activities.

3. Overall responsibility for ensuring compliance with all applicable DOE Orders, OSHA standards, and Federal statutes.

4. Identify the FRMAC management team.

5. Determine the composition and skill mix of the CMRT Phase I, Phase II, and Phase III deployments.

6. Exercise management and coordination control of the FRMAC.

7. Overall responsibility for ensuring a working relationship and communications with the Coordinating Agency, effected state(s), and local officials.

8. Ensure that the CM/FRMAC activities and data products reflect the ongoing priority needs of the Coordinating Agency and state(s).

9. Ensure that the CM/FRMAC activities and data products meet the statutory responsibilities of participating Federal agencies.

10. Ensure that CM/FRMAC raw data and approved assessed data products are distributed as expeditiously as possible and in accordance with FRMAC procedures and agreements.

11. Overall responsibility for ensuring that all CM/FRMAC assessed data products which are officially released outside of the FRMAC are of known and defensible quality.

12. Overall responsibility for ensuring that all necessary physical accommodations are provided for CM/FRMAC personnel.

13. Overall responsibility for ensuring strict document control, confidentiality, and archiving of all CM/FRMAC personnel medical records, radiation exposures/doses,

CM/FRMAC DIRECTOR

industrial hygiene and/or occupational health related incidents, and/or other health issues.

14. Overall responsibility for all Federal government equipment located at the FRMAC, FRMAC data and data products, radioactive sources, classified information and critical assets.

15. Overall responsibility for ensuring that all handling, packaging, storing, and shipping of hazardous materials, radioactive substances, and mixed waste are in compliance with all applicable DOE Orders, OSHA and DOT standards, and Federal regulations.

16. Overall responsibility for ensuring that all required DOE and Federal government documentation are complete, accurate, timely, and properly archived for historical and legal purposes.

17. Ensure the development of timely and appropriate Situational Reports.

18. In concert with the Coordinating Agency and the state(s), determine the extent, composition, capability, and time line for additional consequence management assets.

19. In accordance with the NRP and the Nuc/Rad Annex and in conjunction with the U.S. Environmental Protection Agency (EPA) Senior Official, the Coordingating Agency, and the state(s) develop a formal transition plan for transitioning the management and coordination of the FRMAC from DOE to EPA.

20. In conjunction with the EPA Senior Official, ensure a smooth seamless transition of the FRMAC management for DOE to EPA.

CLOSE-OUT DUTIES AND RESPONSIBILITIES

1. In concert with the Coordinating Agency and the state(s), determine all required operations, activities, and documentation required to bring the deployment to completion.

2. Overall responsibility for the safe return of the CM/FRMAC personnel, Federal government equipment, and critical assets.

3. Overall responsibility for ensuring all handling, packaging, storing, and shipping of hazardous materials, radioactive substances, and mixed waste are in compliance with all applicable DOE Orders, OSHA and DOT standards, and Federal regulations.

CM/FRMAC DIRECTOR

4. Overall responsibility for the adherence to all applicable DOE Orders, OSHA standards, EPA regulations, and other Federal regulations for transitioning the CM/FRMAC site to the receiving authority.

5. Overall responsibility for ensuring strict document control, confidentiality, and archiving of all FRMAC personnel medical records, radiation exposures/doses, industrial hygiene and/or occupational health related incidents, and/or other health issues.

6. Overall responsibility for the proper disposition of all classified documentation.

7. Document the chronology of significant events, meetings, and activities.

8. Document CM/FRMAC activities, accomplishments, lessons learned, and any other significant occurrences.

9. Ensure the development of a comprehensive and timely final report of the CM/FRMAC activities.

10. Provide close-out documentation, as required.

11. Responsible for the disposition of all self-generated notes, logs, and mission-related documentation.

ORGANIZATION AND COMMUNICATIONS:

RECEIVES DIRECTION FROM:
Manager, NNSA/NSO
DOE/NNSA/HQ
Lead Coordinating Agency On-Scene Commander
Senior Officials from affected states

PROVIDES DIRECTION TO:
CM/FRMAC Personnel

QUALIFICATIONS:

- Senior NNSA/NSO official
- "Q" security clearance.
- Demonstrated ability to manage emergency response personnel in very stressful, urgent situations.
- Demonstrated detailed knowledge and familiarity with all applicable DOE and Federal statutes, orders, rules, and regulations relating to FRMAC and radiological emergency response activation, deployment, and operational activities.

CM/FRMAC DIRECTOR

- Experience and thorough understanding of CM Phase I, II, and III and FRMAC missions, resources, capabilities, objectives, operations, and expected data products.
- Successfully complete all required CM training.
- Deployment Authorization Program qualified.

OPERATIONS MANAGER

POSITION SUMMARY:

The Operations Manager assists and advises the FRMAC Director in implementing and executing all phases of CM/FRMAC activities and field operations and coordinating the use of FRMAC resources. The Operations Manager advises the FRMAC Director on staff and emergency functions and the implementation and status of priorities, activities, requests, and events. The Operations Manager is responsible for the internal operations of the FRMAC including the data flow and the FRMAC data products. In addition, the Operations Manager is responsible for executing and coordinating resources and activities both internal and external to the FRMAC.

DUTIES AND RESPONSIBILITIES:

PREACTIVATION DUTIES AND RESPONSIBILITIES

1. Maintain knowledge and familiarity with all applicable DOE, Federal Communications Commission (FCC), Department of Transportation (DOT), Occupational Safety and Health Administration (OSHA) regulations and orders.

2. Maintain detailed knowledge and familiarity with all applicable DOE and Federal statutes, orders, rules, and regulations relative to the *National Response Plan* and the *Nuclear/Radiological Incident Annex*, December 2004.

3. Maintain knowledge and thorough understanding of FRMAC Phase I, II, and III missions, capabilities, objectives, and expected products.

4. Maintain knowledge and understanding of FRMAC positions, duties, responsibilities, and qualifications.

5. Maintain familiarity with the NNSA/NSO and RSL Alert, Activation, and Deployment policies, procedures, and activities.

6. Maintain Deployment Authorization Program qualifications.

ACTIVATION DUTIES AND RESPONSIBILITIES

1. Assist the FRMAC Director in ensuring that all applicable DOE Orders, OSHA standards, Federal statutes, and Department of State (DOS) rules and regulations are not violated.

2. Assist the FRMAC Director in selecting the FRMAC management team.

3. Assist the FRMAC Director in defining the composition of CMRT I, CMRT II, and CMRT III teams.

12/27/2005

OPERATIONS MANAGER

4. Assist and advise the FRMAC Director in implementing and executing FRMAC activities and field operations.

5. Manage the internal operations of all phases of the FRMAC.

6. In consultation with the FRMAC Health and Safety Manager, ensure that the radiological exposure and associated risks for FRMAC personnel are As Low As Reasonably Achievable (ALARA) for all FRMAC operations.

7. Responsible for ensuring the efficient and effective utilization of available resources to meet the ongoing priority needs of the Coordinating Agency and the state(s).

8. Responsible for the internal data flow and the timely production of all data products ensuring they are of known and acceptable quality and meet FRMAC requirements.

9. Ensure effective implementation of DOE resources in coordination with other Federal agencies.

10. Brief the FRMAC Director on the status of the DOE response and the availability of resources.

11. Responsible for the documentation, tracking, and status of requests for event-related information and consequence management activities.

12. Ensure the development of the periodic Situational Reports for NNSA/NSO and NNSA/HQ.

13. Ensure that all handling, packaging, storing, and shipping of hazardous materials, radioactive substances, and mixed waste are in compliance with all applicable DOE Orders, OSAH and DOT standards, and Federal regulations.

14. Assist the FRMAC Director in facilitating the external FRMAC communications.

15. Assist the FRMAC Director in ensuring a smooth and seamless transition of the FRMAC management from DOE/NNSA to EPA. This includes developing plans and procedures to transfer Operation's logs, records, and documentation to the U.S. Environmental Protection Agency (EPA).

CLOSE-OUT DUTIES AND RESPONSIBILITIES

1. Ensure all FRMAC-related operations, activities, and documentation are completed and brought to closure.
2. Assist the FRMAC Director in facilitating the safe return of all FRMAC personnel, Federal government equipment, and critical assets.
3. Ensure the proper disposition of all classified documentation.
4. Ensure archiving and preservation of all FRMAC documents and databases.

OPERATIONS MANAGER

5. Ensure strict document control, confidentiality, and archiving of all FRMAC personnel's medical records, radiation exposure/doses, industrial hygiene and/or occupational health related incidents and/or other health issues.

6. Document the chronology of significant events, meetings, and activities.

7. Ensure all handling, packaging, storing, and shipping of hazardous materials, radioactive substances, and mixed waste are in compliance with all applicable DOE Orders, OSHA, and DOT standards, and Federal regulations.

8. Ensure adherence to all applicable DOE Orders, OSHA standards, DOS regulations and other Federal regulations for transitioning the FRMAC site to the receiving authority.

9. Document FRMAC activities, accomplishments, lessons learned, and any other significant occurrences and ensure that a final report of FRMAC activities is developed.

10. Provide close-out documentation, as required.

ORGANIZATION AND COMMUNICATIONS:

RECEIVES DIRECTION FROM:
FRMAC Director
Deputy FRMAC Director

PROVIDES DIRECTION TO:
FRMAC personnel

QUALIFICATIONS:

- Senior NNSA/NSO Official.
- Demonstrated ability to manage emergency response personnel in very stressful, urgent situations.
- Demonstrated detailed knowledge and familiarity with all applicable DOE and Federal statutes, orders, rules, and regulations relating to FRMAC and radiological emergency response activation, deployment, and operational activities.
- Experience and thorough understanding of CM/FRMAC Phase I, II, and III missions, resources, capabilities, objectives, operations, and expected data products.
- "Q" Security Clearance.
- Successfully complete all required CM training.
- Deployment Authorization Program qualified.

EPA SENIOR OFFICIAL

POSITION SUMMARY:

The U.S. Environmental Protection Agency (EPA) Senior Official collocated at the FRMAC is NOT a FRMAC position under the direction of the FRMAC Director. This job description addresses the EPA Senior Official from the perspective of the FRMAC during the emergency phase while the FRMAC is under the management of DOE.

Following the stabilization of the emergency and during the intermediate phase of a CONUS deployed FRMAC, the management responsibilities for the FRMAC will transition from DOE to EPA. This transition will occur at a mutually agreeable time with the DOE and EPA and in coordination with the Coordinating Agency and the impacted state(s). The EPA will assume the Federal responsibility for coordinating the intermediate and long-term off-site radiological monitoring, sampling, and dose assessment activities and the EPA Senior Official will transition to become the FRMAC Director.

While the FRMAC is under the management of the DOE, the EPA Senior Official provides guidance to the FRMAC Director concerning EPA Protective Action Guides and ensures that the data collected by the FRMAC contains the necessary information required by the EPA for the development of the Long-Term Monitoring Plan and to conduct the long-term monitoring, reentry, and recovery operations. In addition, the EPA Senior Official works closely with the FRMAC Director and is cognizant of all major decisions and activities executed by the FRMAC. In this way, the EPA Senior Official possesses the background information and experience in the evolution of the FRMAC necessary for a smooth transition in assuming the role of FRMAC Director.

DUTIES AND RESPONSIBILITIES:

PREACTIVATION DUTIES AND RESPONSIBILITIES

1. Maintain detailed knowledge and familiarity with all applicable EPA, DOE, Federal statutes, orders, rules and regulations relating to the National Response Plan (NRP) and the Nuclear/Radiological Annex, FRMAC, and radiological emergency response activation, deployment, and operational activities.

2. Maintain knowledge and thorough understanding of FRMAC mission, capabilities, and objectives.

3. Maintain knowledge and understanding of various CM/FRMAC positions, duties, responsibilities, and desired qualifications.

4. Maintain working knowledge and expertise with EPA's Protective Action Guides.

12/27/2005

EPA SENIOR OFFICIAL

ACTIVATION DUTIES AND RESPONSIBILITIES

1. Provide guidance to the DOE/NNSA FRMAC Director concerning interpretation of the EPA's Protective Action Guides.

2. Work closely with the FRMAC Director and remain cognizant of the evolution of the FRMAC: what directives have been provided to the FRMAC; what agreements have been made with the Coordinating Agency and the states; and familiarity with all major decisions and activities executed by the FRMAC.

3. Ensure that the data collected by the FRMAC contains the necessary information required by EPA to support the development of the Long-Term Monitoring Plan and conduct long-term monitoring, reentry, and recovery operations.

4. Assist in the development of the FRMAC Long-Term Monitoring Plan.

5. Ensure the development of appropriate documentation to support the transition of the FRMAC management from DOE to EPA.

6. In accordance with the Nuclear/Radiological Annex of the National Response Plan, and in conjunction with the DOE FRMAC Director, the Coordinating Agency and the state(s), develop a formal transition plan for transitioning the management and coordination of the FRMAC from DOE to EPA.

7. In conjunction with the DOE FRMAC Director, ensure a smooth seamless transition of the FRMAC management from DOE to EPA.

CLOSE-OUT DUTIES AND RESPONSIBILITIES

N/A - The deactivation of the FRMAC under EPA management and coordination is outside the purview of this document.

ORGANIZATION AND COMMUNICATIONS:

RECEIVES DIRECTION FROM:
EPA/HQ – Office of Radiation and Indoor Air
Coordinating Agency On-Scene Commander
Senior Officials from effected states

PROVIDES DIRECTION TO:
N/A

QUALIFICATIONS:

- Senior EPA official
- "Q" security clearance.

EPA SENIOR OFFICIAL

- Demonstrated ability to manage emergency response personnel in very stressful, urgent situations.
- Demonstrated detailed knowledge and familiarity with all applicable EPA and Federal statutes, orders, rules, and regulations relating to FRMAC and radiological emergency response activation, deployment, and operational activities.
- Experience and thorough understanding of CM/FRMAC Phase I, II, and III missions, resources, capabilities, objectives, operations, and expected data products.
- Successfully complete all required CM training.

SENIOR SCIENTIFIC ADVISOR

POSITION SUMMARY:

The FRMAC Senior Scientific Advisor (SSA) is a recognized national expert in radiation health effects, the impact of radiation on the environment, and the transport of radioactive materials in the biosphere. The SSA is the senior technical advisor to the FRMAC Director and will provide him/her with assessments of the offsite radiological situation, a technical overview of FRMAC activities, and advice and assistance in determining the best technical and scientific basis for operational activities to meet overall FRMAC objectives. The SSA provides technical advice to the Coordinating Agency, state, and local officials as requested. In addition, the SSA functions as the FRMAC technical spokesperson at briefings for the Coordinating Agency, state and local officials, news media, and/or the public.

DUTIES AND RESPONSIBILITIES:

PREACTIVATION DUTIES AND RESPONSIBILITIES

1. Maintain expert working knowledge and experience in his/her specific field.

2. Maintain expert knowledge and experience with respect to radiological dose assessment, radiation-related health effects and environmental impact, transport of radioactive materials in the biosphere, Federal Protective Action Guides (PAGs), mitigation processes, and consequence management activities.

3. Maintain familiarity and working knowledge of current International Atomic Energy Agency radiological emergency intervention levels.

4. Maintain in-depth knowledge and experience with the all the current FRMAC manuals, including: the *FRMAC Assessment Manual*; the *FRMAC Health and Safety Manual*; and the *FRMAC Operations Manual.*

5. Maintain familiarity with the *National Response Plan* and the *Nuclear/Radiological Incident Annex*, December 2004.

6. Maintain familiarity with the NNSA/NSO Alert, Activation, and Deployment policies, procedures, and activities.

7. Maintain a working knowledge and understanding of CMRT Phase I, II, and III and FRMAC missions, capabilities, objectives, and procedures.

8. Maintain Deployment Authorization Program qualifications.

12/27/2005

SENIOR SCIENTIFIC ADVISOR

ACTIVATION DUTIES AND RESPONSIBILITIES

1. Function as the senior on-scene technical advisor to the FRMAC Director.

2. Provide technical overview and assessments of the FRMAC operations and activities.

3. Provide the FRMAC Director with interpretations of the scientific and technical information, technical options, estimates of risks and benefits, and recommended courses of action.

4. Provide advice with respect to technical activities to meet the overall FRMAC objectives that reflect the Coordinating Agency's and state's prioritized requirements.

5. As requested, provide advice and interpretations of the scientific and technical information, technical options, and estimates of risks and benefits to the Coordinating Agency and/or state and local officials.

6. Function as the FRMAC technical spokesperson at briefings for the Coordinating Agency, state and local officials, news media, and/or the public.

7. Serve as the FRMAC scientific contact with other Federal and state agencies.

8. Assist the FRMAC Director in ensuring smooth, seamless transition of the FRMAC management from DOE to EPA. This includes developing plans and procedures for transferring the Senior Scientific Advisor's logs, records, and documentation to EPA.

CLOSE-OUT DUTIES AND RESPONSIBILITIES

1. Provide advice and assistance in determining all required operations, activities, and documentation required to bring the deployment to completion.

2. Document the chronology of significant events, meetings, and activities.

3. Document FRMAC activities, accomplishments, lessons learned, and any other significant occurrences.

4. Provide detailed input into the development of a comprehensive final report of the FRMAC activities.

5. As requested, provide assistance in preparing and/or reviewing general population radiation exposure documentation, health effects reports and/or other FRMAC-related reports.

SENIOR SCIENTIFIC ADVISOR

6. Responsible for the disposition of all self-generated notes, logs, and mission-related documentation.

ORGANIZATION AND COMMUNICATIONS:

RECEIVES DIRECTION FROM:
FRMAC Director
Deputy FRMAC Director

PROVIDES DIRECTION TO:
N/A

QUALIFICATIONS:

- Recognized national expert in radiation health effects, the impact of radiation on the environment, and the transport of radioactive materials in the biosphere.
- Demonstrated and expert knowledge and experience in radiological dose assessment, radiation-related health effects and environmental impact, protective action guides (PAGs), mitigation processes, and consequence management activities.
- Working knowledge and experience with Federal PAGs and the International Atomic Energy Agency's (IAEA's) intervention levels.
- Demonstrated in-depth knowledge and experience in the application and use of the *FRMAC Assessment Manual* and the *FRMAC Health and Safety Manual*.
- Experience and thorough understanding of CM/FRMAC Phase I, II, and III missions, resources, capabilities, objectives, operations, and expected data products.
- "Q" Security Clearance.
- Successfully complete all required CM training.
- Deployment Authorization Program qualified.

LIAISON OFFICER

POSITION SUMMARY:

The CM/FRMAC Liaisons coordinate requests, information, and data products between the CM/FRMAC and their point-of-contact at the deployed location. These deployed locations may be associated with the Coordinating Agency's (CO's) Joint Field Office (JFO); State(s)', counties'; and/or cities' emergency operations centers (EOCs); the facility's Emergency Operations Facility (EOF); or various other Federal, State, and county locations. The Liaisons ensure timely transmittal of event related information and data products to and from the Coordinating Agency, State(s), facility, and participating Federal agencies. The Liaisons facilitate the resolution of problems, conflicts, and unmet needs.

DUTIES AND RESPONSIBILITIES:

PREACTIVATION DUTIES AND RESPONSIBILITIES

1. Maintain knowledge of and familiarity with CM/FRMAC documentation and applicable Federal regulations.

2. Maintain knowledge and thorough understanding of CMRT II/FRMAC missions, capabilities, and objectives.

3. Maintain familiarity and working knowledge of current Federal radiological emergency response Protective Action Guides (PAGs). This includes PAGs for evacuation, relocation, and ingestion.

4. Maintain detailed knowledge, understanding, and experience with CMRT II/FRMAC data products.

5. Maintain currency in required CM training classes as identified on the training template for this position.

6. Maintain Deployment Authorization Program status including: annual physical, immunizations and medical clearance, and U.S. passport

ACTIVATION DUTIES AND RESPONSIBILITIES

1. Provide direct communication between the deployed location and the CM/FRMAC Director.

12/27/2005

LIAISON OFFICER

2. Ensure the timely distribution to the Point-of-Contact of event related information and CM/FRMAC data products received from the CM/FRMAC Director.

3. Provide interpretations/explanations of CM/FRMAC data products to the Point-of-Contact and others as appropriate.

4. Perform data entry and data management of all CM field monitoring and derived radioanalytical data, source-term information, onsite radiological situation information, and other incident related information required by the ERDS Data Center application.

5. Assist in ensuring and maintaining the technical integrity of all CM data and data products.

6. Assist in the date and time stamping, cataloging, and archiving of all original CM/FRMAC documents relating to the response, data, data products, any parameters effecting the quality or integrity of the their data or data products, and any other related data forms and/or information.

7. Manage the event log, and data tracking system.

8. Produce pre-defined reports as requested.

9. Interact with GIS to transfer the desired data sets from the Data Center to GIS.

10. Assist the Data Center supervisor in the managing the Data Center.

CLOSE-OUT DUTIES AND RESPONSIBILITIES

1. Responsible for the completion of all database related duties and activities required to bring the deployment to closure and to redeploy.

2. As directed, assist in the transfer of Data Center records to other design agencies.

3. Provide data reports for incident final report and other documentation and data assessments as requested.

4. Assist in ensuring the integrity, packaging, and proper deposition of all archived original hard copies of CM/FRMAC documents relating to the CM/FRMAC response, data, data products, any parameters effecting the quality or integrity of their data or data products, and any other related data forms and/or information.

5. Upon deactivation, assist in the containerization and preparation for the redeployment and transportation of all ERDS related computers and equipment.

LIAISON OFFICER

6. Per instructions, responsible for the disposition of all self-generated notes, logs, and mission related documentation.

7. Document lessons learned.

ORGANIZATION AND COMMUNICATIONS:

RECEIVES DIRECTION FROM:

CM/FRMAC Director (and Deputy)
Operations Manager (and Deputy)
Assessment Manager (and Deputy)

PROVIDES DIRECTION TO:
Document Control Specialist
GIS Specialist

QUALIFICATIONS:

- "Q" security clearance.
- Demonstrated in-depth knowledge and experience in the application and use of the *FRMAC Assessment Manual.*
- Demonstrated expert knowledge and experience in radiological dose assessment, radiation-related health effects and environmental impact, PAGs, mitigation processes, and consequence management activities.
- Working knowledge and experience with Federal PAGs and IAEA's intervention levels.
- Successfully complete all required CM training.
- Experience and thorough understanding of CM missions, resources, capabilities, objectives, operations, and expected data products.
- Deployment Authorization Program qualified.

FRMAC PUBLIC INFORMATION OFFICER

POSITION SUMMARY:

The FRMAC does not release information directly to the public. The Coordinating Agency is responsible for information on the status of the overall Federal response, specific Coordinating Agency response activities, and the status of on-site conditions. The Coordinating Agency will develop joint information procedures for providing Federal information to, and for obtaining information from, all Federal agencies participating in the response including the FRMAC. The Coordinating Agency will establish the Joint Information Center (JIC) under the direction of the Incident Commander on scene to coordinate the development of public information. Participants in the JIC include the Coordinating Agency, state, local, facility owner/operator, FRMAC, and other information sources. In some emergency situations, it may be necessary to release public information prior to the establishment of the JIC. In these instances, information releases will be coordinated through the Incident Commander. For OCONUS deployments, all contact with the news media and informational releases to the public will be coordinated through the Department of State (DOS).

The FRMAC Public Information Officer (PIO) is appointed by the FRMAC Director in consultation with the Director, Office of Public Affairs, NNSA/NSO. The PIO is an expert on public affairs. The Public Affairs group is responsible for advising the FRMAC Director on all activities associated with the news media and dissemination to the public of information related to FRMAC activities. The PIO will interface with the JIC, interact with the Coordinating Agency, state, and local PIO's; develop public information materials relating to FRMAC activities; assist in the development of briefing materials; develop FRMAC Fact Sheets; and coordinate requested tours of the FRMAC facility.

DUTIES AND RESPONSIBILITIES:

PREACTIVATION DUTIES AND RESPONSIBILITIES

1. Maintain detailed knowledge, expertise, and proficiency with all phases of public affairs as it relates to FRMAC and DOE emergency response programs.

2. Maintain detailed knowledge and familiarity with all applicable DOE Orders, rules, and regulations relating to public information activities and the dissemination of information to the public and the media.

3. Maintain in-depth expertise in NNSA/NSO Public Affairs activities.

4. Maintain knowledge and experience of news media processes and activities.

5. Maintain highly developed writing skills.

12/27/2005

FRMAC PUBLIC INFORMATION OFFICER

6. Maintain highly developed oral communications skills.

7. Maintain knowledge and thorough understanding of FRMAC and Consequence Management Response Team (CMRT) Phase I, Phase II, and Phase III missions, capabilities, and objectives.

8. Maintain NNSA/NSO Alert, Activation, and Deployment policies, procedures, and activities.

9. Maintain Deployment Authorization Program status including: annual physical, immunizations and medical clearance, and U.S. passport.

ACTIVATION DUTIES AND RESPONSIBILITIES

1. Advise and support the FRMAC Director in all public information, news media, and briefing issues.

2. Assist in the development of public information briefings and briefing materials to be presented by the FRMAC Director at news briefings and public meetings.

3. Function as the liaison between the FRMAC and the JIC.

4. Interface with the Coordinating Agency, state, and local PIOs.

5. If OCONUS, interface and coordinate with the DOS.

6. Coordinate public affairs information with DOE/NNSA/HQ and NNSA/NSO.

7. Develop public information materials as required.

8. Coordinate tours of the FRMAC facility for the news media and/or public officials.

9. Develop FRMAC Fact Sheets, in coordination with the JIC, to address FRMAC activities and accomplishments.

10. At the beginning of each shift provide FRMAC Field Monitoring Teams with a briefing regarding how the team should address inquiries from the public and/or the media and copies of FRMAC fact sheet sheets to provide contact information for appropriate individuals that the public or news media can contact for further information.

11. Document all public affairs related news briefings, public meetings, major decisions, and communications.

12. Provide, operate, and maintain public affairs audio/visual equipment.

FRMAC PUBLIC INFORMATION OFFICER

13. Assist the FRMAC Director in ensuring a smooth seamless transition of the FRMAC management from DOE to EPA. This includes developing plans and procedures to transfer Public Affairs logs, records, and documentation to EPA.

CLOSE-OUT DUTIES AND RESPONSIBILITIES

1. Responsible for the completion of all public affairs-related duties, activities, and documentation required to bring the deployment to closure.

2. Coordinate the cessation of FRMAC operations from the public affairs perspective with the JIC, DOE/NNSA/HQ, and NNSA/NSO.

3. Responsible for the archiving of all public affairs-related documentation.

4. Responsible and accountable for the containerization, storage, and redeployment of all public affairs-related equipment.

5. Per instructions, responsible for the disposition of all self-generated notes, logs, and mission-related documentation.

ORGANIZATION AND COMMUNICATIONS:

RECEIVES DIRECTION FROM:

Coordinating Agency On-Scene Commander
FRMAC Director
FRMAC Deputy Director
FRMAC Operations Manager
Director, Public Affairs and Information Division, NNSA/NSO
DOE/HQ
If OCONUS, senior officials from DOS in coordination with the FRMAC Director

PROVIDES DIRECTION TO:

N/A

QUALIFICATIONS:

- Recognized Public Affair expert.
- "Q" security clearance.
- Demonstrated ability to communicate orally and in writing.
- Thorough knowledge and experience of news media processes and activities.
- Demonstrated expertise in developing emergency response-related briefing materials for presentation to the news media and/or the public.
- Successfully complete all required CM training.

OPERATIONS SPECIALIST

POSITION SUMMARY:

The Operations Specialist carries out initial logistical operations for Phase I and II of the Consequence Management response and is also responsible for maintaining the operational flow of activities required to support the deployment including, requisitioning and coordinating on-going logistical requirements (lodging, rations, transportation, fuel, material purchases, etc.) during the period of the FRMAC.

During Phase III, in addition, to overseeing the logistical requirements described above, the Operations Specialist also oversees the activities of the communications and mechanical/electrical support personnel to ensure that operational capability is maintained.

DUTIES AND RESPONSIBILITIES:

PREACTIVATION DUTIES AND RESPONSIBILITIES

1. Maintain familiarity with Remote Sensing Laboratory (RSL) Alert, Activation, and Deployment policies, procedures, and activities.

2. Maintain a working knowledge and understanding of CM mission, capabilities, objectives, and procedures.

3. Maintain qualification for the transportation of radioactive calibration sources.

4. Maintain familiarity with CM field monitoring and environmental sampling equipment.

5. Maintain knowledge and experience with the accountability and audit requirements for DOE equipment and sensitive assets.

6. Maintain Deployment Authorization Program status including: annual physical, immunizations and medical clearance, and U.S. passport.

7. Maintain currency on the CMRT training courses identified in the training template for this position.

ACTIVATION DUTIES AND RESPONSIBILITIES

1. Responsible for establishing and maintaining the operational capability of the CM facility.

12/27/2005

OPERATIONS SPECIALIST

2. Ensure the availability of adequate communications and rental vehicles.
3. Obtain equipment, materials, supplies, and services, as required by the operation.
4. Obtain transportation for personnel and equipment.
5. Responsible for all DOE sensitive assets.
6. Responsible for all classified communications and documentation.
7. Responsible for ensuring that all support documentation required by DOE or BN is complete, accurate, and timely.
8. Responsible for providing a summary of all support-related activities to the periodic Situation Reports.
9. Responsible for preparing for the arrival of additional or replacement personnel or equipment.
10. Ensure the availability of mechanical/electrical support, when appropriate.

CLOSE-OUT DUTIES AND RESPONSIBILITIES

1. Ensure the availability of all operational and logistical support required to deactivate the Consequence Management activities and redeploy.
2. Prepare documents and coordinate redeployment of equipment and personnel.
3. Document all assets that will remain to support the FRMAC facility while under EPA management including a plan for how and when these assets will be returned to DOE.
4. Responsible for the containerization, storage, and/or redeployment of all CM equipment and DOE sensitive assets.
5. Provide support for packing, storing, and shipping hazardous materials, radioactive substances, and mixed waste.
6. Document the chronology of significant events, meetings, and activities.
7. Document deployment activities, accomplishments, lessons learned, and any other significant occurrences.
8. Responsible for the proper disposition of all classified documentation.
9. Provide close-out documentation, as required.

OPERATIONS SPECIALIST

ORGANIZATION AND COMMUNICATIONS:

RECEIVES DIRECTION FROM:

CM/FRMAC Director (and Deputy)
Operations Manager (and Deputy)
Assessment Scientist

PROVIDES DIRECTION TO:
Communications Specialists
Mechanical/Electrical Specialists

QUALIFICATIONS:

- "Q" security clearance.
- Demonstrated ability to function as in a "Support Manager" role in very stressful, urgent situations.
- Knowledge and familiarity with all applicable DOE, OSHA, and DOT regulations, and orders.
- Working knowledge and experience with Federal PAGs and IAEA's intervention levels.
- Successfully complete all required CM training.
- Experience and thorough understanding of CM missions, resources, capabilities, objectives, operations, and expected data products.
- Deployment Authorization Program qualified.

MONITORING MANAGER

The Monitoring Manager coordinates and directs all FRMAC activities in the emergency and intermediate phase of the response relating to aerial radiological monitoring, field monitoring, sampling, and radioanalysis (mobile and institutional laboratories). The Monitoring Manager is responsible for the safety of all FRMAC personnel and maintains all radiation exposures to "As Low As Reasonably Achievable" (ALARA). In coordination with the Assessment Manager, the Monitoring Manager evaluates the requirements for field monitoring, environmental sampling, and radioanalytical data and develops priorities, strategies, and plans to acquire the data. The Monitoring Manager is responsible for identifying equipment, personnel, and resource requirements and coordinating their availability. The Deputy Monitoring Manager performs all the Monitoring Manager's functions in his/her absence or during second shift operations.

DUTIES AND RESPONSIBILITIES:

PREACTIVATION DUTIES AND RESPONSIBILITIES

1. Maintain detailed knowledge and expertise with a broad spectrum of radiological field monitoring and health physics instrumentation including FIDLER's and *In-situ* high resolution gamma spectrometry systems.

2. Maintain currency and detailed knowledge and expertise with a broad spectrum of radioanalytical procedures, instrumentation, and methodologies.

3. Maintain detailed knowledge, expertise, and proficiency with all phases of radiological monitoring, environmental sampling, and radioanalytical methodologies as identified in the FRMAC *Monitoring and Analysis Manual*, Volume 1 - *Radiation Monitoring and Sampling* and Volume 2 - *Sample Preparation and Analysis*.

4. Ensure that Emergency and Intermediate Phase field monitoring, sampling, and radioanalytical methodologies reflect technically sound and scientifically accepted practices and procedures.

5. Maintain knowledge and familiarity with the FRMAC *Health and Safety Manual*.

6. Maintain knowledge and experience with radiological contamination control and decontamination procedures.

7. Maintain currency on CMRT Training Courses.

8. Maintain currency on the Occupational Safety and Health Act 40-hour Hazardous Waste Operations and Emergency Response Course (OSHA Title 29 CFR 1910.120).

12/27/2005

MONITORING MANAGER

9. Maintain knowledge and familiarity with 10 CFR 835 (Occupational Radiation Protection).

10. Maintain DOE Rad Worker II Certification.

11. Maintain Full Face Respirator Certification.

12. Maintain required personnel protective equipment to include self-contained breathing apparatus and Level A and B protective clothing.

13. Maintain CPR certification.

14. Maintain familiarity with the Remote Sensing Laboratory (RSL) Alert, Activation, and Deployment policies, procedures, and activities.

15. Maintain a working knowledge and understanding of Consequence Management missions, capabilities, objectives, and procedures.

16. Maintain Deployment Authorization Program status including: annual physical, immunizations and medical clearance, and U.S. passport.

ACTIVATION DUTIES AND RESPONSIBILITIES

1. Responsible for the safety of all FRMAC Monitoring Personnel.

2. In concert with the Health and Safety Manager, ensure that the principle of ALARA is practiced during all possible radiation exposure activities.

3. In consultation with NNSA/NSO management and the RSL Emergency Response Manager, identify instrumentation, equipment, and personnel to deploy to the emergency site.

4. Develop initial Monitoring and Sampling Plan based upon State, local, and Coordinating Agency priorities and concerns.

5. In concert with the Consequence Management Official, establish and maintain a working interface with representatives from the Coordinating Agency and the affected State(s) concerning monitoring and radioanalytical issues.

6. Maintain flexibility and adjust monitoring activities to reflect changing FRMAC priorities, requirements, and data quality objectives.

7. Identify and develop plans to integrate available field monitoring personnel from the Coordinating Agency, State, local, and/or other emergence response organizations into FRMAC monitoring activities.

MONITORING MANAGER

8. Identify additional resources required including monitoring and radioanalytical resources and personnel.

9. Ensure adequate maps are available for the Field Team Specialists.

10. Identify how Field Monitoring Specialists can pass through roadblocks into evacuated areas to perform monitoring duties.

11. Identify local emergency response personnel who are familiar with the area and who are available to drive the monitoring vehicles.

12. In consultation with the Assessment Manager and/or the FRMAC Senior Scientific Advisor, evaluate the requirements and data quality objectives for field monitoring, environmental sampling, and radioanalytical data and develop priorities, strategies, and plans to acquire the monitoring and radioanalytically derived data.

13. In concert with the Health and Safety Manager, ensure that the Field Team Specialists have appropriate personal dosimetry, instructions on its use, and understand exposure reporting and documentation requirements.

14. In concert with the Health and Safety Manager, ensure the Field Team Specialists receive a Mission and Safety Briefing prior to each field operation. These briefings will address operational objectives, possible radiation exposures and related turn back values and dose commitment levels, required personal dosimetry (direct reading and non-direct reading), radiation exposure reporting and documentation requirements, meteorological hazards, general safety issues, and any other hazards which may exist.

15. In concert with the Public Information Officer (PIO) and as part of the Field Team Specialists' Mission and Safety Briefing, ensure the Field Team Specialists receive:

    - A briefing at the beginning of each shift to explain the emergency response and consequence management information that has been disseminated to the public and how the teams should address inquires from the public and/or the media.

    - Current CMFRMAC Fact Sheets suitable for the CM/FRMAC monitoring teams to give to the inquiring public and/or media. In addition to information relating to the CM/FRMAC activities, the Fact Sheets will contain names and telephone numbers of appropriate individuals that the public or news media can contact for information such as the JIC Chief, FRMAC PAO, and other appropriate individuals.

16. Ensure that all field monitoring and derived radioanalytical data are of known quality and meet CM/FRMAC requirements and data quality objectives.

MONITORING MANAGER

17. Ensure Chain-of-Custody procedures for all collected samples and documentation are maintained.

18. Provide radiological field monitoring training, as requested, to local responders.

19. Ensure accurate and complete documentation of all field monitoring, sample collection, sample analyses, and health physics activities are maintained.

20. Ensure effective and appropriate command and control of the CM/FRMAC field monitoring teams.

21. Provide support as required for health physics monitoring and contamination control activities.

22. Assist the FRMAC Director in ensuring a smooth and seamless transition of FRMAC management from the Department of Energy to the U.S. Environmental Protection Agency (EPA). This includes developing plans and procedures to transfer the Monitoring Division's logs, records, and documentation to the EPA.

CLOSE-OUT DUTIES AND RESPONSIBILITIES

1. Responsible for the completion of all monitoring, radioanalytical, and documentation duties and activities required to complete FRMAC priorities and requirements.

2. Document appropriately all Monitoring Division assets that will remain to support the FRMAC while under EPA management and how and when the DOE assets will be returned to DOE.

3. Prepare detailed documentation of monitoring, sampling, radioanalytical, health physics, and training activities, as requested.

4. Archive all FRMAC monitoring, sampling, health physics, chain-of-custody, and quality control/assurance forms, per instruction.

5. In consultation with the Assessment Scientist, identify samples to be retained and ensure retained samples are correctly packaged and shipped to an archival facility or laboratory for further analyses.

6. Ensure that all waste, hazardous materials, radioactive substances, and mixed waste generated and/or located within the Monitoring Group are handled, packaged, stored, shipped, and/or discarded in compliance with all applicable DOE Orders, OSHA and Department of Transportation (DOT) standards, and Federal regulations and dispose of unwanted samples in concert with the Health and Safety Manager.

MONITORING MANAGER

7. Upon deactivation, ensure the containerization and preparation for the transportation and redeployment of all DOE monitoring, sampling, and radioanalytical instrumentation and equipment.

8. Document lessons learned.

ORGANIZATION AND COMMUNICATIONS:

RECEIVES DIRECTION FROM:

CM/FRMAC Director
Operations Manager

PROVIDES DIRECTION TO:
Field Team Specialists

QUALIFICATIONS:

- Detailed and complete knowledge of radiological field monitoring and health physics instrumentation including FIDLERs and *In-situ* high resolution gamma spectrometry systems.
- Current and detailed knowledge and expertise with a broad spectrum of radioanalytical procedures, instrumentation, and methodologies.
- Detailed knowledge, expertise, and proficiency with all phases of radiological monitoring techniques and environmental sampling methodologies as identified in the FRMAC *Monitoring and Analysis Manual*, Volume 1 - *Radiation Monitoring and Sampling* and Volume 2 - *Sample Preparation and Analysis*.
- Knowledge and familiarity with the *FRMAC Health and Safety Manual*.
- Demonstrated ability to manage an emergency response field monitoring mission in very stressful, urgent situations.
- Successfully completed the Occupational Safety and Health Act 40-hour Hazardous Waste Operations and Emergency Response Course (OSHA Title 29 CFR 1910.120) and the annual refresher course.
- CPR Certified
- DOE Rad Worker II Certified
- Full Face Respirator Certified
- Certified in the use of personnel protective equipment to include self-contained breathing apparatus and Level A and B protective clothing.
- Demonstrated detailed knowledge and experience with all phases of FRMAC radiological monitoring and sampling techniques and methodologies.
- Successfully complete all required CM training courses.
- Complete understanding of basic health physics principals and practices.
- Knowledge and familiarity with contamination control and decontamination practices and procedures.

MONITORING MANAGER

- Experience and thorough understanding of CM mission, resources, capabilities, objectives, operations, and expected data products.
- Deployment Authorization Program qualified.

ASSESSMENT SCIENTIST

POSITION SUMMARY:

The Assessment Scientist is a senior scientist who is an expert on the health effects and the environmental impact resulting from exposure to ionizing radiation. He/she will help state and local authorities with determining radioactive dose assessment, Federal Protective Action Guides (PAGs), the International Atomic Energy Agency's (IAEA's) intervention levels, and remediation technologies. The Assessment Scientist develops summarized and assessed data products which include data to support the protective action decision making process, dose projections, contamination contours, and contours related to PAGs. The Assessment Scientist will also address quality assurance (QA) issues for emergency phase data and provide oversight and direction to the Geographic Information System (GIS) specialist.

DUTIES AND RESPONSIBILITIES:

PREACTIVATION DUTIES AND RESPONSIBILITIES

1. Maintain expert knowledge and experience with respect to radiological dose assessment, radiation-related health effects and environmental impact, PAGs, mitigation processes, and consequence management activities.
2. Maintain in-depth knowledge and experience with the *FRMAC Assessment Manual.*
3. Maintain knowledge, experience, and familiarity relating to the understanding and interpretation of National Atmospheric Release Advisory Capability (NARAC), Sandia National Laboratories' modeling tools, and Aerial Measuring System (AMS) data products, capabilities, and limitations.
4. Maintain familiarity with other dispersion models that a re commonly in use, such as RASCAL, HOTSPOT, and MIDAS.
5. Maintain familiarity and working knowledge of current Federal radiological emergency response PAGs. This includes PAGs for evacuation, relocation, and ingestion.
6. Maintain familiarity and working knowledge of current International Atomic Energy Agency radiological emergency intervention levels.
7. Maintain detailed knowledge and experience with FRMAC-expected data products.
8. Maintain currency in required CM training classes as identified on the training template for this position.
9. Maintain familiarity with the Remote Sensing Laboratory (RSL) Alert, Activation, and Deployment policies, procedures, and activities.\
10. Maintain a working knowledge and understanding of Consequence Management missions, capabilities, objectives, and procedures.

12/27/2005

ASSESSMENT SCIENTIST

11. Maintain Deployment Authorization Program status including: annual physical, immunizations and medical clearance, and U.S. passport.

ACTIVATION DUTIES AND RESPONSIBILITIES

1. Function as an expert with respect to radiological dose assessment, radiation-related health effects and environmental impact, PAGs, mitigation processes, and consequence management activities.
2. Function as an expert with respect to the application and use of the *FRMAC Assessment Manual.*
3. Ensure the development, technical integrity, and scientific defensibility of all CMRT summarized and assessed data products.
4. Interface with NARAC in the exchange of information and data to develop the "best" iterative predictions of deposition and dose commitments to individuals in the offsite areas.
5. Provide interpretations of the NARAC predictions.
6. Provide predictive and/or actual dose estimates for the consideration of radiological protection of CM personnel.
7. Based upon available information, provide radiological dose commitment estimates as a function of time and distance from the incident site.
8. Provide preliminary impact evaluation and dose assessment for specific situations, specific areas, and specific population groups.
9. Prepare and provide interpretations, assessments, and overviews of the impact of radiological dose as it pertains to health effects for the public and impacts on the environment.
10. Provide technical predictions relating to modifications of environmental radiation fields and dose projections caused by weathering, resuspension, structural shielding, and decontamination activities.
11. Interpret dose assessments based on actual and/or model predictions in relation to the appropriate Federal PAGs or the IAEA's intervention levels.
12. Provide technical expertise, planning, and resource information for the mitigation and recovery process.
13. Provide dose mitigation options with predictions of effectiveness to minimize dose.
14. Function as consequence management expert and technical advisor, as needed.
15. If the emergency response transitions into a FRMAC, this position may transition into the FRMAC Assessment Division.

ASSESSMENT SCIENTIST

CLOSE-OUT DUTIES AND RESPONSIBILITIES

1. Responsible for the completion of data summarization and dose assessment-related duties, activities, and documentation required to bring the deployment to closure and to redeploy.
2. Prepare data summarization, dose assessment, and environmental impact documents, as required.
3. Per instructions, archive all summarized and assessed CM data products and all supporting information and data.
4. Per instructions, responsible for the disposition of all self-generated notes, logs, and mission-related documentation.
5. Document lessons learned.

ORGANIZATION AND COMMUNICATIONS:

RECEIVES DIRECTION FROM:
FRMAC Director
Operations Manager
Assessment Manager

PROVIDES DIRECTION TO:
Emergency Response Database Specialist (ERDS)
GIS Specialist

QUALIFICATIONS:

- "Q" security clearance.
- Demonstrated in-depth knowledge and experience in the application and use of the *FRMAC Assessment Manual.*
- Demonstrated expert knowledge and experience in radiological dose assessment, radiation-related health effects and environmental impact, PAGs, mitigation processes, and consequence management activities.
- Working knowledge and experience with Federal PAGs and IAEA's intervention levels.
- Successfully complete all required CM training.
- Experience and thorough understanding of CM missions, resources, capabilities, objectives, operations, and expected data products.
- Deployment Authorization Program qualified.

HEALTH AND SAFETY MANAGER

POSITION SUMMARY:

The Health and Safety Manager is the on-scene expert on health physics issues as they relate to the CM/FRMAC personnel and impact CM/FRMAC operations. The Health and Safety Manager conducts an industrial health review of CM/FRMAC facilities to ensure the location is satisfactory for field operations and provides advice to the CM Official regarding the applicability of various health physics standards, allowable exposure and dose commitment levels, and requirements for exceeding these levels. The Health and Safety Manager produces a Health and Safety Plan to ensure that CM/FRMAC personnel radiation exposures are maintained As Low As Reasonably Achievable (ALARA) and within appropriate exposure and dose commitment guidelines. In addition, the Health and Safety Manager ensures that all CM/FRMAC operations are conducted in compliance with all applicable DOE Orders, Occupational Safety and Health Association (OSHA) standards, and other Federal regulations.

DUTIES AND RESPONSIBILITIES:

PREACTIVATION DUTIES AND RESPONSIBILITIES

1. Maintain currency and expertise on all applicable DOE Orders, OSHA standards, other federal regulations, and FRMAC documents.

2. Maintain expert working knowledge and experience in health physics and radiological dose assessment.

3. Maintain knowledge and expertise relating to health effects and environmental impact resulting from exposure to ionizing radiation and ingestion and/or inhalation of radioactive materials.

4. Maintain general knowledge and familiarity in the areas of industrial hygiene and occupational safety.

5. Maintain knowledge and experience in the handling, packaging, storing, and shipping of hazardous materials, radioactive substances, and mixed waste.

6. Maintain knowledge and familiarity with the FRMAC *Health and Safety Manual.*

7. Maintain familiarity and working knowledge of current federal radiological emergency response Protective Action Guides (PAGs). This includes guidance for emergency workers and general public PAGs for evacuation, relocation, and ingestion.

12/27/2005

HEALTH AND SAFETY MANAGER

8. Maintain familiarity and working knowledge of current International Atomic Energy Agency radiological emergency response intervention levels.

9. Maintain a general working knowledge and understanding of CM missions, capabilities, objectives, and procedures.

10. Maintain currency on the courses listed on the Consequence Management Training template for this position.

11. Maintain familiarity with RSL Alert, Activation, and Deployment policies, procedures, and activities.

12. Maintain Deployment Authorization Program status including: annual physical, immunizations and medical clearance, and U.S. passport.

ACTIVATION DUTIES AND RESPONSIBILITIES

1. On scene health physics expert. Provides health physics advice to the CM/FRMAC Director. This includes advice for possibly exceeding Federal dose guidelines for emergency workers and establishing radiation exposure turn back values and dose commitment levels for CMRT personnel.

2. In concert with the CM/FRMAC Director, Operations Manager, and the Monitoring Manager; develop radiation exposure turn back values and dose commitment levels for CMRT personnel based on mission requirements, ALARA, and applicable DOE Orders and federal regulations.

3. Dispense and document the distribution of all CMRT personal dosimetry (direct reading and non-direct reading).

4. Document all CMRT personnel radiation exposures and provide document control for all direct reading and non-direct reading dosimetry records.

5. In concert with the Monitoring Manager, ensures Field Monitoring Specialists receive a Mission and Safety Briefing prior to each field operation. These briefings will address operational objectives, possible radiation exposures and related turn back values and dose commitment levels, required personal dosimetry (direct reading and non-direct reading), radiation exposure reporting and documentation requirements, meteorological hazards, general safety issues, and any other hazards which may exist.

6. Conduct periodic walk-through of the CMRT/FRMAC looking for radiological, contamination control, industrial hygiene, and occupational safety issues

HEALTH AND SAFETY MANAGER

7. Ensure all handling, packaging, storing, and shipping of hazardous materials, radioactive substances, and mixed waste are in compliance with all applicable DOE Orders, OSHA and DOT standards, and federal regulations.

8. Provide a summary of Health and Safety activities for inclusion in the periodic Situation Reports.

9. If the emergency response transitions into a FRMAC, this position may transition into the FRMAC Health and Safety Division Manager or Deputy Manager.

CLOSE-OUT DUTIES AND RESPONSIBILITIES

1. Responsible for the completion and documentation of all duties and activities required to bring the deployment to closure and to redeploy.

2. Ensure all handling, packaging, storing, and shipping of hazardous materials, radioactive substances, and mixed waste are in compliance with all applicable DOE Orders, OSHA and DOT standards, and federal regulations.

3. Responsible for the adherence to all applicable DOE Orders, Occupational Safety and Health Association (OSHA) standards, DOS regulations, and other federal regulations for transitioning the CMRT site to the receiving authority.

4. Prepare all required radiation exposure and dose assessment documentation.

5. Maintain strict document control for all CMRT/FRMAC personnel records pertaining to radiation exposure/dose, industrial hygiene, and/or occupational health activities and/or issues.

6. Responsible for the disposition of all self-generated notes, logs, and mission related documentation as instructed.

7. Document lessons learned.

ORGANIZATION AND COMMUNICATIONS:

RECEIVES DIRECTION FROM:

CM/FRMAC Director
Operations Manager and Deputy

PROVIDES DIRECTION TO:

Monitoring Specialists who perform contamination control and hot line activities.

HEALTH AND SAFETY MANAGER

QUALIFICATIONS:

- Q Security Clearance.
- Recognized expert in the field of health physics.
- General knowledge and experience in the areas of industrial hygiene and occupational safety.
- Detailed knowledge and experience with all applicable DOE Orders, OSHA Standards, and other federal regulations.
- Detailed knowledge and experience with all aspects of FRMAC health and safety activities and the *FRMAC Health and Safety Manual.*
- Successfully completed the Occupational Safety and Health Act 40-hour Hazardous Waste Operations and Emergency Response Course (OSHA Title 29 CFR 1910.120) and the annual refresher course
- Successfully completed the CM Training courses identified on position training template.
- Familiarity with safety issues such as Fall Protection, Electrical Safety, Confined Space, and Lock Out/Tag Out.

LABORATORY ANALYSIS MANAGER

POSITION SUMMARY:

The Laboratory Analysis Manager coordinates and directs all CM/FRMAC laboratory analytical activities and maintains close coordination with mobile and fixed laboratories providing the analytical support to CM/FRMAC. The Laboratory Analysis Manager also defines data quality objectives (DQOs), analytical methods, minimum detectable activity (MDC), and prioritizes analyses and samples. He/she acts as point of contact for queries regarding the status of any sample or reprioritization and provides ES&H oversight for sample handling and mobile laboratory areas. The Laboratory Analysis Manager reviews data for accuracy and prudence and ensures that analysis results are forwarded to the database in a usable format.

DUTIES AND RESPONSIBILITIES:

PREACTIVATION DUTIES AND RESPONSIBILITIES

1. Maintain currency and expertise on all applicable DOE Orders, OSHA standards, other Federal regulations, and FRMAC documents.

2. Maintain expert working knowledge and experience in radiochemical analytical methods, laboratory operations, laboratory QA/QC, and environmental radiochemistry.

3. Maintain general knowledge and familiarity in the areas of industrial hygiene and occupational safety.

4. Maintain knowledge and experience in the handling, packaging, storing, and shipping of hazardous materials, radioactive substances, and mixed waste.

5. Maintain knowledge and familiarity with the FRMAC *Health and Safety Manual* and the *Laboratory Analysis Manual*.

6. Maintain a general working knowledge and understanding of CM missions, capabilities, objectives, and procedures.

7. Maintain currency on the courses listed on the Consequence Management Training template for this position.

8. Maintain familiarity with RSL Alert, Activation, and Deployment policies, procedures, and activities.

9. Maintain Deployment Authorization Program status including: annual physical, immunizations and medical clearance, and U.S. passport.

LABORATORY ANALYSIS MANAGER

ACTIVATION DUTIES AND RESPONSIBILITIES

1. Integrate operations with hotline operations to assure that samples are surveyed for contamination and transferred to sample receipt personnel efficiently.

2. Communicate analytical capability and capacity to the Monitoring Manager and the Assessment Manager.

3. Evaluate the analytical capabilities of laboratories. Be able to identify what analyses can be performed by identified laboratories.

4. Ensure that the laboratories receiving the samples can reach the detection limits required for assessment decisions. Ensure that the quantity of sample collected is adequate to meet detection limit requirements in a reasonable count time.

5. Monitor sample numbers and analysis types to maximize production and minimize turnaround time commensurate with DQOs. Track the sample load to each laboratory.

6. Coordinate sample identification, tracking and laboratory use with other State or local agencies involved in the event.

7. Communicate expected turnaround time for results from laboratories and communicate analytical priorities to the laboratories based on assessment requirements.

8. Activate laboratories (fixed and mobile).

9. Direct samples to the appropriate laboratory.

10. Coordinate shipment of sample for offsite analysis. If qualified, ship samples as needed.

11. Act as point of contact for queries regarding the status of any sample or reprioritization submitted through a FRMAC Action Request Form.

12. Provide environment, safety, and health oversight for sample handling and mobile laboratory areas.

13. Review data for accuracy and reasonableness.

14. Ensure that analysis results are forwarded to database in a usable format.

15. Resolve data quality issues.

LABORATORY ANALYSIS MANAGER

CLOSE-OUT DUTIES AND RESPONSIBILITIES

1. Responsible for the completion and documentation of all duties and activities required to bring the deployment to closure and to redeploy.

2. Ensure all handling, packaging, storing, and shipping of hazardous materials, radioactive substances, and mixed waste are in compliance with all applicable DOE Orders, OSHA and DOT standards, and federal regulations.

3. Responsible for the adherence to all applicable DOE Orders, Occupational Safety and Health Association (OSHA) standards, DOS regulations, and other federal regulations for transitioning the CMRT site to the receiving authority.

4. Responsible for the disposition of all self-generated notes, logs, and mission related documentation as instructed.

5. Document lessons learned.

ORGANIZATION AND COMMUNICATIONS:

RECEIVES DIRECTION FROM:

CM/FRMAC Director
Operations Manager and Deputy

PROVIDES DIRECTION TO:

Sample Control Technicians

QUALIFICATIONS:

- Q Security Clearance
- Recognized expert in the field of laboratory radiochemistry and environmental radiochemistry.
- General knowledge and experience in the areas of industrial hygiene and occupational safety.
- Detailed knowledge and experience with all applicable DOE Orders, OSHA Standards, and other federal regulations.
- Detailed knowledge and experience with all aspects of FRMAC health and safety activities and the *FRMAC Health and Safety Manual.*
- Successfully completed the Occupational Safety and Health Act 40-hour Hazardous Waste Operations and Emergency Response Course (OSHA Title 29 CFR 1910.120) and the annual refresher course.
- Maintain currency in DOT shipper certifications for radioactive material, radioactive wasted and mixed waste to include International Air Transport (IATA) endorsements.

LABORATORY ANALYSIS MANAGER

- Successfully completed the CM Training courses identified on position training template.
- Familiarity with safety issues such as Fall Protection, Electrical Safety, Confined Space, and Lock Out/Tag Out.

COMMUNICATIONS SPECIALIST

POSITION SUMMARY:

The Communications Specialist establishes and maintains all communications capabilities including: repeaters; encoded radios and radio nets; satellite communications systems; telephone systems; secure communications; facsimile machines; common carrier systems (microwave and multiplexers); and local area networks for field operations.

DUTIES AND RESPONSIBILITIES:

PREACTIVATION DUTIES AND RESPONSIBILITIES

1. Maintain expertise on all communications assets including encoded radios, repeaters, telephones, satellite communications system, common carrier system, and secure communications equipment.

2. Maintain detailed knowledge and experience with all applicable DOE, National Telecommunications Information Agency (NTIA), Occupational Safety and Health Administration (OSHA), and Bechtel Nevada rules, regulations, and orders.

3. Assist in the maintenance of capability for required communications assets.

4. Alternate custodian for all secure communications equipment.

5. Upon activation, assist in the containerization and preparation for the deployment and transportation of all communications equipment which is to be deployed.

6. Maintain a general working knowledge and understanding of CM missions, capabilities, objectives, and procedures

7. Maintain currency on the courses listed on the Consequence Management Training template for this position.

8. Maintain familiarity with RSL Alert, Activation, and Deployment policies, procedures, and activities

9. Maintain Deployment Authorization Program status including: annual physical, immunizations and medical clearance, and U.S. passport.

12/27/2005

COMMUNICATIONS SPECIALIST

ACTIVATION DUTIES AND RESPONSIBILITIES

1. Establish and/or assist in establishing all deployed communications capabilities. This includes encoded radios, repeaters, telephones, satellite communications system, common carrier system (microwave and multiplexers), secure communications equipment, facsimile machines, and local area networks.

2. Responsible for assuring that all communications assets and capabilities are supported and maintained in an operational capacity. This includes encoded radios, repeaters, telephones, satellite communications system, common carrier system (microwave and multiplexers), secure communications equipment, facsimile machines, and local area networks.

3. Establish and/or assist in establishing and maintaining secure voice, fax, and data communications.

4. Adhere to all applicable DOE, NTIA, and OSHA communications orders, rules, and regulations.

5. Function as the secure communications custodian.

6. Provide or assist in radio frequency coordination.

7. Assist in video distribution and teleconference service activities.

8. Provide input to a summary of communications activities to be included in the periodic Situation Reports.

CLOSE-OUT DUTIES AND RESPONSIBILITIES

1. Responsible for the completion and documentation of all duties and activities required to bring the deployment to closure and to redeploy.

2. Assist in documenting all communications assets required to support the FRMAC activities while under U.S. Environmental Protection Agency (EPA) management.

3. Ensure a smooth and seamless transition of the FRMAC communications capabilities from the management of DOE to the management of EPA.

4. Responsible for retrieving and securing all communications equipment redeploying from the field.

5. Responsible for the containerization, transportation, storage, and/or redeployment of all communications equipment

COMMUNICATIONS SPECIALIST

6. Function as a courier for STU III telephones

7. Ensure that the Crypto Ignition Keys are secure and accountable

8. Assist in the containerization, storage, and/or redeployment of all FRMAC equipment and DOE sensitive assets.

9. Responsible for the disposition of all self-generated notes, logs, and mission related documentation as instructed.

10. Document lessons learned.

ORGANIZATION AND COMMUNICATIONS:

RECEIVES DIRECTION FROM:

Operations Manager and Deputy

PROVIDES DIRECTION TO:

The lead communications specialist provides scheduling and direction to the other communications specialists to establish and maintain the required communications capabilities and to accomplish the communications support activities.

QUALIFICATIONS:

- Q Security Clearance
- Cyrptographic Clearance
- Demonstrated expertise on all communications assets including encoded radios, repeaters, telephones, deployed satellite communications system, common carrier, and secure communications equipment.
- Detailed knowledge and experience with all applicable DOE, NTIA, and OSHA communications orders, rules, and regulations.
- Successfully completed the CM Training courses identified on position training template.
- Familiarity with safety issues such as Fall Protection, Electrical Safety, Confined Space, and Lock Out/Tag Out.
- Deployment Authorization Program qualified.

DOCUMENT CONTROL SPECIALIST

POSITION SUMMARY:

The Document Control Specialist will document and track the status of all CM/FRMAC requests, priorities and activities for CM/FRMAC support. In addition, the Document Control Specialist is responsible for ensuring that all CM/FRMAC documented activities, including: correspondence, Situation Reports, action requests, lessons learned, and other pertinent information is archived in an accountable, secure, and retrievable form. The Document Control Specialist will also assist with the badging of people entering the FRMAC using the Emergency Response Data System (ERDS) badging software.

DUTIES AND RESPONSIBILITIES:

PREACTIVATION DUTIES AND RESPONSIBILITIES

1. Maintain in depth expertise and experience with the Emergency Response Data System (ERDS).

2. Maintain understanding and familiarity with the CM/FRMAC data flow.

3. Maintain understanding and familiarity with the process for initiating CM/FRMAC activities and assigning priorities.

4. Maintain currency in required CMRT training classes as identified on the training template for this position.

5. Maintain currency on the courses listed on the Consequence Management Training template for this position.

6. Maintain familiarity with RSL Alert, Activation, and Deployment policies, procedures, and activities

7. Maintain Deployment Authorization Program status including: annual physical, immunizations and medical clearance, and U.S. passport.

ACTIVATION DUTIES AND RESPONSIBILITIES

1. Document and track the status of all CM/FRMAC requests (including those for support resources and data products), priorities and activities.

2. Maintain status board of all requests, actions, and priorities.

12/27/2005

DOCUMENT CONTROL SPECIALIST

3. Responsible for ensuring that all CM/FRMAC documented activities, correspondence, Situation Reports, action requests, lessons learned, and other pertinent information are archived in an accountable, secure, and retrievable form.

4. Assist with badging of FRMAC members, as required.

CLOSE-OUT DUTIES AND RESPONSIBILITIES

1. Responsible for the completion of all documentation and tracking activities required to bring the deployment to closure.

2. As requested, prepare documentation of activities.

3. Per instructions, archive all documentation.

4. Responsible for retrieving and securing all communications equipment redeploying from the field.

5. Per instructions, responsible for the disposition of all self-generated notes, logs, and mission related documentation.

6. Provide close-out documentation as required.

7. Upon deactivation, assist in the containerization and preparation for the redeployment and transportation of CMRT equipment.

8. Document lessons learned.

ORGANIZATION AND COMMUNICATIONS:

RECEIVES DIRECTION FROM:
FRMAC Director and Deputy
Operations Manager and Deputy
Monitoring Manager.

PROVIDES DIRECTION TO:
N/A.

QUALIFICATIONS:

- Q Security Clearance
- Successfully complete the CM Training courses identified on position training template.
- Maintain Deployment Authorization Program status including: annual physical, immunizations and medical clearance, and U.S. passport.

EMERGENCY RESPONSE DATABASE SPECIALIST (ERDS)

POSITION SUMMARY:

The CM Database Specialist is a computer programmer who assists in the setup and operation of the deployed Emergency Response Data System (ERDS). The Database Specialist performs data entry tasks and assists in the data management of all field monitoring and radioanalytically derived data and appropriate incident related information. He/she assists in developing requested data and informational reports and establishes communication interfaces with GIS and other on-scene emergency response organizations. In addition, the Database Specialist assists in date and time stamping, cataloging, and archiving all original CM and FRMAC documents relating to the CM/FRMAC response, data, data products, any parameters effecting the quality or integrity of the data or data products, and any other related data forms and/or information. He/she will also assist with setting up and maintaining the operation of the ERDS badging system.

DUTIES AND RESPONSIBILITIES:

PREACTIVATION DUTIES AND RESPONSIBILITIES

1. Maintain in depth knowledge, experience, and expertise with the ERDS and the associated computer hardware.

2. Upon activation, assist in the containerization and preparation for the deployment and transportation of all ERDS-related computers and equipment for deployment.

3. Maintain familiarity with Remote Sensing Laboratory (RSL) Alert, Activation, and Deployment policies, procedures, and activities.

4. Maintain a working knowledge and understanding of CM mission, capabilities, objectives, and procedures.

5. Maintain currency in required CM training classes as identified on the training template for this position.

6. Maintain Deployment Authorization Program status including: annual physical, immunizations and medical clearance, and U.S. passport

ACTIVATION DUTIES AND RESPONSIBILITIES

1. Setup ERDS computers and equipment and initialize software, including the badging system.

12/27/2005

EMERGENCY RESPONSE DATABASE SPECIALIST (ERDS)

2. Establish interfaces with GIS and other on scene emergency response organizations as required.

3. Enter any initial data relating to field monitoring instrumentation, vehicles, personnel, team composition, work shifts into ERDS.

4. Perform data entry and data management of all CM field monitoring and derived radioanalytical data, source-term information, onsite radiological situation information, and other incident related information required by the ERDS Data Center application.

5. Assist in ensuring and maintaining the technical integrity of all CM data and data products.

6. Assist in the date and time stamping, cataloging, and archiving of all original CM documents relating to the response, data, data products, any parameters effecting the quality or integrity of the their data or data products, and any other related data forms and/or information.

7. Manage the event log, and data tracking system.

8. Produce pre-defined reports as requested.

9. Interact with GIS to transfer the desired data sets from the Data Center to GIS.

10. Assist the Data Center Supervisor in the managing the Data Center.

CLOSE-OUT DUTIES AND RESPONSIBILITIES

1. Responsible for the completion of all database related duties and activities required to bring the deployment to closure and to redeploy.

2. As directed, assist in the transfer of Data Center records to other design agencies.

3. Provide data reports for incident final report and other documentation and data assessments as requested.

4. Assist in ensuring the integrity, packaging, and proper deposition of all archived original hard copies of CM documents relating to the CM response, data, data products, any parameters effecting the quality or integrity of their data or data products, and any other related data forms and/or information.

5. Upon deactivation, assist in the containerization and preparation for the redeployment and transportation of all ERDS related computers and equipment.

FIELD TEAM SPECIALIST
Phase I, Phase II, and Phase III

CLOSE-OUT DUTIES AND RESPONSIBILITIES

1. Responsible for the completion of all monitoring, sampling, health physics support, and contamination control duties and activities required to bring the deployment to closure and to redeploy.

2. Prepare documentation of monitoring, sampling, health physics, and training activities as requested.

3. Per instructions, archive all CM/FRMAC monitoring, sampling, health physics, chain-of-custody, and quality control/assurance forms.

4. Per instructions, responsible for the disposition of all self-generated notes, logs, and mission related documentation

5. Upon deactivation, assist in the containerization and preparation for the redeployment and transportation of all CM/FRMAC equipment.

6. Document lessons learned.

ORGANIZATION AND COMMUNICATIONS:

RECEIVES DIRECTION FROM:

FRMAC Director
Operations Manager
Monitoring Manager and Deputy

PROVIDES DIRECTION TO:

N/A

QUALIFICATIONS:

- "Q" security clearance.
- Successfully completed the Occupational Safety and Health Act 40-hour Hazardous Waste Operations and Emergency Response Course (OSHA Title 29 CFR 1910.120) and the annual refresher course.
- CPR Certified
- DOE Rad Worker II Certified
- Full Face Respirator Certified
- Certified in the use of personnel protective equipment to include self-contained breathing apparatus and Level A and B protective clothing.
- Demonstrated detailed knowledge and experience with all phases of Consequence Management radiological monitoring and sampling techniques and methodologies.

FIELD TEAM SPECIALIST

POSITION SUMMARY:

The Field Team Specialist executes radiological field monitoring and environmental sampling duties according to established and documented CM/FRMAC methodologies in a safe, consistent, efficient, and timely manner. The Field Team Specialist may also escort first responders into potentially contaminated areas requiring personal protective equipment (PPE) up to and including Level A and self-contained breathing apparatus (SCBA) for lifesaving and/or forensic operations. In addition, the Field Team Specialist may be requested to provide training to local responders in field monitoring, sampling, and/or contamination control procedures

DUTIES AND RESPONSIBILITIES:

PREACTIVATION DUTIES AND RESPONSIBILITIES

1. Maintain detailed knowledge and expertise with a broad spectrum of radiological field monitoring and health physics instrumentation including Field Instruments for the Detection of Low Energy Radiation (FIDLERs), Violinists, and *In-situ* high resolution gamma spectroscopy

2. Maintain detailed knowledge, expertise, and proficiency with all phases of radiological monitoring techniques and environmental sampling methodologies as identified in the FRMAC *Monitoring Division Manual*, Volume 2, - *Radiation Monitoring and Sampling.*

3. Maintain knowledge and familiarity with the FRMAC *Health and Safety Manual.*

4. Maintain knowledge and experience with radiological contamination control and decontamination procedures.

5. Maintain currency in required CM training classes as identified on the training template for this position.

6. Maintain currency on the Occupational Safety and Health Act 40-hour Hazardous Waste Operations and Emergency Response Course (OSHA Title 29 CFR 1910.120).

7. Maintain DOE Rad Worker II Certification.

8. Maintain Full Face Respirator Certification.

9. Maintain currency on personnel protective equipment to include self-contained breathing apparatus and Level A and B protective clothing.

12/27/2005

FIELD TEAM SPECIALIST

10. Maintain CPR certification.

11. Maintain a working knowledge and understanding of CM/FRMAC missions, capabilities, objectives, and procedures

12. Maintain familiarity with RSL Alert, Activation, and Deployment policies, procedures, and activities

13. Maintain Deployment Authorization Program status including: annual physical, immunizations and medical clearance, and U.S. passport.

ACTIVATION DUTIES AND RESPONSIBILITIES

1. Ensure that the principle of "As Low As Reasonably Achievable" (ALARA) is practiced during all possible radiation exposures.

2. Perform radiological field monitoring and environmental sampling duties.

3. Escort emergency workers into potentially contaminated areas for lifesaving and/or forensic operations.

4. Perform quality control procedures and complete related documentation on all radiological monitoring instruments in use.

5. Provide training to local responders in field monitoring, sampling, and/or contamination control procedures, as requested.

6. Maintain accurate and complete documentation of all field monitoring, sample collection, and health physics activities.

7. Maintain strict chain of custody for all collected samples and documentation.

8. Perform health physics monitoring and contamination control activities as requested.

9. Remain cognizant of contamination control procedures during all monitoring and sample collection and handling activities.

10. If the emergency response transitions into a FRMAC, this position may transition into the FRMAC Assessment Division.

FIELD TEAM SPECIALIST

CLOSE-OUT DUTIES AND RESPONSIBILITIES

1. Responsible for the completion of all monitoring, sampling, health physics support, and contamination control duties and activities required to bring the deployment to closure and to redeploy.

2. Prepare documentation of monitoring, sampling, health physics, and training activities as requested.

3. Per instructions, archive all CM/FRMAC monitoring, sampling, health physics, chain-of-custody, and quality control/assurance forms.

4. Per instructions, responsible for the disposition of all self-generated notes, logs, and mission related documentation

5. Upon deactivation, assist in the containerization and preparation for the redeployment and transportation of all CM/FRMAC equipment.

6. Document lessons learned.

ORGANIZATION AND COMMUNICATIONS:

RECEIVES DIRECTION FROM:

FRMAC Director
Operations Manager
Monitoring Manager and Deputy

PROVIDES DIRECTION TO:

N/A

QUALIFICATIONS:

- "Q" security clearance.
- Successfully completed the Occupational Safety and Health Act 40-hour Hazardous Waste Operations and Emergency Response Course (OSHA Title 29 CFR 1910.120) and the annual refresher course.
- CPR Certified
- DOE Rad Worker II Certified
- Full Face Respirator Certified
- Certified in the use of personnel protective equipment to include self-contained breathing apparatus and Level A and B protective clothing.
- Demonstrated detailed knowledge and experience with all phases of Consequence Management radiological monitoring and sampling techniques and methodologies.

GIS SCIENTIST

POSITION SUMMARY:

The Geographic Information System (GIS) Scientist works with the Assessment Scientist to generate map data products for use by the on-scene decision makers at the site. The GIS Scientist also downloads updated data from the National Atmospheric Release Advisory Capability (NARAC), Aerial Measuring System (AMS) B-200 flight data, and data from field monitoring teams that illustrate the various locations where sampling activities have taken place.

DUTIES AND RESPONSIBILITIES:

PREACTIVATION DUTIES AND RESPONSIBILITIES

1. Maintain detailed knowledge, experience, and thorough understanding of Consequence Management missions, capabilities, and objectives.

2. Maintain knowledge and experience of NARAC and Aerial Measuring System (AMS) data types.

3. Maintain in depth knowledge, experience, and familiarity with the GIS hardware and software.

4. Maintain proficiency in creating various emergency response GIS data products.

5. Upon activation, assists in the containerization and preparation for the deployment and transportation of all GIS equipment that is to be deployed.

6. Maintain currency on the courses listed on the Consequence Management Training template for this position.

7. Maintain familiarity with RSL Alert, Activation, and Deployment policies, procedures, and activities.

8. Maintain Deployment Authorization Program status including: annual physical, immunizations and medical clearance, and U.S. passport.

ACTIVATION DUTIES AND RESPONSIBILITIES

1. Setup and operate the emergency response GIS equipment.

2. Produce GIS data products as requested.

3. Import NARAC model prediction information and produce data products as required.

GIS SCIENTIST

4. Provide GIS data products to the NNSA/NSO, NNSA/HQ, Emergency Operations Support Center at the RSL, and other ECN Centers via the ECN.

CLOSE-OUT DUTIES AND RESPONSIBILITIES

1. Assist the Assessment Manager in ensuring a smooth and seamless transition of appropriate GIS maps, records, data, information, etc. to the U.S. Environmental Protection Agency (EPA) when the management transitions from DOE to EPA.

2. Provide GIS data products for incident final report and other documentation as requested.

3. Archive GIS data products.

4. Responsible for the disposition of all self-generated notes, logs, and mission-related documentation, as instructed.

5. Responsible for the accountability and the containerization, transportation, storage, and/or redeployment of all GIS equipment.

6. Document lessons learned.

ORGANIZATION AND COMMUNICATIONS:

RECEIVES DIRECTION FROM:

FRMAC Director
Operations Manager
Assessment Manager

PROVIDES DIRECTION TO:

The senior GIS Scientist functions as the GIS Group's Supervisor in the field. He/she provides scheduling and direction to the other GIS Scientist to establish GIS priorities and ensure accurate, timely, and appropriate GIS data products.

QUALIFICATIONS:

- "Q" Security Clearance.
- Knowledge and experience in emergency response GIS activities and methodologies.
- Expertise in the setup and operations of the Emergency Response GIS systems.
- Successful completion of CM Training courses identified on position training template.
- Deployment Authorization Program qualified.

12/27/2005

IN-SITU SCIENTIST

POSITION SUMMARY:

The In Situ Scientist is the senior technician who collects spectral information of radiological deposition. The person in this position will also assist with field monitoring duties.

DUTIES AND RESPONSIBILITIES:

PREACTIVATION DUTIES AND RESPONSIBILITIES

1. Maintain detailed knowledge, experience, and thorough understanding of CM/FRMAC missions, capabilities, and objectives.

2. Maintain detailed knowledge, expertise, and proficiency with all phases of AMS radiological monitoring techniques and methodologies including activities and the comparability of data associated with:

    - Aerial radiation surveys and radioactive source searches.
    - Real-time radiological aerial atmospheric tracking and sampling.
    - Ground-based vehicle (Kiwi) radiation surveys and radioactive source search capabilities.
    - *In situ* gamma spectroscopy.

3. Maintain detailed knowledge and expertise with a broad spectrum of radiological field monitoring and health physics instrumentation including Field Instruments for the Detection of Low Energy Radiation (FIDLERs), Violinists, and *in situ*, high resolution gamma spectroscopy systems.

4. Maintain knowledge and familiarity with the FRMAC *Monitoring Division Manual, Vols. 1 and 2* and the FRMAC *Health and Safety Manual.*

5. Maintain currency on the courses listed on the Consequence Management Training template for this position.

6. Maintain DOE Rad Worker II Certification.

7. Maintain Full Face Respirator Certification.

8. Maintain currency on personnel protective equipment to include Level B protective clothing.

9. Maintain CPR certification.

12/27/2005

IN-SITU SCIENTIST

10. Maintain familiarity with RSL Alert, Activation, and Deployment policies, procedures, and activities.

11. Maintain Deployment Authorization Program status including: annual physical, immunizations and medical clearance, and U.S. passport.

ACTIVATION DUTIES AND RESPONSIBILITIES

1. Ensure that the principle of "As Low As Reasonably Achievable" (ALARA) is practiced during all possible radiation exposures.

2. Acquire in situ gamma spectral data as required.

3. Perform in situ gamma spectral data reduction to provide the desired data interpretations that are consistent with the required data quality objectives.

4. Responsible for the quality control procedures and related documentation on all in situ gamma spectroscopy systems and other radiological monitoring instruments in use.

5. Maintain accurate and complete documentation of all field monitoring, sample collection, and health physics activities.

6. Maintain strict chain-of-custody for all gamma spectral data, collected samples and in situ gamma spectroscopy related documentation.

7. Responsible for adherence to all health physics monitoring and contamination control activities as applicable to the in situ gamma spectroscopy missions.

8. Cognizant of contamination control procedures during all monitoring and sample collection and handling activities associated with the in situ gamma spectroscopy missions.

CLOSE-OUT DUTIES AND RESPONSIBILITIES

1. Responsible for the completion of all in situ gamma spectroscopy related activities and related contamination/decontamination efforts required to bring the deployment to closure and to redeploy.

2. Prepare documentation of in situ gamma spectroscopy activities as requested.

3. Archive all in situ gamma spectra and related data as requested.

4. Responsible for the disposition of all self-generated notes, logs, and mission related documentation as instructed.

IN-SITU SCIENTIST

5. Responsible for the preparation for redeployment, containerization, and transportation of all in situ gamma spectroscopy systems and related instrumentation and equipment.

6. Document the chronology of significant events, meetings, and activities.

7. Provide data interpretations and mission descriptions for preparation of deployment related reports.

8. Provide close-out documentation as required.

9. Document lessons learned.

ORGANIZATION AND COMMUNICATIONS:

RECEIVES DIRECTION FROM:

CM/FRMAC Director
Monitoring Manager

PROVIDES DIRECTION TO:

N/A

QUALIFICATIONS:

- DOE Rad Worker II Certified
- Full Face Respirator Certified
- Certified in the use of personnel protective equipment to include Level B protective clothing.
- Detailed knowledge, expertise, and proficiency with all phases of AMS radiological monitoring techniques and methodologies including activities associated with: Aerial radiation surveys and radioactive source searches
- Real-time radiological aerial atmospheric tracking and sampling
- Ground-based vehicle (Kiwi) radiation surveys and radioactive source search capabilities
- Detailed knowledge and expertise with a broad spectrum of radiological field monitoring and health physics instrumentation including FIDLERs, Violinists, and in situ high resolution gamma spectroscopy systems
- Successfully completed the following FRMAC Training courses:
- FRMAC Field Monitoring
- In Situ Gamma-ray Spectroscopy
- Deployment Authorization Program qualified.

MECHANICAL/ELECTRICAL SPECIALIST

POSITION SUMMARY:

The CM/FRMAC Mechanical, Electrical Specialist provides mechanical, electrical, and engineering support to the CM/FRMAC. Required support includes establishing the operating facility which may require setting up large tents and ensuring satisfactory electrical power, heating, and air conditioning services are available to sustain operations. The Mechanical/Electrical group also provides electrical generators and power sources for equipment and mobile laboratories, electrical/mechanical repair and field fabrication support, and forklifts and other loading/unloading equipment.

DUTIES AND RESPONSIBILITIES:

PREACTIVATION DUTIES AND RESPONSIBILITIES

1. Maintain working knowledge of general mechanical/electrical operations as they apply to the CM/FRMAC.

2. Maintain familiarity with the various mechanical equipment and electrical generators maintained at the Remote Sensing Laboratory (RSL).

3. Maintain certification to operate forklifts, loading/unloading equipment, and other related heavy equipment.

4. Maintain experience and familiarity with the various tents that are in the RSL's inventory and their sizes, uses, and assembly/disassembly.

5. Maintain detailed knowledge and familiarity with all applicable DOE, Occupational Safety and Health Administration (OSHA), Department of Transportation (DOT), and Bechtel Nevada rules, regulations, and orders.

6. Maintain a working knowledge and understanding of ARG/CMRT II/SAT/FRMAC missions, capabilities, objectives, and procedures.

7. Maintain familiarity with RSL Alert, Activation, and Deployment policies, procedures, and activities.

8. Maintain Deployment Authorization Program status including: annual physical, immunizations and medical clearance, and U.S. passport.

MECHANICAL/ELECTRICAL SPECIALIST

ACTIVATION DUTIES AND RESPONSIBILITIES

1. Provide mechanical, electrical, and engineering support to establish operations as needed.

2. Assist in the assembly/disassembly of all on-scene required tents to support the CMRT/FRMAC. These tents may be used for the operations facility, sample control facility, monitoring team dispatch facility, equipment storage, etc.

3. Assist in ensuring satisfactory electrical power is available to sustain operations including the mobile laboratories collocated with the deployed organization.

4. Operate and maintain on-scene electrical generators (3 kw - 90 kw) and power sources for equipment.

5. Perform mechanical/electrical repair and field fabrication support as required.

6. Operate forklifts, loading/unloading equipment, and other heavy equipment as required.

7. Provide and maintain required heating and air conditioning.

8. Obtain equipment, materials, supplies, and services as required by the operations.

9. Prepare and load equipment for transportation.

10. Obtain and/or provide transportation for personnel and equipment.

CLOSE-OUT DUTIES AND RESPONSIBILITIES

1. Provide mechanical/electrical support for the termination and redeployment of operations.

2. Prepare for shipping and containerize, as needed, all mechanical/electrical support equipment.

3. Assist in the disassembly, containerization, transportation, storage, and/or redeployment of all deployed CM/FRMAC equipment.

4. Assist in the containerization, storage, and/or redeployment of all RSL equipment and DOE sensitive assets.

5. Per instructions, responsible for the disposition of all self-generated notes, logs, and mission related documentation.

6. Document lessons learned.

12/27/2005

MECHANICAL/ELECTRICAL SPECIALIST

ORGANIZATION AND COMMUNICATIONS:

RECEIVES DIRECTION FROM:

CM/FRMAC Director and Deputy
Operations Manager and Deputy

PROVIDES DIRECTION TO:

N/A

QUALIFICATIONS:

- Q Security Clearance.
- Successfully complete the CM Training courses identified on position training template.
- In depth knowledge and experience in emergency response field operations from the electrical/mechanical/logistical perspective.
- Certified to operate fork lifts, loading/unloading equipment, and other related heavy equipment.
- Detailed knowledge and familiarity with all applicable DOE, OSHA, DOT, and Bechtel Nevada rules, regulations, and orders.
- Deployment Authorization Qualified (including passport, physical, and immunizations).

12/27/2005

SAMPLE CONTROL TECHNICIAN

POSITION SUMMARY:

The Sample Control Technician is responsible for receiving, inspecting, logging, and preparing for shipment samples that have been collected and screened by hot line personnel.

DUTIES AND RESPONSIBILITIES:

PREACTIVATION DUTIES AND RESPONSIBILITIES

1. Maintain currency and expertise on all applicable DOE Orders, OSHA standards, other Federal regulations, and FRMAC documents.

2. Maintain expert working knowledge and experience in hotline processes/procedures and contamination control.

3. Maintain general knowledge and familiarity in the areas of industrial hygiene and occupational safety.

4. Maintain knowledge and experience in the handling, packaging, storing, and shipping of hazardous materials, radioactive substances, and mixed waste.

5. Maintain knowledge and familiarity with the FRMAC *Health and Safety Manual* and the *Laboratory Analysis Manual*.

6. Maintain a general working knowledge and understanding of CM missions, capabilities, objectives, and procedures.

7. Maintain currency on the courses listed on the Consequence Management Training template for this position.

8. Maintain familiarity with RSL Alert, Activation, and Deployment policies, procedures, and activities.

9. Maintain Deployment Authorization Program status including: annual physical, immunizations and medical clearance, and U.S. passport.

ACTIVATION DUTIES AND RESPONSIBILITIES

1. Receive samples that have been screened for contamination by hot line personnel.

2. Review, validate, and sign chain of custody documentation.

3. Inspect samples.

SAMPLE CONTROL TECHNICIAN

4. Log samples into sample tracking system.

5. Record sample tracking information.

6. Prepare samples for shipment and include shipping documentation.

CLOSE-OUT DUTIES AND RESPONSIBILITIES

1. Responsible for the completion and documentation of all duties and activities required to bring the deployment to closure and to redeploy.

2. Ensure all handling, packaging, storing, and shipping of hazardous materials, radioactive substances, and mixed waste are in compliance with all applicable DOE Orders, OSHA and DOT standards, and federal regulations.

3. Responsible for the adherence to all applicable DOE Orders, Occupational Safety and Health Association (OSHA) standards, DOS regulations, and other federal regulations for transitioning the CMRT site to the receiving authority.

4. Responsible for the disposition of all self-generated notes, logs, and mission related documentation as instructed.

5. Document lessons learned.

ORGANIZATION AND COMMUNICATIONS:

RECEIVES DIRECTION FROM:

CM/FRMAC Director and Deputy
Operations Manager and Deputy
Laboratory Analysis Manager

PROVIDES DIRECTION TO:

Sample collectors turning in samples

QUALIFICATIONS:

- Q Security Clearance
- Recognized expert in the field of collection and processing of environmental samples for analysis for radioactivity.
- General knowledge and experience in the areas of industrial hygiene and occupational safety.
- Detailed knowledge and experience with all applicable DOE Orders, OSHA Standards, and other federal regulations.

G.21 Other Key Personnel in the FRMAC Facilities

Other key personnel expected to be located in the FRMAC facilities, but who are not a part of the FRMAC operations, are described below.

G.21.1 Representatives from Other Agencies to the FRMAC

Federal agencies that need information to fulfill their statutory and/or regulatory obligations are represented at the FRMAC but are not part of the FRMAC operations. These agency representatives act as information channels to and from their headquarters. They cannot, however, send radiological data to their headquarters without Coordinating Agency approval and until approved by the FRMAC Director. Other local agencies within the state(s), including utilities, may also be represented.

G.21.2 Advisory Team

Although the Advisory Team is not part of the FRMAC, it is co-located with the FRMAC. The Advisory Team for Environment, Food, and Health, composed of representatives from the U.S. Environmental Protection Agency, U.S. Department of Agriculture, and U.S. Department of Health and Human Services, provides direct support to the Coordinating Agency in evaluating and recommending protective actions.

G.22 Home Team Support

Home Teams are staffed at the National Laboratories and the Remote Sensing Laboratory in support of fielded CM teams. In addition to logistics support, Home Teams provide various types of technical support:

- Provide Automated Consequence Report for Insidious Dispersal (ACRID) or NARAC effects models to field team as soon as the field team arrives on-scene allowing very early initial assessment of the situation.
- Can run Turbo FRMAC calculations and provide results to field Assessment Scientists early in the event.
- Provide early map and GIS location information to the field teams.
- Perform effects and prediction models run in parallel with the fielded team to confirm field team results and evaluate additional scenarios in support of field team efforts.
- Provide the fielded CMRT with weather data related to the event site in the event that web access is not available, or if better information is available.
- Home Team Assessment Scientists can perform the more complex/involved assessment calculations supporting the field Assessment Scientists.
- Provide technical information to Assessment Scientists to aid in out of the ordinary assessment requests.

APPENDIX H

GLOSSARY

Aerial Measuring System	An airborne system used to detect, locate, and measure low levels of airborne radiation. In addition to multi-spectral sensing capabilities and instrumentation for determining geodetic positions, the system can acquire aerial photography.
Airborne Radioactive Material	Radioactive material dispersed in air. Airborne radioactive material may include colloidal suspensions, windblown dust, fumes, mists, vapors, gases or any other airborne media.
Assessment	Evaluation and interpretation of information to develop a basis for making decisions; for example, an evaluation of radiometric data that may include dose estimates and recommendations for protective actions to minimize harmful effects from radiation.
Contamination	A condition that exists when an unwanted material has spread to previously unaffected areas at levels that may be harmful to public health and the environment or interfere with various measurements.
Coordinating Agency (formerly Lead Federal Agency)	The Federal agency that owns, authorizes, regulates, or is otherwise responsible for managing deployment of personnel and response to an emergency with the authority to take whatever action is necessary to stabilize the situation.
Deposition	The accumulation of (radioactive) material on unprotected surfaces of plants, structures, soil, or the bottom of ponds, streams, etc., from airborne release(s).
Dosimeter	An instrument for measuring the accumulated or total dose from exposure to ionizing radiation.
Emergency Operations Center (EOC)	The center from which emergency response personnel and teams receive field instructions and directions during emergency situations. Emergency Operations Centers are usually staffed and operated by state and local personnel.
Emergency Operations Facility (EOF)	A licensee-controlled and operated support center for management of emergency response, coordination of radiological and environmental assessments, development of recommended public protective actions, and coordination of emergency response with Federal, state, and local areas.

Evacuation	The process of removing people from a hazardous area to a safe area. As used here, evacuation refers to removal of a population for a short period (not more than a few days), and relocation refers to removal for longer periods.
Federal (organizations)	Agencies, departments, or other entities of the Federal government.
Federal Radiological Monitoring and Assessment Center (FRMAC)	A center in the vicinity of a radiological incident that coordinates the Federal radiological monitoring and assessment response to an incident that threatens the health or well being of affected populations. The center, which operates at offsite locations in the affected state(s) or tribal area(s), does not generally need to be located near the emergency operations centers (EOC), as long as operations involving the Coordinating Agency, FRMAC and local entities can be coordinated. The Coordinating Agency has overall responsibility for coordination and/or operation of the incident.
Joint Field Office (JFO)	A temporary Federal facility established locally to provide a central point for Federal, State, local, and tribal executives with responsibility for incident oversight, direction, and/or assistance to effectively coordinate protection, prevention, preparedness, response, and recovery actions. The JFO will combine the traditional functions of the JOC, the FEMA DFO, and the JIC within a single Federal facility.
Joint Information Center (JIC)	The JIC serves as a focal point for the coordination and dissemination of information to the public and media concerning incident prevention, preparedness, response, recovery, and mitigation.
Local (organization)	The local government agency or office having the principal or lead role in emergency planning and preparedness. Generally this will be a county government. Other local government entities; *e.g.*, towns, cities, municipalities, tribe, etc., are considered to be sub organizations with supportive roles to the principal or lead local government organization responsible for emergency planning and preparedness. In some cases, there will be more than one lead organization at the local level. One designated lead organization is preferable.
Monitoring	Continuing collection of data to assess information, determine adequacy of radiation protection practices and to identify potentially significant changes in conditions or radiation protection.
National Response Plan (NRP)	An all-discipline, all-hazards plan that establishes a single, comprehensive framework for the management of domestic incidents. It provides the structure and mechanisms for the coordination of Federal support to State, local, and tribal incident managers and for exercising direct Federal authorities and responsibilities. (Replaces the Federal Response Plan.).
Nuclear/Radiological Incident Annex (to the National Response Plan)	The Nuc / Rad Annex to the National Response Plan provides an organized and integrated capability for a timely, coordinated response by Federal agencies to terrorist incidents involving nuclear or radioactive materials (Incidents of National Significance), and accidents or incidents involving such material that may or may not rise to the level of an Incident of National

	Significance. (Replaces the FRERP).
Offsite	The area outside the boundary of a site or facility, but within the area of influence.
Offsite Federal Support	The Federal role assisting during mitigation of offsite consequences during an emergency and protection of public health and safety, including assistance identifying and implementing measures to protect public health.
Onsite	Area within the boundary of a site or facility established by the owner or operator, a transporter or the Coordinating Agency of the affected facility for administrative control during an emergency. Specifically, the onsite area includes everything within the boundary of a nuclear power plant, a DoD installation, a DOE facility, a National Defense Area, or a National Security Area. It also includes the controlled area surrounding a radioactive spill in a transportation incident. In the event of a terrorist event, "on-site" would be defined as the area where the Incident Commander defined a perimeter to identify the crime scene or area where dangers may still exist. Once the initial criminal and forensic investigation is completed, the "on-site" boundary would be lifted and the state or local authorities would assume control.
Onsite Federal Support	Assistance by a Federal agency that owns, authorizes, regulates, or is otherwise responsible for the radiological facility, material being transported, etc; *e.g.*, the Coordinating Agency. Federal support is in response to state and local assistance efforts and supports the owner or operator's efforts to manage and thereby prevent or minimize offsite consequences during an incident.
Protective Action Guide (PAG)	The projected dose to an individual from an unplanned release of radioactive material at which a specific protective action to reduce or avoid that dose is recommended.
Public Information Officer (PIO)	Representative from a Federal agency who works in cooperation with other Federal, state, and local agencies, to coordinate public releases of information during an event.
Radiation Emergency Assistance Center/Training Site (REAC/TS)	An NNSA multi-purpose medical/training facility with 24/7 national/international deployable radiological emergency response teams which is located at Oak Ridge, Tennessee, and is capable of providing medical/health physics care and consultation for all types of radiological injuries (www.orau.gov/reacts).
Radiological Assistance Program (RAP) Team	A team dispatched to the site of a radiological incident by the responding regional DOE office.
State (organization)	The state government agency or office having the principal or lead role in emergency planning and preparedness. There may be more than one state involved, resulting in separate application of evaluation criteria for the affected states. To the extent possible, however, one state should be designated as the lead.

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APPENDIX I

FRMAC MANUALS

The Federal Radiological Monitoring and Assessment Center (FRMAC) manuals have been extensively peer reviewed. As the manuals are used, FRMAC expects to receive many comments and suggestions related to their content and application. These comments and suggestions will be evaluated by the appropriate FRMAC Working Group and they will be incorporated into future revisions as suitable. Comments, suggestions, and/or requests for manuals should be addressed to:

U.S. Department of Energy
National Nuclear Security Administration
Nevada Site Office
Attn: FRMAC Program Manager
P.O. Box 98518
Las Vegas, NV 89193-8518

Information contained other in FRMAC manuals (cited below) may be valuable for reference purposes during an emergency. These manuals are available to the public on the NNSA/NSO website:

http://www.nv.doe.gov

FRMAC Assessment Manual, Vol. 1, 2, and 3, SAND2003-1071P (April 2003*)*

Provides information in methods and pre-assessed default scenarios as well as useful tables, chart, worksheets, and a glossary relevant to the work of the Assessment group.

FRMAC Health and Safety Manual, DOE/NV/11718—440 (September 2001)

The *FRMAC Health and Safety Manual* provides for radiation safety, industrial hygiene, occupational safety, and emergency medical care. The manual includes information on Radiation Exposure Guidelines, personnel dosimetry, contamination control (including limits on contamination for release of equipment to uncontrolled areas), radioactive and hazardous waste packaging, and personal protective equipment.

FRMAC Monitoring and Analysis Manual, Volumes 1 (April 2004) and 2 (old Volume 1, September 2002)

FRMAC Monitoring Division Manual, Volume 1,

FRMAC Monitoring Division Manual, Volume 2, "Radiation Monitoring and Sampling," describes the procedures employed by FRMAC field teams in performing radiological monitoring and sampling activities provides guidance for radiochemical analysis of samples collected during a radiological emergency.

FRMAC Laboratory Analysis (May 2004)

The *FRMAC Laboratory Analysis Manual* provides guidance for radiochemical analysis of samples collected during a radiological emergency to provide scientifically defensible data of acceptable quality.

Upcoming Manuals:

Overview of FRMAC Operations

The *Overview of FRMAC Operations* is in the process of being re-written to be published as a pamphlet. It will provide a concise overview of the FRMAC phased-response concept with a listing of the signatory agencies.

APPENDIX J

KEY REFERENCE DOCUMENTS

Primary Federal Plan

The National Response Plan (NRP), U.S. Department of Homeland Security, December 2004

Supporting Federal Statutes, Orders, Regulations, and Plans

Atomic Energy Act of 1954, amended, Public Law 83-703

Department of Energy Organization Act, U.S. Codes, Congressional and Administrative News, 95th Congress, First Session, 1977

Homeland Security Presidential Directive (HSPD-5)

Interagency Radiological Assistance Plan, April 1975

Radiation Control for Health and Safety Act, Public Law 90-602 (Subpart 3 of Title 42 USC 241)

Robert T. Stafford Disaster Relief and Emergency Assistance Act, Public Law 93-288, May 22, 1974

Nuclear/Radiological Incident Annex to the NRP, U.S. Department of Homeland Security December 2004

Title 10 CFR 835, "Occupational Radiation Protection," December 14, 1993, Revised January 1, 2003

Title 29 CFR 1910, "Occupational Safety and Health Standards," Subpart 1910.120, "Hazardous Waste Operations and Emergency Response." Revised July 1, 2003

Title 44 CFR, "Emergency Management and Assistance," October 1, 1992, Revised: October 1, 2001

Title 44 CFR, "Radiological Emergency Planning and Preparedness," October 1, 1992, Revised October 1, 2001.

Executive Orders

Executive Order 13286, February 28, 2003 (Amendment of Executive Orders, and other actions, in connection with the transfer of certain functions to the Secretary of Homeland Security). Amends, among others, EO 12919, June 3, 1994; EO 12656, November 18, 1988; EO 12148, July 20, 1979.

Executive Order 12656, "Assignment of Emergency Preparedness Responsibilities," November 18, 1988.

Executive Order 12241, "National Contingency Plan," September 29, 1980.

Executive Order 12196, "Operational Safety and Health Programs for Federal Employers," February 26, 1980.

Executive Order 12148, "Federal Emergency Management," July 20, 1979

DOE Orders

DOE Order 151.1A, "Comprehensive Emergency Management System," November 1, 2000.

DOE Order 5400.1, "General Environmental Protection Program," November 9, 1988.

DOE Order 5400.5, "Radiation Protection of the Public and the Environment," February 8, 1990, and Change 1, June 5, 1990, and Change 2, January 7, 1993.

DOE Order 5500.1B, "Emergency Management System," April 30, 1991, and Change 1, February 27, 1992.

DOE Order 5500.3A, "Planning and Preparedness for Operational Emergencies," April 30, 1991, and Change 1, February 27, 1992.

DOE Order 5500.10, "Emergency Readiness Assurance Program," April 30, 1990, and Change 1, February 27, 1992.

DOE Order 5530.1A, "Accident Response Group," September 20, 1991.

DOE Order 5530.2, "Nuclear Emergency Search Team," September 20, 1991.

DOE Order 5530.3, "Radiological Assistance Program," January 14, 1992, and Change 1, April 10, 1992.

DOE Order 5530.4, "Aerial Measuring System," September 20, 1991.

DOE Order 5530.5, "Federal Radiological Monitoring and Assessment Center," July 10, 1992, and Change 1, December 12, 1992.

DOE/NV Order 5500.4A, "Public Affairs Policy and Planning Requirements for Emergencies," June 8, 1992.

Other Federal Agency Documents

Assistant to the Secretary of Defense. *Nuclear Weapon Accident Response Procedures (NARP) Manual*, DoD 5100.52-M, September 1990; Defense Nuclear Agency, Alexandria, VA.

McKenna, T. *et al*. *RTM-96 Response Technical Manual*, NUREG/BR-0150, Vol. 1, Rev. 4, March 1966; Nuclear Regulatory Commission, Division of Operational Assessment, Office for Analysis and Evaluation of Operational Data.

Nevada Test Site Radiological Emergency Response Plan for a Prompt Massive Venting Following an Underground Nuclear Test, DOE/NV, Nevada Test Organization Interface Plan. Rev. 2.2, May 1993; Las Vegas, NV.

Nuclear Regulatory Commission Appropriation Authorization, Public Law 96-295, Section 304, June 30, 1980.

U.S. Department of Health and Human Services/U.S. Food and Drug Administration. *Accidental Radioactive Contamination of Human Food and Animal Feeds,* August 13, 1998. Electronic version available at: www.fda.gov/cdrh/dmqrp/84.html. Accessed: March 31, 2004.

U.S. Environmental Protection Agency. *EPA Manual of Protective Action Guides and Protective Actions for Nuclear Incidents*, May 1992. Electronic version available at: www.epa.gov/radiation/rert/pags.htm. Accessed: March 31, 2004.